Sandia National Laboratories

Justification for Class III Permit Modification

January 2008

SWMUs 8 And 58
Operable Unit 1332
Canyons Blast Area
Volume 1 of 4

CAC (Vols.1-3) Submitted April 2005
RSI Response Submitted March 2006
NOD Response Submitted January 2007

Environmental
Restoration
Project

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

ESH&EC

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APR 1 5 2005

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

cc: Carolyn Daniel
NL

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
Permits Management Program
2905 Rodeo Park Road East, Building 1
Santa Fe, NM 87505

Dear Mr. Bearzi:

On behalf of the Department of Energy (DOE) and Sandia Corporation, DOE is submitting the enclosed Proposal for Corrective Action Complete (CAC) for Solid Waste Management Unit 8—Open Dump (Coyote Canyon Blast Area) and Solid Waste Management Unit 58—Coyote Canyon Blast Area, Foothills Test Area at Sandia National Laboratories, New Mexico, EPA ID No. NM5890110518.

This submittal includes descriptions of the site characterization and remediation work and risk assessments for SWMUs 8 and 58. The risk assessments conclude that for these sites (except for Feature 58FF within SWMU 58): (1) there is no significant risk to human health under both the industrial and residential land-use scenarios; and (2) none of the COCs warrant ecological concern because the ecological risks were acceptable per NMED guidance.

A risk-based determination of CAC with administrative controls is recommended for Feature 58FF within SWMU 58 because lead is present in the soil at levels that exceed the EPA residential screening level.

Based on the information provided, DOE and Sandia are requesting a determination of CAC without controls for these two sites, with the exception of Feature 58FF. Following NMED CAC determinations on these sites, DOE and Sandia will propose administrative controls for Feature 58FF in a Class 3 permit modification request.

If you have any questions, please contact John Gould at (505) 845-6089.

Sincerely,

Patty Wagner

Patty Wagner
Manager

Enclosure

SANDIA NATIONAL LABORATORIES ENVIRONMENTAL RESTORATION PROJECT CORRECTIVE ACTION COMPLETE PROPOSAL SOLID WASTE MANAGEMENT UNIT 8, OPEN DUMP (COYOTE CANYON BLAST AREA) AND SOLID WASTE MANAGEMENT UNIT 58, COYOTE CANYON BLAST AREA, FOOTHILLS TEST AREA

April 2005

Volume 1 of 3

United States Department of Energy
Sandia Site Office

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TABLE OF CONTENTS

LIST OF FIGURES v
LIST OF TABLES ix
LIST OF ANNEXES xxi
ACRONYMS AND ABBREVIATIONS xxiii

1.0 SUMMARY 1-1

2.0 DESCRIPTION AND OPERATIONAL HISTORY 2-1

2.1 Site Description 2-1
2.2 Operational History 2-27
2.3 Constituents of Concern 2-27
2.4 Prior Waste Disposal/Cleanup Activities 2-30

3.0 LAND USE 3-1

3.1 Current Land Use 3-1
3.2 Future/Proposed Land Use 3-1

4.0 INVESTIGATORY ACTIVITIES 4-1

4.1 Summary 4-1
4.2 Investigation 1—CEARP 4-1

4.2.1 Nonsampling Data Collection 4-1
4.2.2 Sampling Data Collection 4-3
4.2.3 Data Gaps 4-3
4.2.4 Results and Conclusions 4-3

4.3 Investigation 2—Preliminary Investigations 4-3

4.3.1 Background Review 4-3
4.3.2 UXO/HE Survey 4-3
4.3.3 Cultural Resources Survey 4-5
4.3.4 Sensitive Species Survey 4-5
4.3.5 Radiological Surveys 4-6
4.3.6 Housekeeping and VCM Activities Prior to RFI 4-6
4.3.7 Sampling Data Collection 4-17
4.3.8 Data Gaps 4-17
4.3.9 Results and Conclusions 4-17

4.4 Investigation 3—RFI Sampling Activities 4-17

4.4.1 SWMU 8 RFI Sampling 4-17

TABLE OF CONTENTS (Continued)

4.4.1.1 Nonsampling Data Collection 4-18
4.4.1.2 SWMU 8DDD (Explosives Contaminated Area) 4-18
4.4.1.3 SWMUs 8PP and 8RR (Area of Open Burning) 4-35
4.4.1.4 SWMU 8GGG (Arroyo Area) 4-39
4.4.1.5 SWMUs 8Y and 58B (Debris Pile and Pit) 4-53
4.4.1.6 Data Gaps for SWMU 8 RFI Sampling 4-73

4.4.2 SWMU 58 RFI Sampling 4-73

4.4.2.1 Nonsampling Data Collection 4-76
4.4.2.2 SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z (SWMU 58 Test Locations Involving Detonation of Explosives) 4-76
4.4.2.3 SWMUs 58FF, 58I, 58O, 58TT, 58UU, 58VV (SWMU 58 Test Locations Involving Burn Tests) 4-146
4.4.2.4 SWMU 58G (HALO Bunker) 4-231
4.4.2.5 SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS) 4-245
4.4.2.6 SWMU 58E (Earth Mound) 4-260
4.4.2.7 SWMU 58–Miscellaneous Sites 4-270

4.5 Investigation 4—Housekeeping Activities, VCMs, and VCAs 4-337

4.5.1 Housekeeping Activities 4-338

4.5.1.1 Debris Removal Activities, January–June 1998 4-338
4.5.1.2 Concrete Removal Activities, January–February 1999 4-338
4.5.1.3 Debris Removal Activities, December 1998—March 1999 4-338

4.5.2 SWMUs 8PP and 8RR Area of Open Burning VCM and VCA Activities 4-346

4.5.2.1 Nonsampling Data Collection 4-346
4.5.2.2 VCM and VCA Activities at SWMUs 8PP and 8RR (Area of Open Burning) 4-346
4.5.2.3 Sampling Activities at SWMUs 8PP and 8RR (Area of Open Burning) 4-351
4.5.2.4 Data Quality for SWMUs 8PP and 8RR (Area of Open Burning) 4-357
4.5.2.5 Data Gaps for SWMUs 8PP and 8RR (Area of Open Burning) 4-364
4.5.2.6 Results and Conclusions for SWMUs 8PP and 8RR (Area of Open Burning) 4-364

TABLE OF CONTENTS (Continued)

4.5.3 SWMUs 8Y and 58B VCM Activities 4-364

4.5.3.1 Nonsampling Data Collection 4-364
4.5.3.2 VCM Activities at SWMUs 8Y and 58B (Debris Pile and Pit) 4-367
4.5.3.3 Sampling Activities at SWMUs 8Y and 58B (Debris Pile and Pit) 4-367
4.5.3.4 Sampling Results for SWMUs 8Y and 58B (Debris Pile and Pit) 4-371
4.5.3.5 Data Quality Results for SWMUs 8Y and 58B (Debris Pile and Pit) 4-385
4.5.3.6 Data Gaps for SWMUs 8Y and 58B (Debris Pile and Pit) 4-385
4.5.3.7 Results and Conclusions for SWMUs 8Y and 58B (Debris Pile and Pit) 4-388

4.5.4 SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF VCA Activities (UCS) 4-388

4.5.4.1 Nonsampling Data Collection 4-388
4.5.4.2 VCA Activities at SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS) 4-388
4.5.4.3 Sampling Activities at SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS) 4-389
4.5.4.4 Sampling Results for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS) 4-389
4.5.4.5 Data Quality Results for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS) 4-389
4.5.4.6 Data Gaps for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS) 4-402

4.6 Summary of Remediation Activities for SWMUs 8 and 58 4-402

5.0 CONCEPTUAL SITE MODELS FOR SWMUS 8 AND 58 5-1

5.1 Nature and Extent of Contamination 5-1

5.1.1 Nature and Extent of Contamination at SWMUs 8 and 58 Combination Area 5-1
5.1.2 Nature and Extent of Contamination at SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area 5-4
5.1.3 Nature and Extent of Contamination at SWMU 8, Features 8PP and 8RR–Area of Open Burning 5-7
5.1.4 Nature and Extent of Contamination at SWMU 58, Feature 58FF—Pile of Fire Bricks 5-9

TABLE OF CONTENTS (Concluded)

5.1.5 Nature and Extent of Contamination at SWMU 58, Feature 58TT—Fire Brick Area No. 2 5-9

5.2 Environmental Fate 5-12
5.3 Site Assessments 5-12

5.3.1 Summary 5-12
5.3.2 Risk Assessments 5-23

5.3.2.1 Risk Assessments for SWMUs 8 and 58 Combination Area 5-23
5.3.2.2 Risk Assessments for SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area 5-25
5.3.2.3 Risk Assessments for SWMU 8, Features 8PP and 8RR–Area of Open Burning 5-27
5.3.2.4 Risk Assessments for SWMU 58, Feature 58FF–Pile of Fire Bricks 5-29
5.3.2.5 Risk Assessments for SWMU 58, Feature 58TT–Fire Brick Area No. 2 5-31

5.4 Baseline Risk Assessments 5-33

5.4.1 Human Health 5-33
5.4.2 Ecological 5-33
5.4.3 Other Applicable Assessments 5-33

6.0 RECOMMENDATION FOR CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS DETERMINATION 6-1

6.1 Rationale 6-1
6.2 Criterion 6-1

7.0 REFERENCES 7-1

LIST OF FIGURES

Figure

2.1-1	Locations of OU 1332 Solid Waste Management Units	2-3
2.1-2	Photograph of Solid Waste Management Units 8 and 58. View to the north	2-7
2.1-3	Map of SWMUs 8 and 58 Features shown in Quadrants A, B, C, and D	2-9
2.1-4	Features Investigated in Quadrant A SWMUs 8 and 58	2-15
2.1-5	Features Investigated in Quadrant B SWMU 58	2-17
2.1-6	Features Investigated in Quadrant C SWMUs 8 and 58	2-19
2.1-7	Features Investigated in Quadrant D SWMU 58	2-21
2.1-8	Pre-cleanup photograph of wooden debris at Features 8Y and 58B. View is to the south	2-23
2.1-9	Pre-cleanup photograph of metal debris at Features 8Y and 58B	2-25
4.3.6-1	Pre-cleanup photograph of the former Radioactive Material Area (RMA) at Feature 8Y	4-9
4.3.6-2	Pre-cleanup photograph of the radioactive white material and Jet Assist Take Off (JATO) motor at the Feature 58B pit	4-11
4.3.6-3	Cleanup photograph of two Jet Assist Take Off (JATO) motors found at Features 8Y and 58B.	4-13
4.3.6-4	Pre-cleanup geophysical survey at Features 8Y and 58B	4-15
4.4.1.2-1	Pre-cleanup photograph of high explosives at the Explosives Contaminated Area (Feature 8DDD).	4-21
4.4.1.2.1-1	Surface sample locations at Feature 58DDD, Explosives Contaminated Area	4-25
4.4.1.3-1	Solid Waste Management Unit 8 Area of Open Burning	4-37
4.4.1.4.1-1	Soil/sediment sample locations along the Arroyo Area (Feature 8GGG)	4-41
4.4.1.5.1-1	Surface and subsurface sample locations at Features 8Y and 58B	4-55

LIST OF FIGURES (Continued)

Figure

4.4.2.2.1-1 Soil sample locations at Feature 58F 4-83

4.4.2.2.1-2 Soil sample locations at Feature 58H 4-85

4.4.2.2.1-3 Soil sample locations at Feature 58U 4-87

4.4.2.2.1-4 Soil sample locations at Feature 58S 4-89

4.4.2.2.1-5 Soil sample locations at Feature 58X 4-91

4.4.2.2.1-6 Soil sample locations at Feature 58Z 4-93

4.4.2.2.1-7 Soil sample locations at Feature 58J 4-95

4.4.2.2.1-8 Soil sample locations at Feature 58L 4-97

4.4.2.3.1-1 Surface sample locations at Feature 58FF 4-149

4.4.2.3.1-2 Subsurface sample locations at Feature 58FF 4-151

4.4.2.3.3-1 Surface and subsurface sample locations at Feature 58I 4-181

4.4.2.3.3-2 Surface and subsurface sample locations at Feature 58O 4-183

4.4.2.3.3-3 Radiological Survey Area and surface sample locations at Feature 58TT (Firebrick Area No. 2) 4-187

4.4.2.3.3-4 Radiological Survey Area and surface sample locations at Feature 58UU (Firebrick Area No. 3) 4-189

4.4.2.3.3-5 Radiological Survey Area and sample locations at Feature 58VV (Firebrick Area No. 1) 4-191

4.4.2.4.1-1 Surface soil and swipe sample locations at Feature 58G (HALO Bunker) 4-233

4.4.2.5-1 Borehole locations at the Solid Waste Management Unit 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) 4-247

4.4.2.5-2 Manhole sample locations at the Solid Waste Management Unit 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) 4-249

4.4.2.6.1-1 Surface and trench sample locations at Feature 58E, Earth Mound 4-261

LIST OF FIGURES (Continued)

Figure

4.4.2.7.1-1 Excavation locations at mound and trench features located at Solid Waste Management Unit 58 4-273

4.4.2.7.1-2 Sample location at Feature 58YY (Concrete Pad No. 1) 4-277

4.4.2.7.1-3 Sample location at Feature 58XX (Concrete Pad No. 2) 4-279

4.4.2.7.1-4 Sample location at Feature 58WW (Three Wooden Poles and Metal Pipe) ... 4-281

4.4.2.7.1-5 Location of Features 58OO (Open Borehole), 58SS (Open Borehole No. 1) and 58ZZ (Open Borehole No. 2) 4-285

4.4.2.7.1-6 Sample locations at Feature 58AAA (Building 9800 Drywell) 4-287

4.4.2.7.1-7 Photograph of drywell that Serviced Building 9800 (Feature 58AAA) 4-289

4.4.2.7.1-8 Sample locations at Feature 58CCC (Building 9805 Drainpipe) 4-293

4.4.2.7.1-9 Photograph of drainpipe that serviced Building 9805, Feature 58CC. The floor drain is beneath the rock. The view is to the northwest. 4-295

4.5.1.2-1 Concrete Features removed at SWMUs 8 and 58, January through February 1999 4-339

4.5.1.3-1 Housekeeping Activity Features removed at SWMUs 8 and 58, December 1998 through March 1999 4-343

4.5.2.2-1 Photograph of metal slag fragments at Area of Open Burning (Features 8PP and 8RR) 4-349

4.5.2.2-2 Remediated Area at Area of Open Burning (Features 8PP and 8RR), February 2004. View to the southwest. 4-353

4.5.2.3-1 Confirmatory sample locations at Area of Open Burning (Features 8PP and 8RR), January-February 2004 4-355

4.5.3.1-1 Photograph of charcoal and ash mixed with soil, Feature 58B pit. View to the south. 4-365

4.5.3.2-1 Photograph of Features 8Y/58B following site remediation/restoration activities. View to southeast. 4-369

4.5.3.3-1 Post-VCM Confirmatory Sample Locations at Features 8Y/58B. 4-373

LIST OF FIGURES (Concluded)

Figure

4.5.4.3-1 Confirmatory soil sample locations at the SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) 4-391

5.2-1 Conceptual Site Model Flow Diagram for SWMUs 8 and 58 Combination Area.....5-13

5.2-2 Conceptual Site Model Flow Diagram for SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area.....5-15

5.2-3 Conceptual Site Model Flow Diagram for SWMU 8, Features 8PP and 8RR, Area of Open Burning 5-17

5.2-4 Conceptual Site Model Flow Diagram for SWMU 58, Feature 58FF, Pile of Fire Bricks.....5-19

5.2-5 Conceptual Site Model Flow Diagram for SWMU 58, Feature 58TT, Fire Brick Area No. 2.....5-21

LIST OF TABLES

Table

2.1-1 SWMU 8 and SWMU 58 Features 2-11

2.2-1 Research Tests Conducted at SWMUs 8 and 58 2-28

4.3.2-1 Summary of Background Information Reviewed for SWMUs 8 and 58 4-4

4.4.1-1 Summary of Field Activities Conducted at SWMU 8 4-19

4.4.1.2.2-1 Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling, Metals Analytical Results October 1995 and February 1998 (On- and Off-Site Laboratories) 4-27

4.4.1.2.2-2 Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling, Gamma Spectroscopy Analytical Results June 1995 (On-Site Laboratory) 4-30

4.4.1.2.2-3 Summary of HE Compounds Analytical MDLs for SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling October 1995 and February 1998 (On- and Off-Site Laboratories) 4-33

4.4.1.2.3-1 Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) Field Duplicate Relative Percent Difference Values June 1995 and February 1998 (Off-Site Laboratories) 4-34

4.4.1.4.2-1 Summary of SWMU 8 Feature 8GGG (Arroyo Area) RFI Soil Sampling, Metals Analytical Results November 1996 and January 1998 (On- and Off-Site Laboratories) 4-44

4.4.1.4.2-2 Summary of Analytical Detections of HE Compounds for SWMU 8, Feature 8GGG (Arroyo Area) Soil Samples November 1996 and January 1998 (On- and Off-Site Laboratories) 4-47

4.4.1.4.2-3 Summary of HE Compounds Analytical MDLs for SWMU 8, Feature 8GGG (Arroyo Area) RFI Soil Sampling November 1996 and January 1998 (On- and Off-Site Laboratories) 4-48

4.4.1.4.2-4 Summary of SWMU 8, Feature 8GGG (Arroyo Area) RFI Soil Sampling, Gamma Spectroscopy Analytical Results January 1998 (On-Site Laboratory) 4-50

LIST OF TABLES (Continued)

Table

4.4.1.4.3-1 Summary of SWMU 8 Feature 8GGG (Arroyo Area) Field Duplicate Relative Percent Difference Values January 1998 (Off-Site Laboratory) 4-52

4.4.1.5.2-1 Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, Metals Analytical Results April 1996 and January 1999 (Off-Site Laboratory) 4-58

4.4.1.5.2-2 Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, Gamma Spectroscopy Analytical Results January 1999 (On-Site Laboratory) 4-62

4.4.1.5.2-3 Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, Tritium Analytical Results January 1999 (Off-Site Laboratory) 4-63

4.4.1.5.2-4 Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, VOC Analytical Results April 1996 and January 1999 (Off-Site Laboratory) 4-64

4.4.1.5.2-5 Summary of VOC Analytical MDLs for SWMU 58, Feature 58B RFI Borehole Soil Sampling April 1996 and January 1999 (Off-Site Laboratory) 4-65

4.4.1.5.2-6 Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, SVOC Analytical Results April 1996 and January 1999 (Off-Site Laboratory) 4-66

4.4.1.5.2-7 Summary of SVOC Analytical MDLs for SWMU 58, Feature 58B RFI Borehole Soil Sampling April 1996 and January 1999 (Off-Site Laboratory) 4-67

4.4.1.5.2-8 Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, TPH Analytical Results April 1996 and January 1999 (Off-Site Laboratory) 4-69

4.4.1.5.2-9 Summary of HE Compounds Analytical MDLs for SWMU 58, Feature 58B RFI Borehole Soil Sampling April 1996 and January 1999 (Off-Site Laboratory) 4-70

4.4.1.5.3-1 Summary of SWMU 58, Feature 58B Borehole Field Duplicate Relative Percent Difference Values April 1996 (Off-Site Laboratory) 4-72

4.4.2-1 Summary of Field Activities Conducted at SWMU 58.....4-77

4.4.2.2.2-1 List of Tables That Present the Results of RFI Soil Sampling at Sites Involving Detonation of Explosives, SWMU 58, Features 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z 4-100

LIST OF TABLES (Continued)

Table

4.4.2.2.2-2 Summary of SWMU 58, Feature 58F RFI Soil Sampling, Metals Analytical Results March 1996 and October 1997 (On- and Off-Site Laboratories) 4-102

4.4.2.2.2-3 Summary of SWMU 58, Feature 58H RFI Soil Sampling, Metals Analytical Results March 1996 and October 1997 (On- and Off-Site Laboratories) 4-105

4.4.2.2.2-4 Summary of SWMU 58, Feature 58U RFI Soil Sampling, Metals Analytical Results March 1996 and November 1997 (On- and Off-Site Laboratories) ...4-110

4.4.2.2.2-5 Summary of Analytical Detections of HE Compounds in SWMU 58, Feature 58F RFI Soil Samples September 1998 (Off-Site Laboratory).....4-113

4.4.2.2.2-6 Summary of Analytical Detections of HE Compounds in SWMU 58, Feature 58J RFI Soil Samples September 1998 (Off-Site Laboratory) 4-114

4.4.2.2.2-7 Summary of Analytical Detections of HE Compounds in SWMU 58, Feature 58L RFI Soil Samples September 1998 (Off-Site Laboratory).....4-115

4.4.2.2.2-8 Summary of Analytical Detections of HE Compounds in SWMU 58, Feature 58S RFI Soil Samples October 1997 (Off-Site Laboratory) 4-116

4.4.2.2.2-9 Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58F, 58H, 58J, 58L, and 58S RFI Soil Sampling October 1997 and September 1998 (Off-Site Laboratory) 4-117

4.4.2.2.2-10 Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58U, 58X, and 58Z RFI Soil Sampling March–May 1996 (Off-Site Laboratory) 4-118

4.4.2.2.2-11 Summary of SWMU 58, Feature 58F RFI Soil Sampling, Gamma Spectroscopy Analytical Results March 1996 (On- and Off-Site Laboratories).....4-119

4.4.2.2.2-12 Summary of SWMU 58, Feature 58H RFI Soil Sampling, Gamma Spectroscopy Analytical Results March 1996 (On- and Off-Site Laboratories).....4-122

4.4.2.2.2-13 Summary of SWMU 58, Feature 58J RFI Soil Sampling, Gamma Spectroscopy Analytical Results September 1998 (On-Site Laboratory).....4-125

4.4.2.2.2-14 Summary of SWMU 58, Feature 58L RFI Soil Sampling, Gamma Spectroscopy Analytical Results September 1998 (On-Site Laboratory).....4-127

LIST OF TABLES (Continued)

Table

4.4.2.2.2-15 Summary of SWMU 58, Feature 58S RFI Soil Sampling, Gamma Spectroscopy Analytical Results October 1997 (On-Site Laboratory).....4-129

4.4.2.2.2-16 Summary of SWMU 58, Feature 58U RFI Soil Sampling, Gamma Spectroscopy Analytical Results March 1996 (On- and Off-Site Laboratories).....4-131

4.4.2.2.2-17 Summary of SWMU 58, Feature 58X RFI Soil Sampling, Gamma Spectroscopy Analytical Results May 1996 (On-Site Laboratory).....4-134

4.4.2.2.2-18 Summary of SWMU 58, Feature 58Z RFI Soil Sampling, Gamma Spectroscopy Analytical Results June 1995 (On-Site Laboratory).....4-137

4.4.2.2.2-19 Summary of SWMU 58, Feature 58U RFI Soil Sampling, Gross Alpha Beta Analytical Results November 1997 (Off-Site Laboratory) 4-139

4.4.2.2.2-20 Summary of SWMU 58, Feature 58F Field Duplicate Relative Percent Difference Values March 1996 and October 1997 (On- and Off-Site Laboratories).....4-143

4.4.2.2.2-21 Summary of SWMU 58, Feature 58H Field Duplicate Relative Percent Difference Values March 1996 and October 1997 (On- and Off-Site Laboratories).....4-144

4.4.2.2.2-22 Summary of SWMU 58, Feature 58U Field Duplicate Relative Percent Difference Values March 1996 and October 1997 (On- and Off-Site Laboratories).....4-145

4.4.2.3.2-1 Summary of SWMU 58, Feature 58FF RFI Surface Soil Sampling, Metals Analytical Results June 1995 and January 1999 (Off-Site Laboratory).....4-153

4.4.2.3.2-2 Summary of SWMU 58, Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results April 1996, August 1996, and April 1997 (Off-Site Laboratory) 4-155

4.4.2.3.2-3 Summary of HE Compounds Analytical MDLs for SWMU 58, Feature 58FF RFI Soil Sampling June 1995 and January 1999 (Off-Site Laboratories).....4-163

4.4.2.3.2-4 Summary of HE Compounds Analytical MDLs for SWMU 58, Feature 58FF RFI Borehole Sampling April 1996 (Off-Site Laboratory).....4-164

LIST OF TABLES (Continued)

Table

4.4.2.3.2-5 Summary of SVOC Analytical MDLs for SWMU 58, Feature 58FF RFI Borehole Sampling April 1996 (Off-Site Laboratory).....4-166

4.4.2.3.2-6 Summary of SWMU 58, Feature 58FF RFI Soil Sampling, VOC Analytical Results June 1995 and January 1999 (On-Site and Off-Site Laboratory).....4-168

4.4.2.3.2-7 Summary of VOCs Analytical MDLs for SWMU 58, Feature 58FF RFI Borehole Sampling April 1996 (Off-Site Laboratory).....4-169

4.4.2.3.2-8 Summary of SWMU 58, Feature 58FF RFI Soil Sampling, Gamma Spectroscopy Analytical Results June 1995 (On-Site Laboratory).....4-170

4.4.2.3.2-9 Summary of SWMU 58, Feature 58FF RFI Borehole Gamma Spectroscopy Analytical Results August 1996 and April 1997 (On-Site Laboratory) 4-172

4.4.2.3.2-10 Summary of SWMU 58, Feature 58FF Field Duplicate Relative Percent Difference Values April 1996, August 1996, April 1997, and January 1999 (Off-Site Laboratory) 4-178

4.4.2.3.4-1 Summary of SWMU 58, Feature 58O RFI Surface Soil Sampling, Metals Analytical Results April 1996 and December 1997 (On- and Off-Site Laboratories).....4-193

4.4.2.3.4-2 Summary of SWMU 58, Feature 58O RFI Borehole Soil Sampling, Metals Analytical Results April 1996 (Off-Site Laboratory).....4-197

4.4.2.3.4-3 Summary of SWMU 58, Feature 58TT (Firebrick Area No. 2) VCA Confirmatory Soil Sampling, Metals Analytical Results March 1999 (Off-Site Laboratory) 4-199

4.4.2.3.4-4 Summary of SWMU 58, Feature 58UU (Firebrick Area No. 3) RFI Soil Sampling, Metals Analytical Results January 1999 and March 2000 (Off-Site Laboratory) 4-201

4.4.2.3.4-5 Summary of SWMU 58, Feature 58VV (Firebrick Area No. 1) RFI Soil Sampling, Metals Analytical Results January 1999 (Off-Site Laboratory).....4-204

4.4.2.3.4-6 Summary of SWMU 58, Feature 58O RFI Soil Sampling, VOC Analytical Results April and December 1997 (On- and Off-Site Laboratories) 4-205

4.4.2.3.4-7 Summary of VOC Analytical MDLs for SWMU 58, Features 58I and 58O RFI Surface Soil Sampling April 1996 and December 1997 (On- and Off-Site Laboratories).....4-206

LIST OF TABLES (Continued)

Table

4.4.2.3.4-8 Summary of VOC Analytical MDLs for SWMU 58, Features 58I and 58O RFI Subsurface Soil Sampling April 1996 (Off-Site Laboratory) 4-207

4.4.2.3.4-9 Summary of SWMU 58, Feature 58I RFI Soil Sampling, SVOC Analytical Results April and May 1996 (Off-Site Laboratory) 4-208

4.4.2.3.4-10 Summary of SWMU 58, Feature 58O RFI Soil Sampling, SVOC Analytical Results April 1996 (Off-Site Laboratory)..... 4-210

4.4.2.3.4-11 Summary of SVOC Analytical MDLs for SWMU 58, Features 58I and 58O RFI Soil Sampling April–May 1996 (Off-Site Laboratory)..... 4-212

4.4.2.3.4-12 Summary of SVOC Analytical MDLs for SWMU 58, Features 58I and 58O RFI Borehole Soil Sampling April 1996 (Off-Site Laboratory) 4-214

4.4.2.3.4-13 Summary of SWMU 58, Feature 58O RFI Soil Sampling, HE Analytical Results April 1996 (Off-Site Laboratory)..... 4-216

4.4.2.3.4-14 Summary of HE Compounds Analytical MDLs for SWMU 58, Feature 58O Surface and Borehole RFI Soil Sampling April 1996 (Off-Site Laboratory) 4-217

4.4.2.3.4-15 Summary of HE Compounds Analytical MDLs for SWMU 58, Feature 58TT (Firebrick Area No. 2) RFI Soil Sampling March 1999 (Off-Site Laboratory) 4-218

4.4.2.3.4-16 Summary of SWMU 58, Feature 58TT (Firebrick Area No. 2) RFI Soil Sampling, Gamma Spectroscopy Analytical Results March 1999 (On-Site Laboratory) 4-219

4.4.2.3.4-17 Summary of SWMU 58, Feature 58UU (Firebrick Area No. 3) RFI Soil Sampling, Gamma Spectroscopy Analytical Results January 1999 and March 2000 (On-Site Laboratory)..... 4-221

4.4.2.3.4-18 Summary of SWMU 58, Feature 58VV (Firebrick Area No. 1) RFI Soil Sampling, Gamma Spectroscopy Analytical Results January 1999 (On-Site Laboratory) 4-223

4.4.2.3.4-19 Summary of SWMU 58, Feature 58O Field Duplicate Relative Percent Difference Values April 1996 and December 1997 (Off-Site Laboratory)..... 4-228

4.4.2.3.4-20 Summary of SWMU 58, Feature 58TT (Firebrick Area No.2) Field Duplicate Relative Percent Difference Values March 1999 (Off-Site Laboratory) 4-229

LIST OF TABLES (Continued)

Table

4.4.2.3.4-21 Summary of SWMU 58, Feature 58UU (Firebrick Area No.3) Field Duplicate Relative Percent Difference Values March 2000 (Off-Site Laboratory) 4-230

4.4.2.4.2-1 Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Swipe Sampling, Metals Analytical Results May 1996 (Off-Site Laboratory) 4-235

4.4.2.4.2-2 Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Sediment/Soil Sampling, Metals Analytical Results April 1996 (Off-Site Laboratory) 4-238

4.4.2.4.2-3 Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Soil Sampling, Gamma Spectroscopy Analytical Results April 1996 (On-Site Laboratory) 4-242

4.4.2.4.3-1 Summary of SWMU 58, Feature 58G (HALO Bunker) Field Duplicate Relative Percent Difference Values April–May 1996 (Off-Site Laboratory) 4-244

4.4.2.5.2-1 Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System Manholes) RFI Soil Sampling, VOC Analytical Results March 1996 (Off-Site Laboratory) 4-252

4.4.2.5.2-2 Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) RFI Borehole Soil Sampling, VOC Analytical Results April 1996 (Off-Site Laboratory) 4-254

4.4.2.5.2-3 Summary of VOC Analytical MDLs for SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) RFI Soil Sampling March-April 1996 (Off-Site Laboratory) 4-257

4.4.2.5.2-4 Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) RFI Soil Sampling, Gamma Spectroscopy Analytical Results March-April 1996 (On-Site Laboratory) 4-258

4.4.2.6.2-1 Summary of SWMU 58, Feature 58E (Earth Mound) RFI Soil Sampling Metals Analytical Results May 1996 and February 1997 (On- and Off-Site Laboratories) 4-264

4.4.2.6.2-2 Summary of SWMU 58, Feature 58E (Earth Mound) RFI Soil Sampling, Gamma Spectroscopy Analytical Results February 1997 (On-Site Laboratory) 4-269

4.4.2.6.2-3 Summary of SWMU 58, Feature 58E (Earth Mound) Field Duplicate Relative Percent Difference Values May 1996—February 1997 (On- and Off-Site Laboratories) 4-271

LIST OF TABLES (Continued)

Table

4.4.2.7.1-1 Debris Found During Exploratory Trenching at SWMU 58 December 1998 4-275

4.4.2.7.2-1 Summary of SWMU 58, Features 58XX, 58WW, 58YY (Miscellaneous Sites) RFI Soil Sampling, Metals Analytical Results January 1999 (Off-Site Laboratory) 4-297

4.4.2.7.2-2 Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58XX, 58WW, and 58YY (Miscellaneous Sites) Soil Sampling January 1999 (Off-Site Laboratory) 4-298

4.4.2.7.2-3 Summary of SWMU 58, Features 58XX, 58WW, and 58YY (Miscellaneous Sites) RFI Soil Sampling, Gamma Spectroscopy Analytical Results January 1999 (On-Site Laboratory) 4-299

4.4.2.7.2-4 Summary of SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) Soil Sampling, Metals Analytical Results April 1997 and January 1999 (Off-Site Laboratory) 4-301

4.4.2.7.2-5 Summary of SWMU 58, Feature 58ZZ (Open Borehole No. 2) Soil Sampling, HE Analytical Results January 1999 (Off-Site Laboratory) 4-304

4.4.2.7.2-6 Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) Soil Sampling April 1997 and January 1999 (Off-Site Laboratory) 4-306

4.4.2.7.2-7 Summary of SWMU 58, Feature 58OO (Open Borehole) Soil Sampling, SVOC Analytical Results April 1997 (Off-Site Laboratory) 4-307

4.4.2.7.2-8 Summary of SVOC Analytical MDLs for SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) RFI Soil Sampling April 1997 and January 1999 (Off-Site Laboratory) 4-308

4.4.2.7.2-9 Summary of SWMU 58, Feature 58SS (Open Borehole No. 1) Soil Sampling, VOC Analytical Results January 1999 (Off-Site Laboratory) 4-310

4.4.2.7.2-10 Summary of SWMU 58, Feature 58ZZ (Open Borehole No. 2) Soil Sampling, VOC Analytical Results January 1999 (Off-Site Laboratory) 4-311

4.4.2.7.2-11 Summary of VOC Analytical MDLs for SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) RFI Soil Sampling April 1997 and January 1999 (Off-Site Laboratory) 4-312

LIST OF TABLES (Continued)

Table

4.4.2.7.2-12 Summary of SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) RFI Soil Sampling, Gamma Spectroscopy Analytical Results April 1997 and January 1999 (On-Site Laboratory) 4-313

4.4.2.7.2-13 Summary of SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling, Metals Analytical Results January 1999 (Off-Site Laboratory) 4-315

4.4.2.7.2-14 Summary of SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling, HE Analytical Results January 1999 (Off-Site Laboratory)..... 4-317

4.4.2.7.2-15 Summary of HE Compound Analytical MDLs for SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling January 1999 (Off-Site Laboratory) 4-318

4.4.2.7.2-16 Summary of SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling SVOC Analytical Results January 1999 (Off-Site Laboratory) 4-319

4.4.2.7.2-17 Summary of SVOC Analytical MDLs for SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling January 1999 (Off-Site Laboratory) 4-320

4.4.2.7.2-18 Summary of VOC Analytical MDLs for SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling January 1999 (Off-Site Laboratory) 4-322

4.4.2.7.2-19 Summary of SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling Gamma Spectroscopy Analytical Results January 1999 (On-Site Laboratory) 4-323

4.4.2.7.2-20 Summary of SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling, Metals Analytical Results September 1996 (Off-Site Laboratory) 4-324

4.4.2.7.2-21 Summary of HE Compounds Analytical MDLs for SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling September 1996 (Off-Site Laboratory) 4-327

4.4.2.7.2-22 Summary of SVOC Analytical MDLs for SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling September 1996 (Off-Site Laboratory) 4-328

4.4.2.7.2-23 Summary of VOC Analytical MDLs for SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling September 1996 (Off-Site Laboratory) 4-330

LIST OF TABLES (Continued)

Table

4.4.2.7.2-24 Summary of SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling Gamma Spectroscopy Analytical Results September 1996 (On-Site Laboratory) 4-331

4.4.2.7.2-25 Summary of SWMU 58, Feature 58OO Field Duplicate Relative Percent Difference Values April 1997 (Off-Site Laboratory) 4-333

4.4.2.7.2-26 Summary of SWMU 58, Feature 58SS Field Duplicate Relative Percent Difference Values January 1999 (Off-Site Laboratory) 4-334

4.4.2.7.2-27 Summary of SWMU 58, Feature 58AAA Field Duplicate Relative Percent Difference Values January 1999 (Off-Site Laboratory) 4-335

4.4.2.7.2-28 Summary of SWMU 58, Feature 58CCC Field Duplicate Relative Percent Difference Values September 1996 (Off-Site Laboratory) 4-336

4.5.2.3-1 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Confirmatory Soil Sampling Metals Analytical Results February 2004 (Off-Site Laboratory) 4-358

4.5.2.3-2 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Confirmatory Soil Sampling Gamma Spectroscopy Analytical Results February 2004 (On-Site Laboratory) 4-361

4.5.2.4-1 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Field Duplicate Relative Percent Difference Values February 2004 (Off-Site Laboratory) 4-363

4.5.3.4-1 Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Soil Confirmatory Sampling Metals and Total Uranium Analytical Results September 1998 and January 1999 (Off-Site Laboratory) 4-375

4.5.3.4-2 Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Soil Confirmatory Sampling HE Compound Analytical Results September 1998 and January 1999 (Off-Site Laboratories) 4-379

4.5.3.4-3 Summary of HE Compound Analytical MDLs for SWMUs 8 and 58, Features 8Y and 58B VCM Confirmatory Soil Sampling September 1998 and January 1999 (Off-Site Laboratory) 4-381

4.5.3.4-4 Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Confirmatory Soil Sampling Gamma Spectroscopy Analytical Results September 1998 and January 1999 (On-Site Laboratory) 4-382

LIST OF TABLES (Continued)

Table

4.5.3.4-5 Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Confirmatory Soil Sampling Tritium Analytical Results September 1998 and January 1999 (Off-Site Laboratories).....4-386

4.5.3.5-1 Summary of SWMUs 8 and 58, Features 8Y and 58B Field Duplicate Relative Percent Difference Values September 1998 and January 1999 (Off-Site Laboratories) 4-387

4.5.4.3-1 Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) VCA Confirmatory Soil Sampling Metals Analytical Results October 2000 (Off-Site Laboratory).....4-393

4.5.4.3-2 Summary SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) VCA Confirmatory Soil Sampling VOC Analytical Results October 2000 (Off-Site Laboratory) 4-396

4.5.4.3-3 Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) VCA Confirmatory Soil Sampling Gamma Spectroscopy Analytical Results October 2000 (On-Site Laboratory) 4-398

4.5.4.5-1 Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) VCA Field Duplicate Relative Percent Difference Values October 2000 (Off-Site Laboratory).....4-401

4.6-1 Status of Features at SWMU 8 and SWMU 58.....4-403

5.1.1-1 Summary of COCs for SWMUs 8 and 58 Combination Area..... 5-2

5.1.1-2 Summary of COCs for SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area..... 5-5

5.1.1-3 Summary of COCs for SWMU 8, Features 8PP and 8RR–Area of Open Burning 5-8

5.1.1-4 Summary of COCs for SWMU 58, Feature 58FF–Pile of Fire Bricks.....5-10

5.1.1-5 Summary of COCs for SWMU 58, Feature 58TT–Fire Brick Area No. 2.....5-11

5.3.2.1.1-1 Summation of Incremental Nonradiological and Radiological Risks from SWMUs 8 and 58 Combination Area.....5-24

5.3.2.2.1-1 Summation of Incremental Nonradiological and Radiological Risks from SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area.....5-26

LIST OF TABLES (Concluded)

Table

5.3.2.3.1-1 Summation of Incremental Nonradiological and Radiological Risks from SWMU 8, Features 8PP and 8RR–Area of Open Burning.....5-28

5.3.2.4.1-1 Summation of Incremental Nonradiological and Radiological Risks from SWMU 58, Feature 58FF–Pile of Fire Bricks.....5-30

5.3.2.5.1-1 Summation of Incremental Nonradiological and Radiological Risks from SWMU 58, Feature 58TT–Fire Brick Area No. 2 5-32

LIST OF ANNEXES

Annex

A Risk Assessment for SWMUs 8 and 58

B RFI Results for Soil Removed During VCM/VCA Activities (Not Applicable to Risk Assessment Analysis)

C Gamma Spectroscopy Results

D Surface-Water Site Assessment for SWMUs 8 and 58

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ACRONYMS AND ABBREVIATIONS

ACM	asbestos-containing materials
AOP	Administrative Operating Procedure
AR/COC	Analysis Request/Chain-of-Custody
bgs	below ground surface
CAC	Corrective Action Complete
CCB	continuing calibration blank
CCV	continuing calibration verification
CEARP	Comprehensive Environmental Assessment and Response Program
COC	constituent of concern
cpm	counts per minute
DOE	U.S. Department of Energy
DU	depleted uranium
EB	equipment blank
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ERCL	Environmental Restoration Chemistry Laboratory
ERG	Environmental Restoration Group, Inc.
FB	field blank
FOP	Field Operating Procedure
GEL	General Engineering Laboratories, Inc.
HE	high explosive(s)
HI	hazard index
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HQ	hazard quotient
HWB	Hazardous Waste Bureau
ICB	initial calibration blank
ID	Identification
JATO	jet assist takeoff
JP-4	jet propellant, grade 4
KAFB	Kirtland Air Force Base
kg	kilogram(s)
L	liter
LAS	Lockheed Analytical Services
lb	pound
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MDA	minimum detectable activity
MDL	method detection limit
μg	microgram(s)
μR/hr	microroentgen(s) per hour
mg	milligram(s)
mm	millimeter(s)
mrem	millirem
MS	matrix spike
MSD	matrix spike duplicate
NMED	New Mexico Environment Department

ACRONYMS AND ABBREVIATIONS (Concluded)

OU	Operable Unit
pCi/g	picocurie(s) per gram
pCi/L	picocurie(s) per liter
PQL	practical quantitation limit
PSI	Preliminary Site Investigation
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RFI	RCRA Facility Investigation
RMMA	Radiological Materials Management Area
RP	Radiation Protection
RPD	relative percent difference
RPSD	Radiation Protection Sample Diagnostics Laboratory
SB	soil blank
SNL/NM	Sandia National Laboratories/New Mexico
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TB	trip blank
TEDE	total effective dose equivalent
tetryl	methyl-2,4,6-trinitrophenylnitramine
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
UCS	Underground Conduit System
USAF	U.S. Air Force
UXO	unexploded ordnance
VCA	Voluntary Corrective Action
VCM	Voluntary Corrective Measure
VOC	volatile organic compound
yr	year

1.0 SUMMARY

Sandia National Laboratories/New Mexico (SNL/NM) is proposing a risk-based determination of Corrective Action Complete (CAC) without controls decision (NMED April 2004) for Environmental Restoration (ER) Solid Waste Management Unit (SWMU) 8, Open Dump (Coyote Canyon Blast Area) and SWMU 58 except for Feature 58FF within SWMU 58, Coyote Canyon Blast Area, Operable Unit (OU) 1332, on Kirtland Air Force Base (KAFB). A risk-based determination of CAC with controls is recommended for Feature 58FF within SWMU 58 because lead is present in soil at levels that exceed the U.S. Environmental Protection Agency (EPA) residential screening level. SWMU 8 is contained within SWMU 58 and many features overlap. It is not possible to separate the constituents of concern (COCs) of one SWMU from the other; therefore, the sites are combined into this CAC proposal.

Chapter 2.0 of this proposal presents the site description and operational history for SWMUs 8 and 58 and lists the COCs for the sites. Chapter 3.0 describes the current and future land use, and Chapter 4.0 details the investigations and remedial activities conducted at SWMUs 8 and 58. Chapter 5.0 discusses the conceptual site models for SWMUs 8 and 58.

Review and analysis of all relevant data from the characterization and remediation of SWMUs 8 and 58 indicate that levels of COCs at these sites are less than applicable risk assessment action levels. Based upon these findings, a risk-based determination of CAC without controls (NMED April 2004) is recommended for SWMUs 8 and 58, except for Feature 58FF, which is recommended for CAC with controls.

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2.0 DESCRIPTION AND OPERATIONAL HISTORY

This chapter provides the site description and operational history for SWMUs 8 and 58, lists the COCs, and describes cleanup activities performed at the sites prior to the ER Project investigations.

2.1 Site Description

SWMUs 8 and 58 are located near the eastern boundary between U.S. Air Force (USAF) land and other USAF land withdrawn from the U.S. Forest Service and permitted to the U.S. Department of Energy (DOE) (Figure 2.1-1). The sites are located north of Coyote Springs Road, approximately 2.7 miles east of the intersection of Coyote Springs and Lovelace Roads.

The elevation at SWMUs 8 and 58 ranges from approximately 5,880 to 6,280 feet above mean sea level. SWMU 8 and the central portion of SWMU 58 are generally flat with a slight slope to the south-southwest. SWMU 58 is bordered on the northwest by a ridge. A small arroyo runs from the north to the south through the western side of the site. This arroyo is a tributary of the Arroyo del Coyote, a medium-sized arroyo that runs from east to west just south of the site. Both arroyos are dry except during and immediately following heavy storms. The average rainfall, as measured at Albuquerque International Sunport, is 8.3 inches per year (NOAA 1997). Estimates of evapotranspiration for the KAFB area range from 95 to 99 percent of the annual rainfall (SNL/NM February 1998a).

Alluvium fills the arroyo floors and a veneer of weathered bedrock (colluvium) covers the surrounding slopes. Soil types across the two sites consist of Gila sandy loam, the Tesajo-Millet gravelly loam, and the Salas Complex (clayey to gravelly loam). The soils are poorly developed and are primarily derived from greenstone, limestone, and quartzite from the Manzanita Mountains.

SWMUs 8 and 58 are located in the Arroyo del Coyote watershed which captures runoff from the western flank of the Manzanita Mountains. No surface-water bodies are located at either site. The nearest surface water is Coyote Springs, a perennial spring located approximately 1,400 feet southwest of SWMU 58 in Arroyo del Coyote. Arroyo del Coyote intersects Tijeras Arroyo approximately 7 miles west of the two sites. Tijeras Arroyo eventually drains into the Rio Grande, approximately 16 miles west of the two sites. Surface-water samples are routinely collected at monitoring station MP-06, which is located 1.1 miles southwest of SWMU 58 (SNL/NM September 2003).

No regulatory compliance issues concerning groundwater or surface water specifically apply to either SWMUs 8 or 58. Groundwater studies for the area are routinely presented in the "Annual Groundwater Monitoring Report" (SNL/NM April 2004). The nearest downgradient monitoring well, Greystone MW-2, is located approximately 3,200 feet southwest of SWMU 58. In April 2002, Greystone MW-2 was installed as a replacement well for the old homestead Greystone Manor Well. Because of declining water levels and a severely corroded well casing, the Greystone Manor Well was plugged and abandoned in September 2002. Greystone MW-2 was screened in Quaternary alluvium at a depth of 60 to 80 feet below ground surface (bgs). In March 2003, the depth to water at Greystone MW-2 was 51 feet bgs. The nearest water-supply

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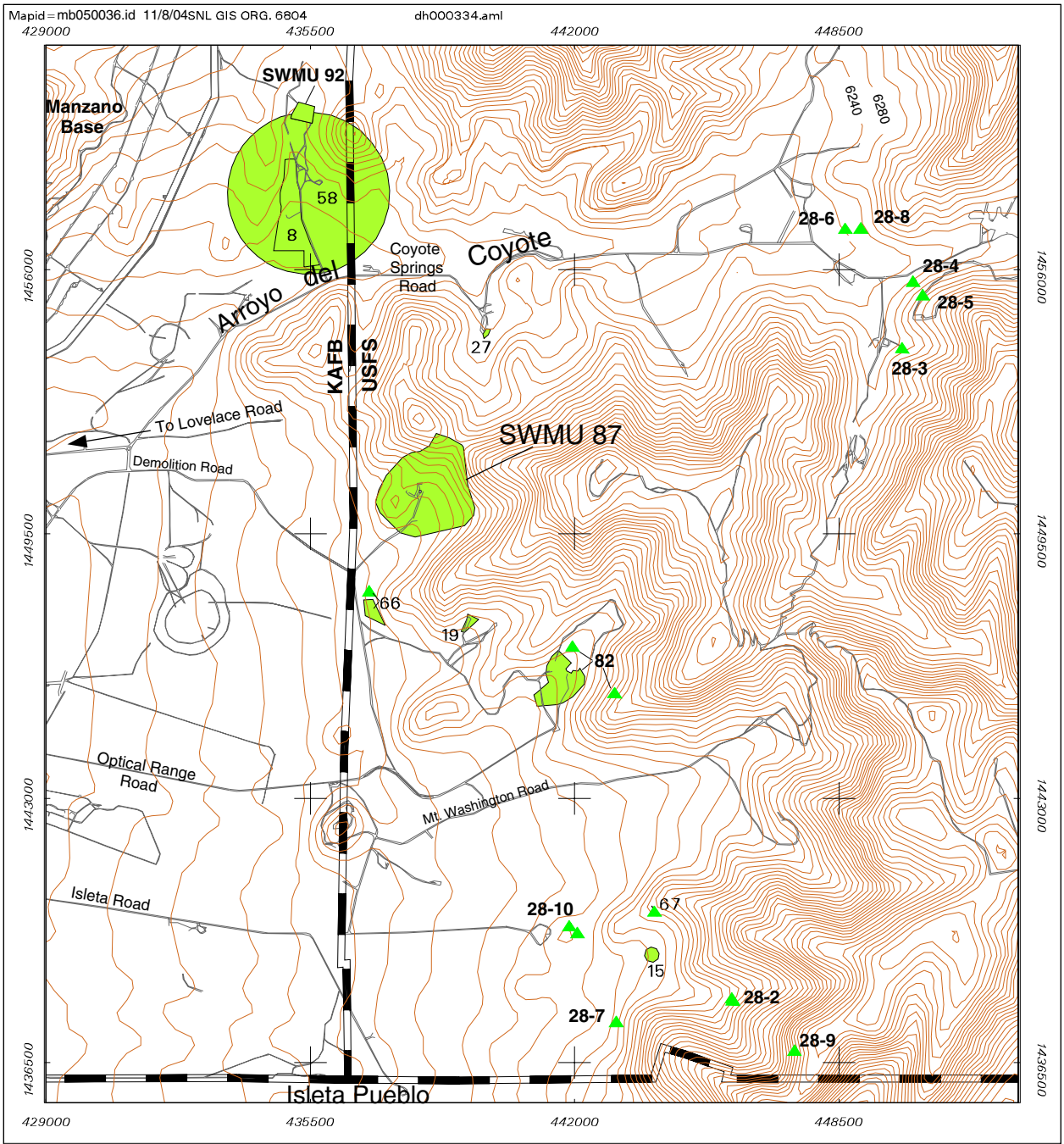


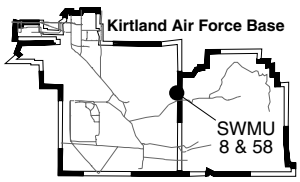
Legend

- Road
- 40 Foot Contour
- KAFB Boundary
- OU 1332 SWMUs (▲ = area < 0.2 acres)

0 2000 4000
Scale in Feet

0 480 960
Scale in Meters

Figure 2.1-1
Locations of OU 1332 Solid Waste Management Units



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well used for drinking water is KAFB-11, which is located approximately 3.6 miles northwest of SWMU 58.

The vegetation at SWMUs 8 and 58 primarily consists of sparse grasses and cacti. Scattered juniper trees are found in small numbers.

SWMUs 8 and 58 are related by the nature of the research activities conducted at the sites and their proximity. SWMU 58 encompasses approximately 255 acres and is the site of the former Coyote Canyon Blast Area where extensive explosive testing was conducted. A blast radius of 2,000 feet defines the boundary of SWMU 58. This boundary was based upon the visual distribution of fragments (shrapnel) and the surrounding topography. The blast radius is shown in Figures 2.1-2 and 2.1-3.

SWMU 8 is fully contained within the blast radius of SWMU 58 and consists of approximately 30 acres. A north-south road that bisects SWMU 58 provides access to the site. The boundaries of SWMU 8 are defined by this road to the east, by the end of debris and test fixtures to the north (approximately 3,200 feet north of Coyote Springs Road), by the base of the steep ridge to the west, and by the end of debris and test fixtures to the south as shown in Figure 2.1-3. The debris and the majority of the test fixtures have been removed.

SWMU 58 originally contained two control bunkers, an instrument shelter, a three-sided earthen bunker with concrete inner walls clad with metal armor plate, numerous concrete pads and rubble, an underground conduit system for running test wires, and numerous other test structures. Many of these features have been removed (Chapter 4.0). Table 2.1-1 presents individual descriptions for 60 features located at SWMUs 8 and 58 and relates them to the site maps (Figures 2.1-3 through 2.1-7). These features will be referred to by the SWMU number followed by the feature letter (for example, SWMU 8, Feature Y will be referred to as SWMU 8Y) in the text of this document.

SWMU 8 primarily contained general refuse (cardboard, paper, wood, etc.) and demolition debris. SWMU 8Y (Quadrant C, Figure 2.1-6) is the only area of heavy debris found at SWMU 8. The remainder of the site contained isolated debris and test fixtures. Burned electronic debris and metals, as well as soil contaminated with heavy metals and radionuclides, were found at SWMUs 8PP and 8RR (Area of Open Burning) (Quadrant C, Figure 2.1-6) in the southeastern corner of the site. The SWMU 8Y debris pile contained solid waste primarily consisting of wood from explosives packing crates and scrap metal (Figures 2.1-8 and 2.1-9). Smaller amounts of test debris, unexploded ordnance (UXO), plastic, wires, concrete, miscellaneous cans and bottles, asbestos-containing material (ACM), insulation material, high-temperature ceramic firebricks, expended rocket motors, high explosives (HE), and ceramic insulators were also present. All the SWMU 8 debris was removed during a series of investigations and remedial activities conducted from 1996 to 2004, as presented in this CAC proposal. Several test features, including SWMU 58A (Quadrant C, Figure 2.1-6) and the mound around the northeastern side of SWMU 8Y (Quadrant C, Figure 2.1-6) were left in place.

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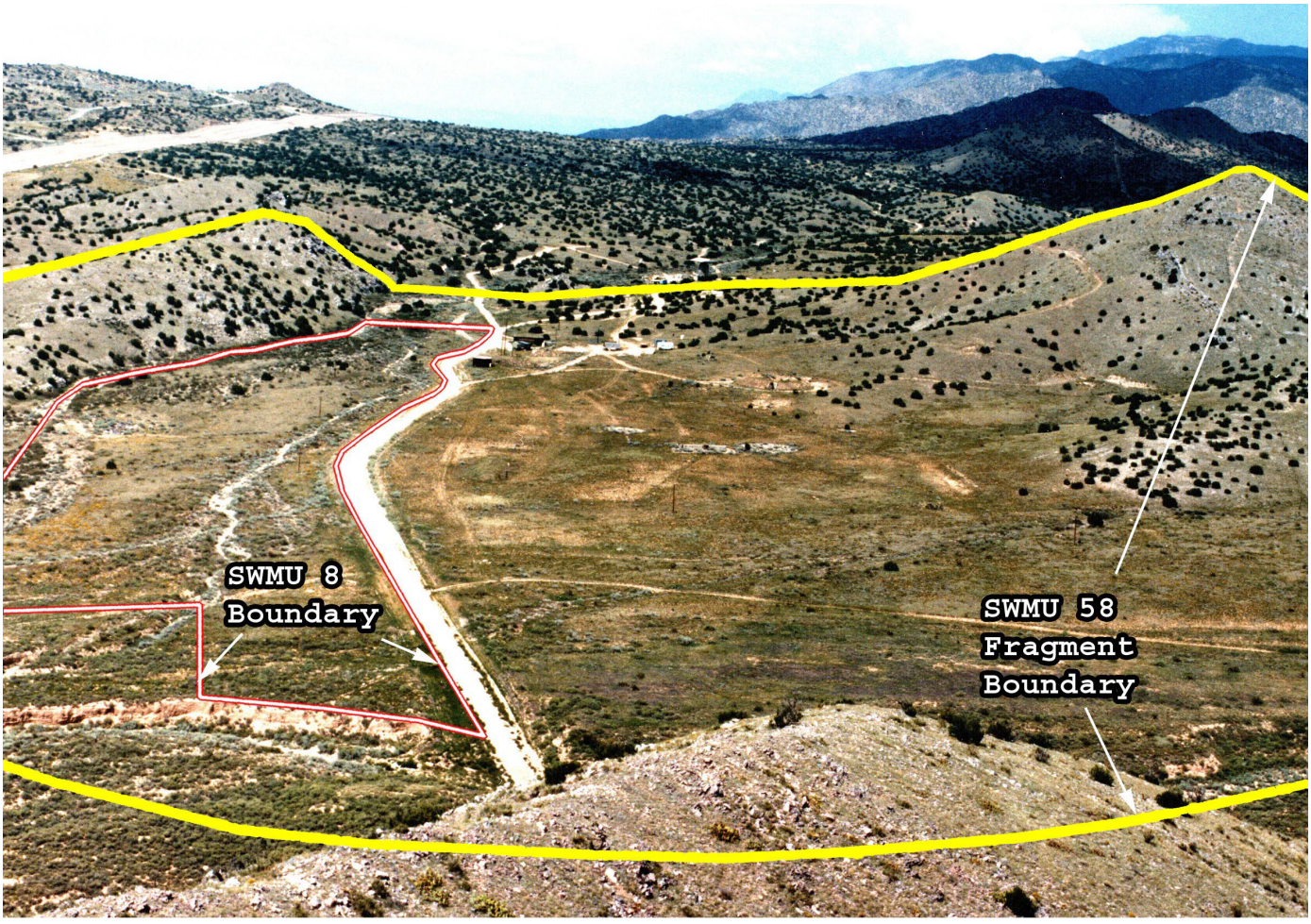

Figure 2.1-2
Photograph of Solid Waste Management Units 8 and 58. View to the north

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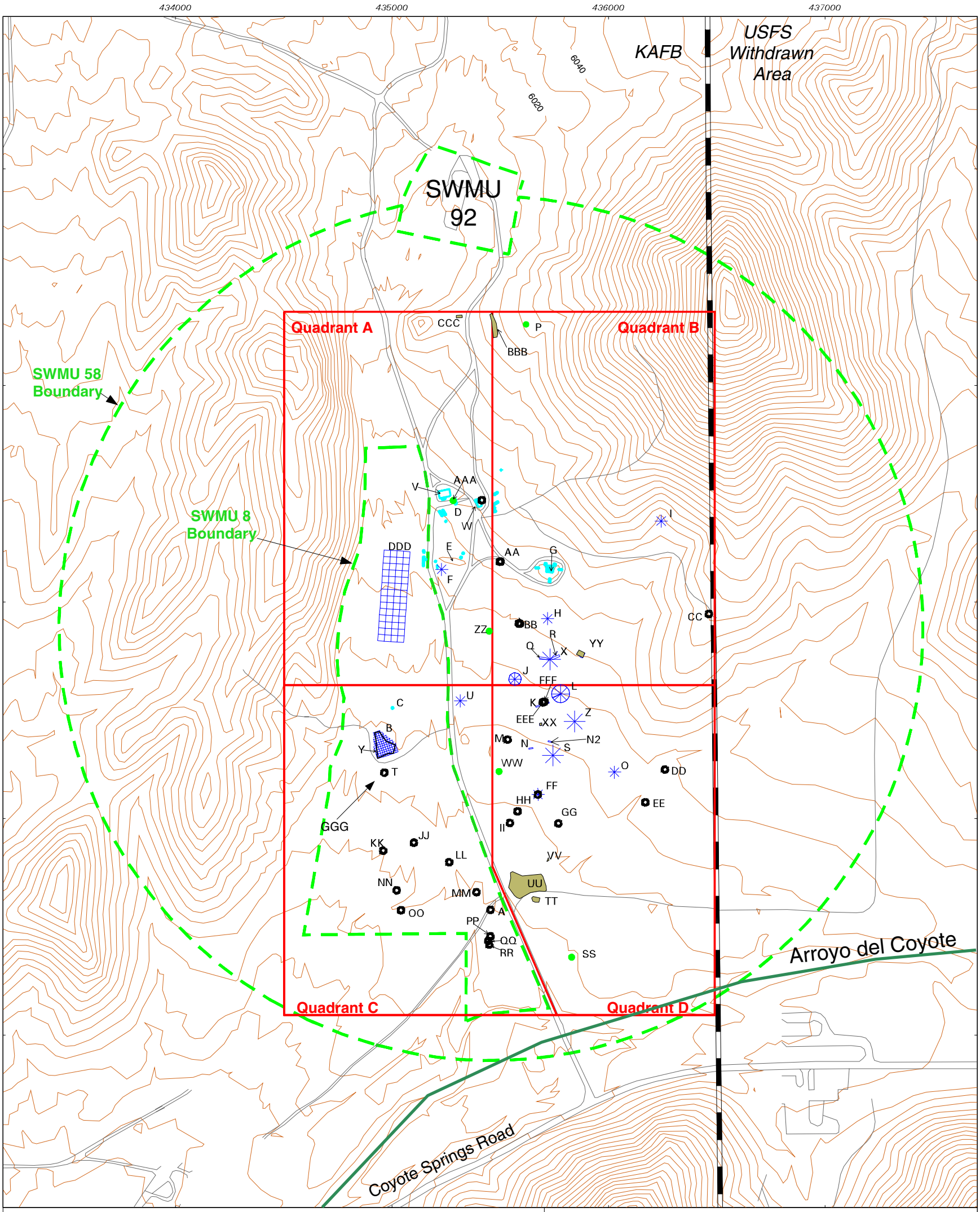

Legend

- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- Feature Identified during Field Investigation (described in Table 2.1-1)
- 10-Foot Contour
- KAFB Boundary
- KAFB Road
- SWMU Boundary
- Quadrant Boundary
- Building / Physical Feature
- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- Larger feature Identified during Field Investigation (described in Table 2.1-1)
- Arroyo del Coyote
- Sampling Locations along Radial Pattern

0 500 1000

Scale in Feet

0 120 240

Scale in Meters

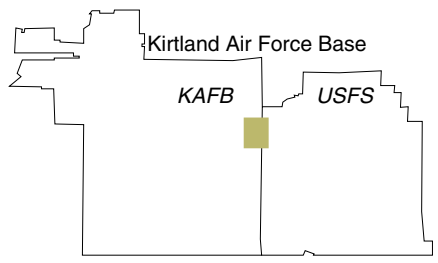

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Figure 2.1-3
Map of SWMUs 8 and 58
Features shown in
Quadrants A, B, C, and D

Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone
1927 North American Horizontal Datum, 1929 North American Vertical Datum

Unclassified	MAPID mb050049.id SNL GIS ORG. 6135	
D.Helfrich	dh010325.aml	03/28/01

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Table 2.1-1
SWMU 8 and SWMU 58 Features

Feature Location (on Figure 2.1-3)	Description	Approximate Size (if applicable)	Quadrant Map/ Figure Number[a]
58A[b]	Three data transmission cables extending out of the ground between two I-beams.	5-ft-high I-beams	Quadrant C/ Figure 2.1-6
58B	Pit filled with wooden debris.	20 x 30 x 5 ft	Quadrant C/ Figure 2.1-6
58C[b]	Pit lined with 18 in. concrete blocks bolted together with metal plates. Soil is mounded to the top of block exterior, interior filled with dirt and tumbleweeds. Built to protect instrumentation during the Greenhouse tests.	7 x 7 x 3 ft	Quadrant C/ Figure 2.1-6
58D[b]	Underground bunker, opening to the west (Building 9800).	50 x 30 x 15 ft	Quadrant A/ Figure 2.1-4
58E	Soil mound with buried debris.	150 x 40 x 15 ft	Quadrant A/ Figure 2.1-4
58F	Former location of Shot Tank, currently level with some concrete debris on surface. Mound is located directly to the north of former Shot Tank.	50 ft in diameter	Quadrant A/ Figure 2.1-4
58G	U-shaped earthen bunker used to conduct HALO tests. The bunker has sloped concrete interior walls clad with metal armor plate surrounding the test area. Test area walls have instrumentation ports in each of the three sides. The north side of the bunker is open.	10 x 10 ft at interior base, 12 ft high	Quadrant B/ Figure 2.1-5
58H	Small pit and borrow mound.	30 x 30 x 4 ft	Quadrant B/ Figure 2.1-5
58I	Missile Trap Test location containing two shallow pits with construction debris.	North pit 70 x 50 x 6 ft; South pit 100 ft in diameter, 0 to 12 ft deep	Quadrant B/ Figure 2.1-5
58J	Concrete pad with trenches for running cable. The buried portions of cut-off telephone poles are present on the east and west edges of the pad.	70 ft in diameter	Quadrant B/ Figure 2.1-5
58K	Concrete wall with a structure constructed out of 18-in. concrete blocks bolted together with metals plates. In the center of the structure is a metal room containing control/breaker boxes and a work bench.	70 x 6 x 6 ft	Quadrant D/ Figure 2.1-7
58L	Degraded asphalt pad with vegetation growing through it.	90 ft in diameter	Quadrant D/ Figure 2.1-7
58M[b]	Small soil mound.	15 ft in diameter, 3 ft high	Quadrant D/ Figure 2.1-7

Refer to footnotes at end of table.

Table 2.1-1 (Continued)
SWMU 8 and SWMU 58 Features

Feature Location (on Figure 2.1-3)	Description	Approximate Size (if applicable)	Quadrant Map/ Figure Number[a]
58N[b]	Concrete pad with metal square brackets bolted perpendicularly to the pad. An opening is located in the center of the pad that may be a wiring/instrumentation box.	20- x 5-ft pad, 2- x 6-ft instrument box	Quadrant D/ Figure 2.1-7
58N2[b]	Concrete pad (like "N" above) with the same metal mounting areas but with no metal brackets installed.	20- x 5-ft pad, 2- x 6-ft instrument box	Quadrant D/ Figure 2.1-7
58O	Empty pit with a mound to the north, a cut-off telephone pole to the east, a horizontal metal pipe extending from the center of the pit to beyond the pit to the west, an empty open-top drum is lying on its side in the pit.	60- x 20- x 6-ft mound, 25- x 45- x 6-ft pit	Quadrant D/ Figure 2.1-7
58P[b]	Two concrete blocks of the type used for the Force-On-Structure tests.	1.5 ft each	Quadrant B/ Figure 2.1-5
58Q[b]	Degraded asphalt strip.	6 x 40 ft	Quadrant B/ Figure 2.1-5
58R[b]	Degraded asphalt strip.	6 x 40 ft	Quadrant B/ Figure 2.1-5
58S	Blast point for Force-On-Structure tests.	30 x 40 ft	Quadrant D/ Figure 2.1-7
58T[b]	Single-point radiation anomaly, small dark plastic/ceramic chunk.	1 x 1 ft	Quadrant C/ Figure 2.1-6
58U	Electromagnetic/Doppler radar test site, disturbed area.	75 ft in diameter	Quadrant C/ Figure 2.1-6
58V[b]	Trailer shelter with a sod-covered roof and wooden walls on the south and east. The shelter is open to the north and west.	70 x 50 x 20 ft	Quadrant A/ Figure 2.1-4
58W	Concrete firing bunker with a viewing slit in the south wall and metal armor on top (Building 9801).	15- x 17-ft bunker, 17- x 20-ft pad to the south	Quadrant A/ Figure 2.1-4
58X	Blast-loading-on-pavement firing point.	30 x 40 ft	Quadrant B/ Figure 2.1-5
8Y	Debris pile of mostly metal and wood.	110 x 80 ft	Quadrant C/ Figure 2.1-6
58Z	Greenhouse test-blast point.	30 x 40 ft	Quadrant D/ Figure 2.1-7
58AA	Underground conduit manhole cover.	5 ft in diameter	Quadrant B/ Figure 2.1-5
58BB	Underground conduit manhole cover.	5 ft in diameter	Quadrant B/ Figure 2.1-5
58CC[b]	End point of control cables.	NA	Quadrant B/ Figure 2.1-5
58DD[b]	Concrete corrugated sheeting debris (possibly containing asbestos).	5 ft x 5 ft	Quadrant D/ Figure 2.1-7

Refer to footnotes at end of table.

Table 2.1-1 (Continued)
SWMU 8 and SWMU 58 Features

Feature Location (on Figure 2.1-3)	Description	Approximate Size (if applicable)	Quadrant Map/ Figure Number[a]
58EE[b]	Six square concrete blocks.	1.5 x 1.5 ft	Quadrant D/ Figure 2.1-7
58FF	Pile of fire bricks. Site of the Mark 17 weapon burn test.	3 x 3 ft	Quadrant D/ Figure 2.1-7
58GG[b]	Two degraded concrete chunks.	2-ft square	Quadrant D/ Figure 2.1-7
58HH[b]	Circuit box and end of buried electrical cable.	NA	Quadrant D/ Figure 2.1-7
58II[b]	Electrical terminal board.	NA	Quadrant D/ Figure 2.1-7
58JJ	A stack of approximately ten telephone poles.	NA	Quadrant C/ Figure 2.1-6
58KK[b]	Firing cable down arroyo.	20 x 30 ft	Quadrant C/ Figure 2.1-6
58LL[b]	Large pile of rusty metal plates.	3 x 4 ft	Quadrant C/ Figure 2.1-6
58MM[b]	Electronic components.	NA	Quadrant C/ Figure 2.1-6
58NN[b]	Degraded battery.	4 in.	Quadrant C/ Figure 2.1-6
58OO	Open Borehole.	1.5 ft in diameter	Quadrant C/ Figure 2.1-6
8PP	Open burn area, electronic debris with numerous pieces of aluminum slag.	5 x 5 ft	Quadrant C/ Figure 2.1-6
58QQ[b]	Rusted metal sheet.	4 x 5 ft	Quadrant C/ Figure 2.1-6
8RR	Open burn area, electronic debris with numerous pieces of aluminum slag.	5 x 5 ft	Quadrant C/ Figure 2.1-6
58SS	Open Borehole No.1.	2 ft diameter by 6 ft deep	Quadrant D/ Figure 2.1-7
58TT	Fire Brick Area No. 2.	30 x 95 ft	Quadrant D/ Figure 2.1-7
58UU	Fire Brick Area No. 3.	130 x 130 ft	Quadrant D/ Figure 2.1-7
58VV	Fire Brick Area No. 1.	15 x 22 ft	Quadrant D/ Figure 2.1-7
58WW	Three wooden poles and metal pipe.	20 x 20 ft	Quadrant D/ Figure 2.1-7
58XX	Concrete Pad No. 2.	10 x 11 ft	Quadrant D/ Figure 2.1-7
58YY	Concrete Pad No. 1.	24 x 32 ft	Quadrant B/ Figure 2.1-5
58ZZ	Open Borehole No. 2.	3 ft diameter by 3 ft deep	Quadrant A/ Figure 2.1-4
58AAA	Building 9800 Dry Well.	3 ft wide by 6 ft long by 4 ft deep	Quadrant A/ Figure 2.1-4

Refer to footnotes at end of table.

Table 2.1-1 (Concluded)
SWMU 8 and SWMU 58 Features

Feature Location (on Figure 2.1-3)	Description	Approximate Size (if applicable)	Quadrant Map/ Figure Number[a]
58BBB[b]	Scrap Metal.	50 x 20 ft area	Quadrant B/ Figure 2.1-5
58CCC	Building 9805 Drainpipe.	20 x 30 ft	Quadrant A/ Figure 2.1-4
8DDD	Explosive Contaminated Area.	120 x 420 ft	Quadrant A/ Figure 2.1-4
58EEE	Underground Conduit Manhole cover.	5 ft in diameter	Quadrant D/ Figure 2.1-7
58FFF	Underground Conduit Manhole cover.	5 ft in diameter	Quadrant D/ Figure 2.1-7
8GGG	Arroyo Area.	20 x 40 ft	Quadrant C/ Figure 2.1-6

[a]Geographical coordinates of feature are provided in the SNL/NM ES&H and Security Records Center.
[b]Site consisted of 1) minor debris, wires, concrete, etc.; 2) a small mound or area of asphalt or concrete; 3) a small radiological item that was surveyed and removed; 4) electrical debris that was removed; or 5) a decommissioned structure. This site required no RFI investigation.

ES&H = Environmental Safety and Health.
ft = Foot (feet).
in. = Inch(es).
NA = Not applicable.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

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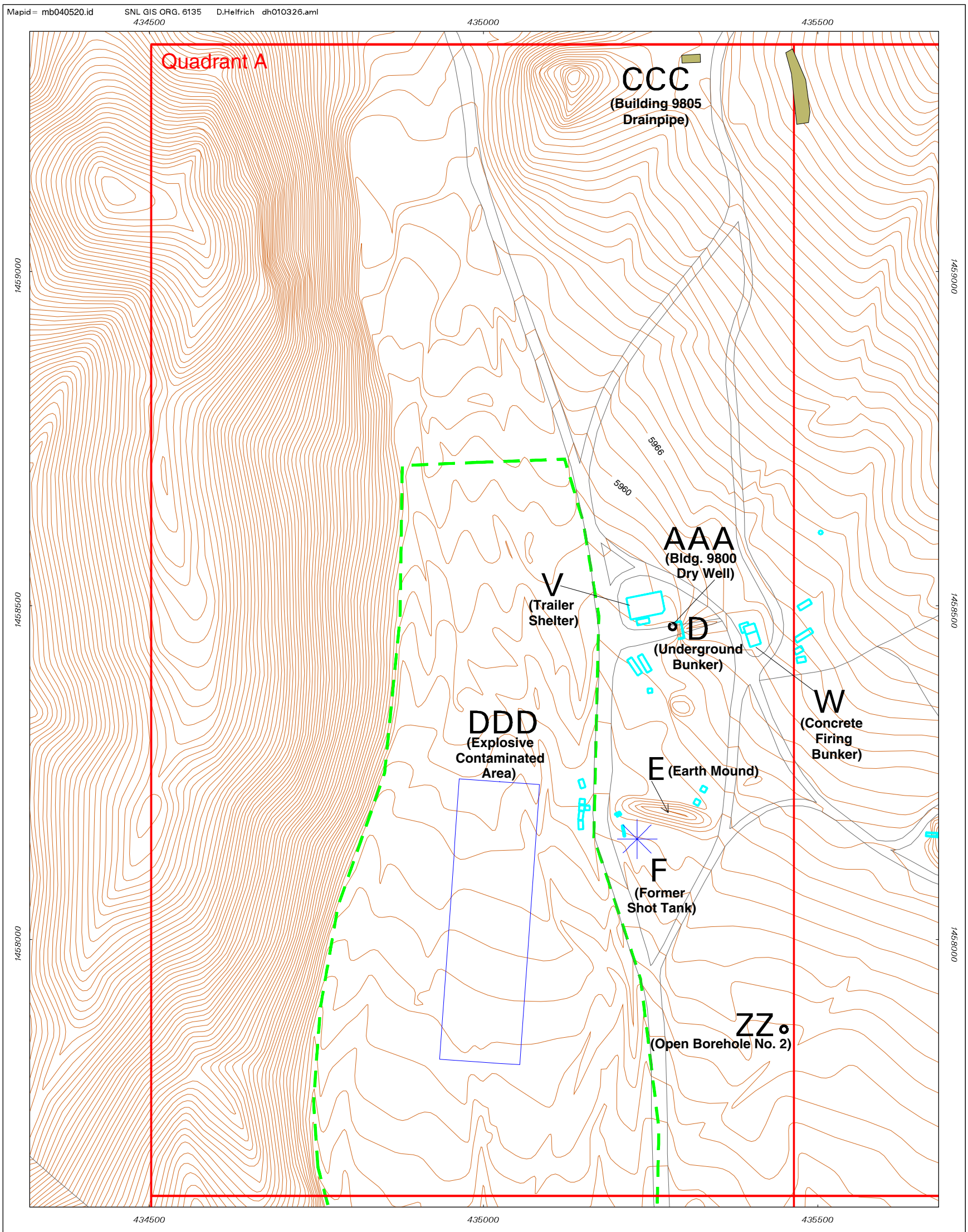

Legend

- Feature Identified during Field Investigation (described in Table 2.1-1)
- 2-Foot Contour
- Unpaved Road
- SWMU 8 Boundary
- Quadrant Boundary
- Building / Physical Feature
- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- Feature Identified during Field Investigation (described in Table 2.1-1)
- Sampling Locations along Radial Pattern

Figure 2.1-4
Features Investigated in Quadrant A, SWMUs 8 and 58

0 160 320
Scale in Feet
0 38 76
Scale in Meters

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Environmental Geographic Information System

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435500 436000 436500

1459000 1458500 1458000

Quadrant B

P (Concrete Blocks)

BBB (Scrap Metal)

I (Missile Trap Test)

AA (Manhole Cover)

G (HALO Bunker)

5948

5944

BB (Manhole Cover)

H (Small Pit and Borrow Mound)

CC (End Point of Control Cables)

R (Degraded Asphalt Strip)

Q (Degraded Asphalt Strip)

YY (Concrete Pad No. 1)

X (Firing Point)

J (Concrete Pad)

435500 436000 436500

Legend

- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- 2-Foot Contour
- Unpaved Road
- SWMU 8 Boundary
- KAFB Boundary
- Quadrant Boundary
- Building / Physical Feature
- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- Feature Identified during Field Investigation (described in Table 2.1-1)
- Sampling Locations along Radial Pattern

Figure 2.1-5
Features Investigated in Quadrant B, SWMU 58

0 160 320
Scale in Feet

0 38 76
Scale in Meters

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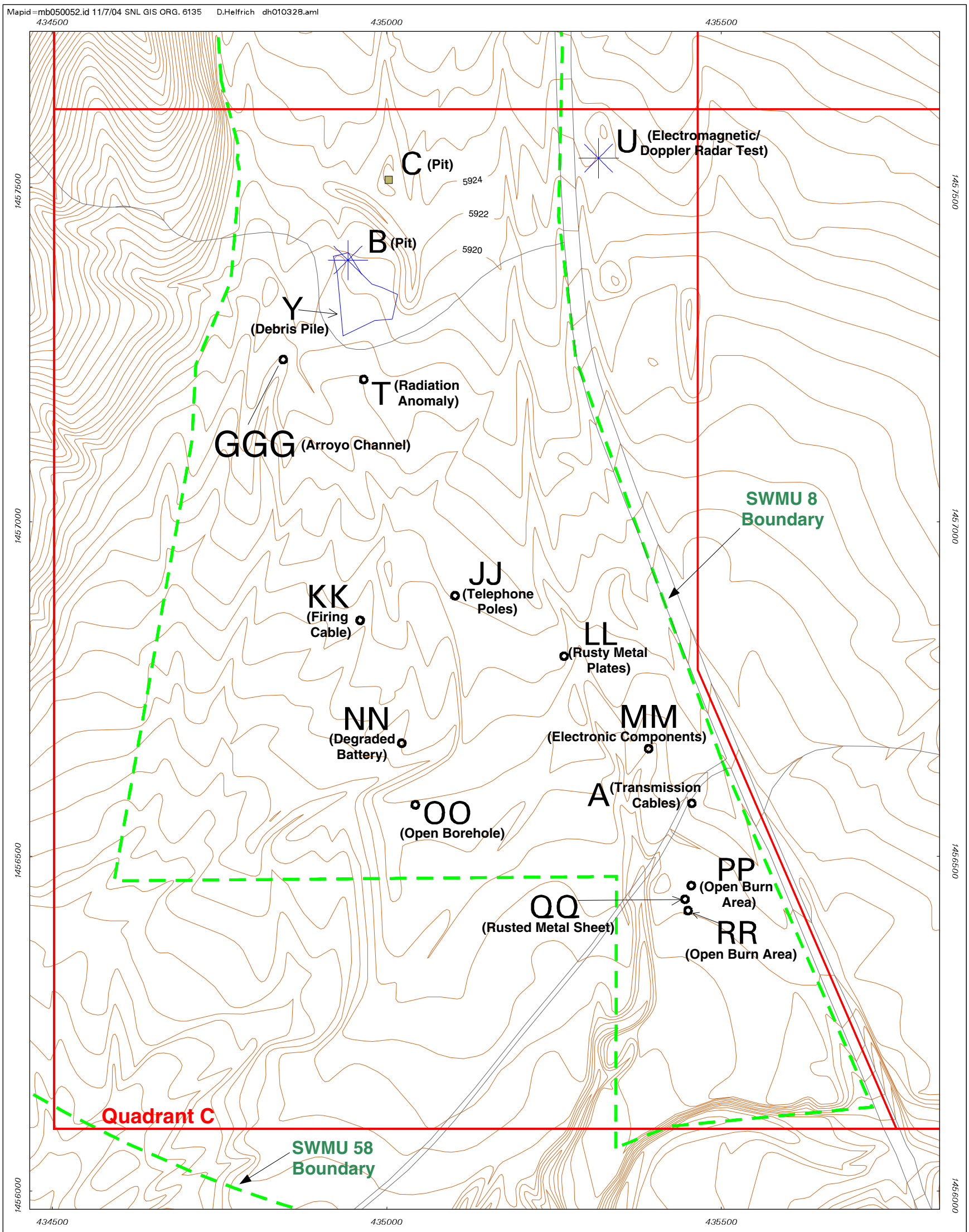

Legend

- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- 2-Foot Contour
- Unpaved Road
- SWMUs 8 and 58 Boundary
- KAFB Boundary
- Quadrant Boundary
- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- Feature Identified during Field Investigation (described in Table 2.1-1)
- Sampling Locations along Radial Pattern

Figure 2.1-6
Features Investigated in Quadrant C, SWMUs 8 and 58

0 160 320
Scale in Feet
0 38 76
Scale in Meters

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Environmental Geographic Information System

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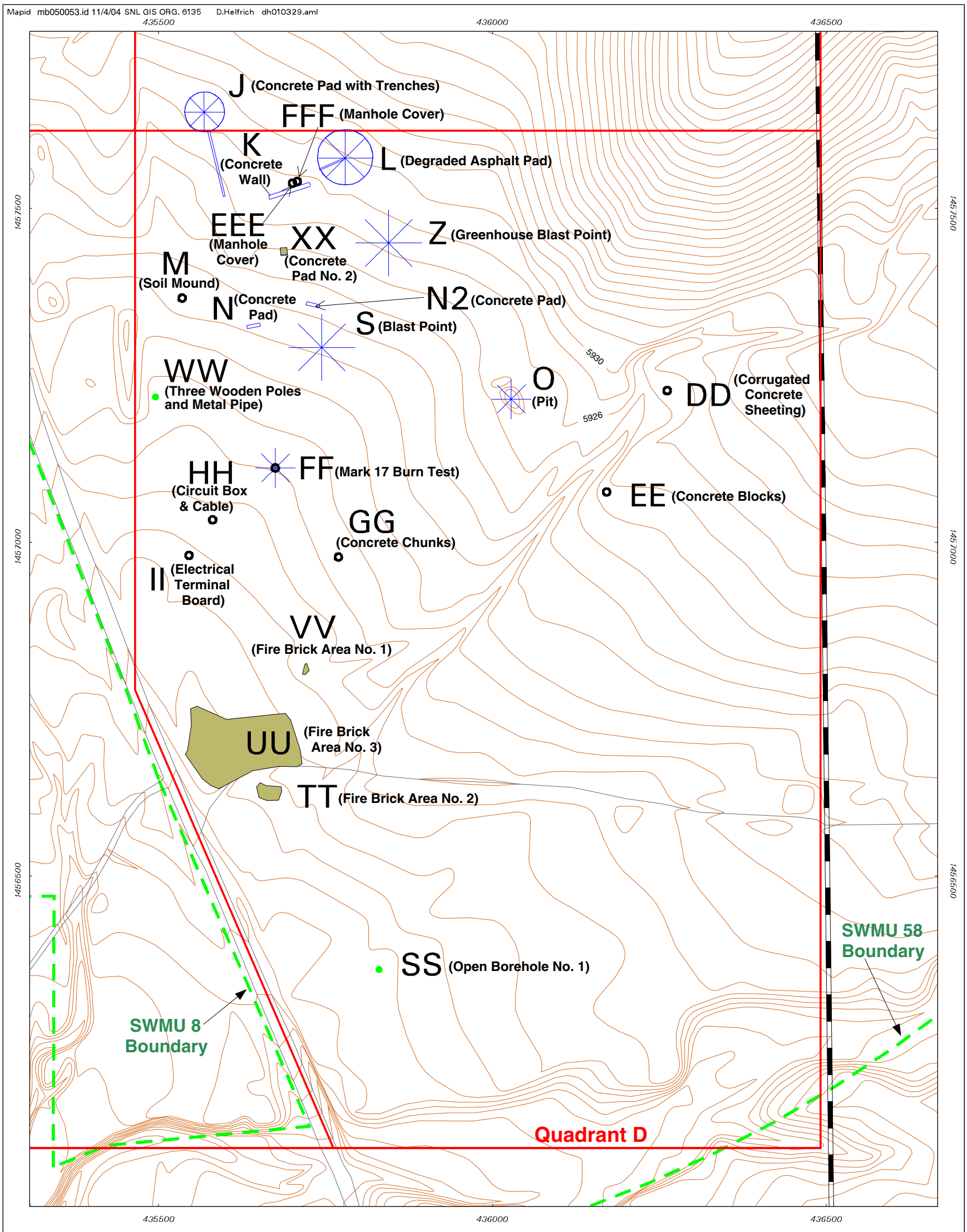

Legend

- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- Feature Identified during Field Investigation (described in Table 2.1-1)
- 2-Foot Contour
- Unpaved Road
- SWMUs 8 & 58 Boundary
- KAFB Boundary
- Quadrant Boundary
- Feature addressed in the OU 1332 Work Plan (described in Table 2.1-1)
- Feature Identified during Field Investigation (described in Table 2.1-1)
- Sampling Locations along Radial Pattern

Figure 2.1-7
Features Investigated in Quadrant D, SWMU 58

0 160 320
Scale in Feet
0 38 76
Scale in Meters

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Environmental Geographic Information System

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Figure 2.1-8
Pre-cleanup photograph of wooden debris at Features 8Y and 58B.
View is to the south.

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Figure 2.1-9

Pre-cleanup photograph of metal debris at Features 8Y and 58B.

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2.2 Operational History

More than a hundred tests have occurred at SWMUs 8 and 58, and test debris and fixtures remain at numerous locations. Neither site is currently being used for test activities. From 1950 to the late 1960s, at various locations within SWMU 58, numerous SNL/NM research groups conducted tests involving at-ground or above-ground explosive detonations (SNL/NM June 1995). Penetration tests commenced after this time but did not involve any hazardous materials. Table 2.2-1 lists the known tests conducted, the approximate periods of time during which the tests were conducted, the explosives/materials used, the materials dispersed by the tests, and the test locations (shown in Figures 2.1-4 through 2.1-7). Nonhazardous materials (such as aluminum, steel, iron, wood, concrete, and copper wire) are not listed because their presence did not affect the sampling program. Other unknown tests were conducted at SWMU 58, which may have dispersed other materials onto the site.

Prior to the penetration tests, the primary materials dispersed at the sites from the HE combustion by-products and associated testing materials were metals and radionuclides. Chunks of partially combusted HE were found at SWMU 8DDD. Emissions from the combustion of explosives would have been primarily gaseous and would have dissipated. Solid residues may have been produced by explosives containing metals, such as barium from Baratol. Carbon tetrachloride was alleged to have been poured into the Underground Conduit System (UCS) (SWMUs 58AA and 58BB) to displace water before the tests were performed. Jet propellant, grade 4 (JP-4) fuel was released to the ground during burn tests. Metals also were dispersed during some tests. ACM was found at various locations scattered throughout SWMUs 8 and 58. Gaseous argon was released during the HALO experiments and readily dispersed into the atmosphere during the testing.

Debris from the SWMU 58 tests and possibly debris from other sources was disposed of at SWMU 8. Documented tests at SWMU 58 involved large quantities of bulk explosives, which were typically shipped in wooden crates. These wooden crates, along with scrap metals from the tests, comprised most of the solid waste found at SWMU 8.

SWMU 8 and portions of SWMU 58 are located within the Manzano Combat Range, an area where KAFB military training is periodically conducted. Most of the UXO occasionally found on site results from this ongoing activity rather than past SNL/NM research activities.

2.3 Constituents of Concern

The COCs for SWMUs 8 and 58 consist of the following:

- Metals (primarily arsenic, barium, beryllium, lead, mercury, and nickel)
- Volatile organic compounds (VOCs)
- Semivolatile organic compounds (SVOCs)
- Asbestos
- HE compounds (plastic explosives, blasting material, and rocket propellants)
- Petroleum fuels (gasoline, kerosene, and JP-4)
- Radionuclides (primarily depleted uranium [DU], thorium-232, cesium-137, and tritium)

Table 2.2-1
Research Tests Conducted at SWMUs 8 and 58

Research Test Name/Type	Test Date	Hazardous Materials Used[a]	Potential Contaminants Dispersed	Quadrant Map/Figure Number[b]
Cased Explosives Detonated at Ground Level				
Electromagnetic/ Doppler Radar	1953	Weapons case and 5,000 lb TNT[c]	HE combustion by-products	58U Quadrant C/ Figure 2.1-6
HALO	1959–1965	Argon gas and 50 lb TNT, Composition B and C[c]	HE combustion by-products	58G, 58H Quadrant B/ Figure 2.1-5
Tank Shots	1960s	250 lb or less TNT[c]	HE combustion by-products	58F Quadrant A/ Figure 2.1-4
Glovebox	1960s	Black powder, TNT, dynamite or Composition 4 (lunch-box size)[c]	HE combustion by-products	58G, 58H Quadrant B/ Figure 2.1-5
Explosively Driven Flyer Plates	1960s	Lead, 200–2,000 lb Composition 4, RDX[c]	HE combustion by-products, lead	58G Quadrant B/ Figure 2.1-5
Burn Tests				
Burn Tests	1958	Simulated weapons components, JP-4 and 5,000 lb TNT[c]	HE combustion by-products, JP-4	58B, 58FF, 58I, 58O Quadrants B, C, and D, Figures 2.1-5, 2.1-6, and 2.1-7
Uncased Explosives Detonated at Ground Level				
Force on Structure (Greenhouse)	1950–1953	11,500 TNT (13,000 DNT)[c,d]	HE combustion by-products	58S, 58Z Quadrant D/ Figure 2.1-7
Blast Loading on Pavement	1954	256 lb TNT[c]	HE combustion by-products	58Q, 58R, 58X Quadrant B/ Figure 2.1-5
Uncased Explosives Detonated above Ground Level				
Height of Burst	1950–1953	1 to 256 lb Composition C/TNT[c]	HE combustion by-products	58J, 58L Quadrants B and D, Figures 2.1-5 and 2.1-7
Hill and Dale	Mid-1950s, early 1960s	8 to 256 lb TNT[c]	HE combustion by-products	Probably at 58J Quadrant B/ Figure 2.1-5
Operation Greasy Stick	1950s–1960s	8 to 256 lb TNT	HE combustion by-products	58J Quadrant B/ Figure 2.1-5
Operation Fireball	1961	5,000 lb TNT	HE combustion by-products	Unknown, probably at 58J or 58L Quadrants B and D, Figures 2.1-5 and 2.1-7

Refer to footnotes at end of table.

Table 2.2-1 (Concluded)
Research Tests Conducted at SWMUs 8 and 58

Research Test Name/Type	Test Date	Hazardous Materials Used[a]	Potential Contaminants Dispersed	Quadrant Map/Figure Number[b]
Miscellaneous Tests				
Shock Tube	Before 1956	Aluminum powder, possibly gasoline[c]	Aluminum oxide	Quadrant D/ Figure 2.1-7
Rocket Impact	1957	Rocket propellant <100 lb each, plus 200 lb HE	HE combustion by-products/UXO	Quadrant D/ Figure 2.1-7
Underground Containment	1961	8 lb TNT[c]	HE combustion by-products	Unknown
Fluorescein Sodium Tracer Test	1950s–1960s	8 lb Composition C	HE combustion by-products	58K Quadrant D/ Figure 2.1-7
Overpressure	1960s	2–10 lb TNT[c]	HE combustion by-products	Unknown
Tailpipe	1950s–1960s	250 lb TNT	HE combustion by-products	Quadrant D/ Figure 2.1-7
Penetrator Davis Gun	mid-1960s	None[c]	None	58DD, 58EE Quadrant D/ Figure 2.1-7

[a]Explosive quantities listed are per test.
[b]Geographical coordinates of feature are provided in the Long Term Environmental Stewardship records that are archived in the SNL/NM ES&H and Security Records Center.
[c]Numerous tests of this type occurred.
[d]Largest explosive quantity used in a single test.
DNT = Dinitrotoluene.
ES&H = Environmental Safety and Health.
HE = High explosive(s).
JP-4 = Jet Propulsion Fuel No. 4 (kerosene).
lb = Pound(s).
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
TNT = Trinitrotoluene.
UXO = Unexploded ordnance.

2.4 Prior Waste Disposal/Cleanup Activities

During SNL/NM research activities, various wastes were dumped at locations scattered throughout SWMU 8. In addition, small piles of construction debris were present at features throughout the site (SWMUs 58I, 58DD, 58FF, 58GG, 58TT, 58UU, and 58VV shown in Figures 2.1-5 and 2.1-7). Explosives experts removed HE fragments after tests were performed. Other cleanup activities have also occurred, although no documentation could be found other than interviews of the personnel involved. During the Preliminary Site Investigation (PSI) in 1993, KAFB Explosive Ordnance Disposal (EOD) personnel surveyed the area and collected two dump-truck loads of surficial items containing potential UXO/HE.

Following the cleanup activities conducted prior to the ER Project activities, another UXO survey was performed in 1993. Live ordnance and ordnance debris were found, including ordnance shipping containers, bomb fuses, trip flares, cartridges with primer, 5 pounds (lbs) of partially burned HE, rocket motors, and smoke grenades. These materials were subsequently removed and destroyed at the EOD Range.

3.0 LAND USE

This chapter addresses the current and future land-use scenarios for SWMUs 8 and 58.

3.1 Current Land Use

The current land-use classification for SWMU 8 and most of SWMU 58 is industrial. The eastern portion of SWMU 58 that extends into Forest Service Withdrawn Lands is classified for recreational land use.

3.2 Future/Proposed Land Use

The projected land use for SWMU 8 and most of SWMU 58 is industrial (DOE et al. October 1995). A small portion of SWMU 58 that extends into Forest Service Withdrawn Lands is classified for a recreational land-use scenario. However, because the locations of all the test activities and major debris areas are not located on Forest Service land (Figure 2.1-3), the industrial land-use scenario is used for the risk assessment analysis presented in Annex A.

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4.0 INVESTIGATORY ACTIVITIES

SWMUs 8 and 58 have been characterized and remediated during a series of investigations and Voluntary Corrective Measure (VCM)/Voluntary Corrective Action (VCA) activities. This chapter describes these activities in detail.

4.1 Summary

SWMUs 8 and 58 were initially investigated under the DOE's Phase 1 Comprehensive Environmental Assessment and Response Program (CEARP) (DOE September 1987) (Investigation 1) and the Resource Conservation and Recovery Act (RCRA) Facility Assessment (EPA April 1987). These investigations included visual inspections of the site and review of records that are summarized in Section 4.2.

Preliminary investigations conducted by the SNL/NM ER Project for SWMUs 8 and 58 included personnel interviews; site inspections; review of site photographs; and radiological, UXO/HE, cultural resources, and sensitive species surveys (Investigation 2). The details of these investigations are discussed in Section 4.3. In addition, Section 4.3 addresses housekeeping and VCM activities conducted prior to the RCRA Facility Investigation (RFI) sampling.

SWMUs 8 and 58 were characterized during a series of sampling events conducted between 1995 and 2001 as part of the RFI (Investigation 3). The details of the sampling efforts and analytical results are discussed in Section 4.4.

VCM and VCA activities were conducted between 1996 and 2004 to remove surface and buried contaminated soil and wastes (Investigation 4). Housekeeping activities were conducted during this same period to remove general debris (e.g., concrete, wood, metal) and shrapnel. The details of the VCM, VCA, and housekeeping activities are discussed in Section 4.5.

4.2 Investigation 1—CEARP

4.2.1 Nonsampling Data Collection

SWMU 58, the Coyote Canyon Blast Area, was identified as a potential site during the investigation conducted under the CEARP (DOE September 1987). The CEARP Phase I report stated that:

> In the early days of Sandia, there were three primary (Areas X, Y, and Z) and one secondary (Area W) high-explosive test areas. The northern area (Area X) is now known as the Coyote Canyon Blast Area (Site 58). Various explosive tests and uranium destruction tests were conducted in this area, including at least one large explosive test in 1951 (DOE August 1985).
>
> In the 1950s, Sandia conducted experiments at the Coyote Canyon blast site in support of the Model Blast Effects Program. The program was designed to investigate blast loading of structures using high-explosives techniques. Early in 1953, a study was conducted to compare the results of shock wave measurements from scaled-down TNT shots with those of nuclear

detonations at the NTS. A 11,500-lb (5,220-kg) TNT charge was constructed of four tiers of stacked TNT blocks, placed on a 20-ft (6-m) wooden support tower, and detonated. The shock wave was measured at various locations in a stacked concrete block structure located near the firing site. The concrete block structure was constructed to represent a scale model of the test structures at the NTS (DOE August 1985).

Further tests were conducted using smaller models and charges. Blast waves were created by detonating 250-lb (110-kg) spherical charges of TNT at heights of 38, 64, and 90 ft (12, 20, 27 m) above the ground surface. Structural models were constructed to stimulate various building heights and were placed on a concrete pad/sidewalk, and the blast waves were measured (DOE August 1985).

Later, the Coyote Canyon blast area was used for some burn tests (the Pagoda site - - small burn pits with insulation covered stakes) and some high explosives (primarily TNT) testing conducted in a large steel tank (DOE August 1985). Abandoned structures in the area include a bunker, a collapsed wooden platform, and an old building on the top of the hill above the site. The area is crossed with numerous underground cable conduits with surficial access.

Several old underground storage tanks formerly used to store gasoline are located in this area. One tank is located about 300 to 400 yd (275 to 365 m) east of the large steel tank, one is located behind the bunker, and another is located about 200 to 250 ft (60 to 80 m) east of building 9800 (DOE August 1985). There are no known leaks or spills associated with these tanks.

During the PSI, a large amount of TNT and other explosives were observed scattered throughout this area. There is also a large amount of shrapnel, some of which may contain lead, beryllium, and/or depleted uranium. Personnel from the KAFB EOD group surveyed the dump and hillside west of the road and collected two dump truck loads of explosive materials for disposal. The eastern side of the road around the concrete blocks and pad, the burn pits, and the tank may still have scattered high explosives. No tests were conducted for barium, a common ingredient in many old explosives. The hilltop building is reported to contain asbestos waste.

SWMU 8, the Open Dump (Coyote Canyon Blast Area), was identified as a potential site during the investigation conducted under the CEARP (DOE September 1987). The CEARP Phase I report stated that:

Waste from explosives tests at the Coyote Canyon blast area was discarded in an open dump west of the road to the Pendulum site (Site 8). There are no records on the disposal site; however, visible items include mostly wood (high-explosive packing crates), insulation materials (from burn tests), miscellaneous cans and bottles, and high explosives. Trinitrotoluene (TNT) was the high-explosive compound commonly used at this test site; however, baratol and other high-explosive compounds may also be present. Some depleted uranium from test activities may also have been placed in the dump.

During the PSI, it was noted that pieces of high-explosives and old rocket motors (with some of the explosives remaining) were also scattered around the dump and down the arroyo. KAFB personnel were notified, and a team from KAFB Explosive Ordnance Disposal (EOD) group surveyed the area and collected surficial items containing potentially explosive materials. Samples of the insulation materials at the dump were also collected during the PSI and were analyzed for asbestos. No asbestos was detected. Other materials in the dump have not yet been identified.

4.2.2 Sampling Data Collection

No soil sampling activities were conducted at SWMUs 8 and 58 as part of the CEARP.

4.2.3 Data Gaps

No soil samples were obtained during the CEARP to determine whether hazardous materials or wastes were stored or released to the surrounding environment.

4.2.4 Results and Conclusions

The finding under the CEARP was positive for RCRA-regulated hazardous waste. The CEARP Phase I report recommended collecting additional information and conducting sampling activities to evaluate conditions at the site (DOE September 1987).

4.3 Investigation 2—Preliminary Investigations

This section describes the preliminary data collection activities conducted at SWMUs 8 and 58.

4.3.1 Background Review

A background review was conducted by the ER Project in order to collect any relevant information regarding SWMUs 8 and 58. Background information sources included interviews with SNL/NM staff and contractors familiar with site operational history and reviews of existing historical site records and reports. This background research was documented and has provided traceable references that sustain the integrity of the CAC proposal. Table 4.3.2-1 lists these information sources and cites references that were used to assist in evaluating SWMUs 8 and 58.

4.3.2 UXO/HE Survey

In October 1993, KAFB EOD conducted a surface visual UXO/HE survey of SWMUs 8 and 58 (Young and Byrd September 1994). The UXO/HE material identified and removed during this survey was associated with military training exercises conducted by KAFB and SNL/NM research activities. Material related to the military training exercises included the following:

- Live ordnance
  - Two partially filled illuminator trip flares
  - One clip of 5.56-millimeter (mm) blank ammunition
  - Two live 12-gauge practice shotgun shells
  - Two 20-mm cartridges with primer

Table 4.3.2-1
Summary of Background Information Reviewed for SWMUs 8 and 58

Information Source	Reference
Cultural resources survey	Hoagland and Dello-Russo February 1995
Sensitive species survey	IT February 1995
Radiation surveys	RUST Geotech Inc. December 1994 and SNL/NM September 1997
Aerial Photography	Aerial Photographs[a]: (Agency/Project ID/Roll #/Frame #/Date) USGS /GSRU/1 /89 /September 30, 1951 USGS /GSVDRE/3 /113/June 26, 1975 USGS /RT/1 /73 /November 28, 1951 USFS /613030/1382/176/June 30, 1983 USFS /EJA/02/133/October 24, 1961 USFS /EXG/2/275/September 25, 1971
UXO/HE survey	Young and Byrd September 1994
Visual walkover surveys and site inspections, site photographs	Mignardot March 1996, January 1999
Reports, interviews and/or site tours with SNL/NM facility personnel	RCRA Facility Investigation Work Plan for Operable Unit 1332, Foothills Test Area (SNL/NM June 1995)

[a]Aerial photographs are archived in the SNL/NM ES&H and Security Records Center.

ES&H = Environmental Safety and Health.
HE = High explosive(s).
ID = Identification.
IT = IT Corporation.
RCRA = Resource Conservation and Recovery Act.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
USFS = U.S. Forest Service.
USGS = U.S. Geological Survey.
UXO = Unexploded ordnance.

- Ordnance debris

  - Five MK-13 signal smokes (expended)
  - Five smoke grenades (expended)
  - Thirty-four 20-mm practice cartridges/projectiles (expended)
  - Six 30-mm cartridges/projectiles (expended)
  - One projectile ballistic windshield (empty)
  - Three flash tubes of powder bags (expended)
  - One 40-mm airburst cartridge (expended)
  - Four 12-gauge practice shells (expended)
  - Numerous 5.56-mm and 7.62-mm blank ammunition (expended)

UXO/HE possibly associated with SNL/NM research activities included the following:

- Live ordnance

  - Thirteen live bomb fuses

  - Partially burned HE chunks (approximately 5 lbs). The explosives came from an area in SWMU 8 later identified in the Work Plan as the "SWMU 8 Area of Explosive Contamination."

- Ordnance debris

  - Two empty, high-velocity aircraft rocket motors
  - Several pieces of a 3-inch diameter experimental rocket
  - Two empty bomb fuses
  - One empty, 6-inch experimental penetrator

Additional UXO/HE visual surface surveys were conducted by SNL/NM ER Project personnel from 1996 to 2004. The remaining UXO/HE was removed by KAFB EOD personnel.

4.3.3 Cultural Resources Survey

A cultural resources survey was conducted at SWMUs 8 and 58 in 1994; seven discrete cultural resource areas were identified at the SWMUs (Hoagland and Dello-Russo February 1995). The cultural resources are described in the following Laboratory of Anthropology Reports: LA 2334, LA 77090, LA 87431, LA 107472, LA 107473, LA 107478, and LA 107479 (Hoagland and Dello-Russo February 1995).

4.3.4 Sensitive Species Survey

A sensitive species survey and biological field investigation of SWMUs 8 and 58 were conducted in 1994. The resulting report summarizes sensitive, threatened, and endangered species found on the site and gives a comprehensive assessment of biological habitats (IT February 1995). Three sensitive species—grama grass cactus, visnagita cactus, and Wright's pincushion—were recorded at SWMU 58 (including SWMU 8).

However, since the 1994 survey, these three species have been taken off the New Mexico endangered plant list and are no longer considered sensitive plant species (NMFRCD August 1995).

4.3.5 Radiological Surveys

In October and November 1993, RUST Geotech Inc. conducted a surface gamma radiation survey at SWMU 8 (SNL/NM September 1997). Background radioactivity was measured at approximately 10 to 13 microroentgens per hour (μR/hr). One point-source anomaly was detected at a level of 994 μR/hr at SWMU 58T (Figure 2.1-6). The radioactive material appeared to be gray plastic with white veins running through it. SNL/NM Radiation Protection (RP) personnel analyzed the fragment using laboratory gamma spectroscopy and identified the radioactive component as cesium-137. It is believed that this fragment came from tests conducted at the electromagnetic/Doppler radar test site (SWMU 58U, Figure 2.1-6).

In October and November 1993, RUST Geotech Inc. also conducted a surface gamma radiation survey at SWMU 58 (SNL/NM September 1997), except for the HALO Bunker interior. Squares of thin radioactive metal were found individually or in sheets in an area centered just southeast of the HALO Bunker (SWMU 58G, Figure 2.1-5). No test history has been found to account for these fragments. The pattern of radioactive metal fragments suggests that the test that produced them may have been conducted at the HALO bunker. SNL/NM RP personnel performed an analysis of the metal fragments and found the radioactive component to be thorium-232.

In 1995, the SNL/NM ER Project conducted a VCM to remove the radioactive fragments and point sources. A detailed summary of the results of the VCM verification sampling is presented in the "Final Report, Survey and Removal of Radioactive Surface Contamination at Environmental Restoration Sites, Sandia National Laboratories/New Mexico" (SNL/NM September 1997).

4.3.6 Housekeeping and VCM Activities Prior to RFI

Prior to RFI sampling, a series of housekeeping and VCM/VCA activities were conducted at SWMUs 8 and 58 to remove debris and obvious contaminants, as discussed in detail in the OU 1332 RFI Work Plan submitted to the New Mexico Environment Department (NMED) (SNL/NM June 1995). The final VCA for SWMUs 8 and 58, discussed in Section 4.5, extensively changed the sites.

SWMUs 8Y and 58B Debris Removal/Housekeeping Activities

SWMU 8Y (Figure 2.1-6) was the main surface dump area within SWMU 8. The first step in preparing SWMU 8 for RFI sampling was to remove the surface debris from SWMU 8Y. Figures 2.1-8 and 2.1-9 show SWMU 8Y before debris removal. Housekeeping activities were conducted from February 12 to February 22, 1996. A total of 120 cubic yards of solid waste (primarily wood) and 35 cubic yards of recyclable metal were removed.

Additional materials identified during this housekeeping activity lead to further VCM activities. A small area, approximately 15 square feet within SWMU 8Y, was found to contain radioactive debris (Figure 4.3.6-1). At the end of housekeeping activities to remove bulk debris from the pit, a white material was found in the north pit wall at a depth of approximately 2 to 3 feet below ground surface (bgs). The material was found to contain elevated metals, DU, and thorium. At approximately the same time, a large jet assist takeoff (JATO) motor was uncovered at SWMU 58B (Figure 4.3.6-2). Two motors were subsequently removed. The motors measured 11 feet in length and 18 inches in diameter (Figure 4.3.6-3). Both motors had been fired and were determined to be inert by EOD personnel. Additional motors that were partially exposed during the removal of the first two motors were subsequently removed.

SWMUs 8Y and 58B Geophysical Survey

A geophysical survey using a Geonics EM-61 high-precision metal locator was conducted at SWMUs 8Y and 58B on February 26, 1996, to assess the additional buried UXO (i.e., JATO motors) and metal debris. The survey covered the SWMU 8Y area (approximately 140 by 160 feet) and a large portion of SWMU 58B (Figure 4.3.6-4). The survey found no evidence of additional buried UXO outside the visually identified motor burial area but identified several areas of metallic surface debris that were later removed.

SWMUs 8Y and 58B JATO Motor Removal

A VCM to remove the buried JATO motors was conducted from March 7 to March 11, 1996 (Mignardot March 1996). Ten JATO motors were removed, which included the two excavated earlier. All the motors had been fired and were free of explosives or radioactive contamination. Details of the RFI methods used to remove the motors are discussed in the Work Plan for the OU 1332 RFI (SNL/NM June 1995).

SWMUs 8Y and 58B Radioactive Contamination Removal

With the removal of the UXO hazard, the VCM to remove the radioactive white material was performed. Rust Geotech Inc. conducted the VCM at SWMUs 8Y and 58B from July 22 to July 29, 1996 (SNL/NM September 1997). Sixty-nine 55-gallon drums and two 4- by 4- by 7-foot wooden boxes of radioactive waste were generated during the VCM. The waste primarily consisted of radioactive (primarily cesium-137) wood and soil.

VCMs to remove radioactive materials on the surface from the remainder of SWMU 58 were conducted during February and March 1995 and July and October 1996. Thirty-seven 55-gallon drums of radioactive waste (primarily soil) and one drum of personnel protective equipment were generated (SNL/NM September 1997). VCM confirmatory samples were collected at ten locations within SWMU 58. The maximum activities for all samples were uranium-238 at 7.6 picocuries per gram (pCi/g), uranium-235 at 0.1 pCi/g, uranium-234 at 0.9 pCi/g, thorium-232 at 12.9 pCi/g, and radium-228 at 8.96 pCi/g.

On October 28, 1998, Environmental Restoration Group, Inc. (ERG) conducted a surface radiation survey at various areas within SWMU 58 (ERG October 1998). This survey covered the location where an anomaly was identified by RUST Geotech, Inc. in 1995–1996; specifically,

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Figure 4.3.6-1

Pre-cleanup photograph of the former Radioactive Material Area (RMA) at Feature 8Y.

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Figure 4.3.6-2

Pre-cleanup photograph of the radioactive white material and Jet Assist Take Off (JATO) motor at the Feature 58B pit.

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Figure 4.3.6-3

Cleanup photograph of two Jet Assist Take Off (JATO) motors found at Features 8Y and 58B.

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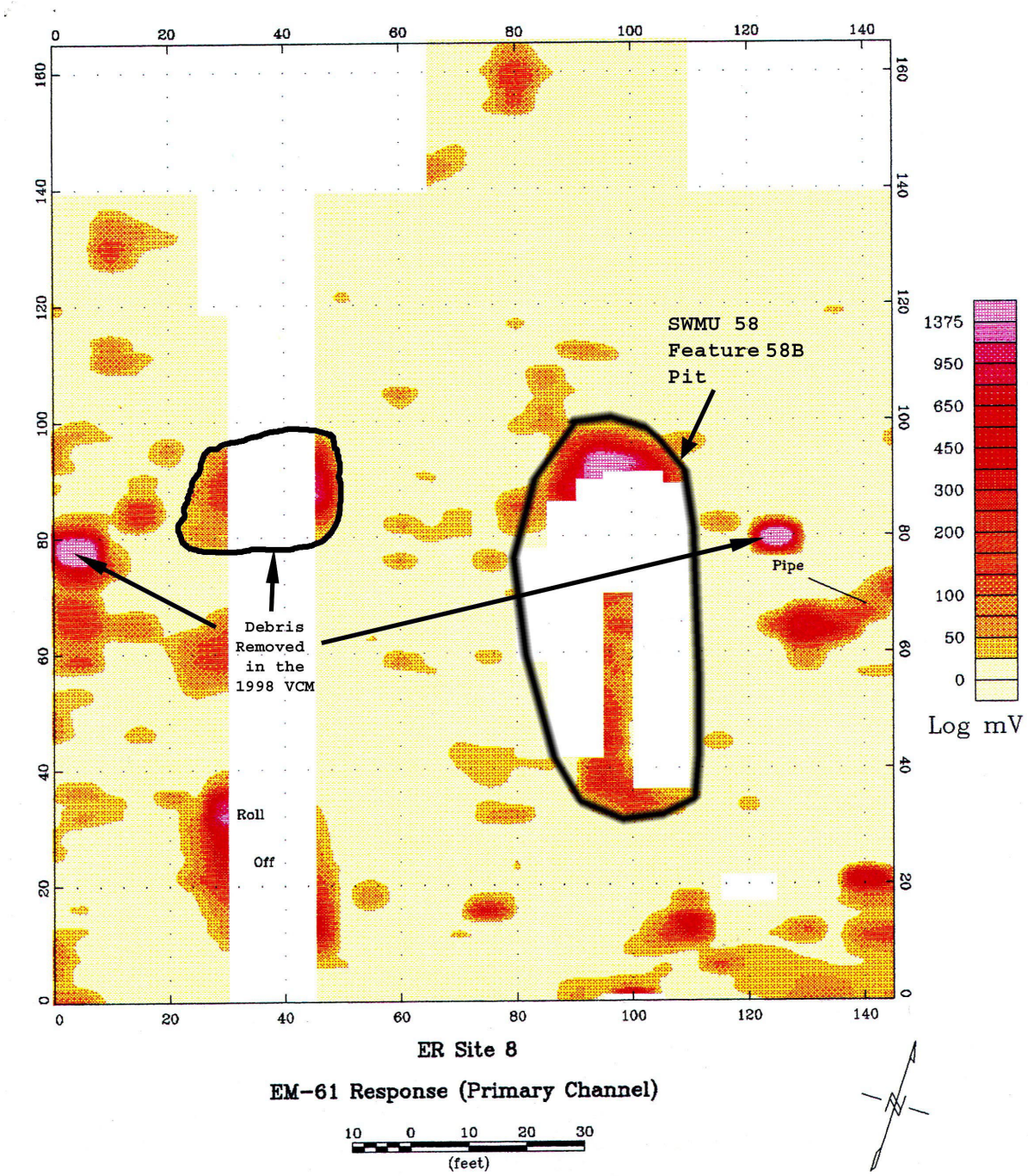

Figure 4.3.6-4
Pre-cleanup geophysical survey at Features 8Y and 58B.

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the anomaly that had an elevated thorium activity discussed in the preceding paragraph. Results from the ERG survey did not identify any elevated activity at this location. Therefore, the elevated thorium activity was likely a radioactive particle that may be related to the fragments discussed in Section 4.3.5.

4.3.7 Sampling Data Collection

Twenty-five samples, including four duplicates, were collected for gamma spectroscopy analysis during the survey and VCM removal of radioactive surface contamination at SWMUs 8Y and 58B conducted by Rust Geotech Inc. The sample results are discussed in the final report (SNL/NM September 1997) but were not incorporated into the risk assessment analysis for SWMUS 8 and 58 (Annex A) because the soil sampled in 1995 and 1996 was subsequently removed during the VCM in 1998 and 1999 (Section 4.5). The 1995 and 1996 analytical results are summarized in Annex B.

4.3.8 Data Gaps

Information gathered from process knowledge, historical site files, surveys, and inspections of the site, and personnel interviews were sufficient to identify the most likely COCs, the most likely locations of potential COC releases, and the types of analyses to be performed on soil samples.

4.3.9 Results and Conclusions

Cultural resources and sensitive species concerns did not affect sampling or remediation of SWMUs 8 and 58. After the housekeeping and VCM activities were completed, no UXO/HE hazards remained at SWMUs 8 and 58. No evidence of organic COCs, such as stained soil or leaking containers, was present. The SWMU 8Y/58B area contained small pieces of debris and what appeared to be charred wood mixed in with the soil. The radiological surveys and sampling conducted at the site determined that radiation anomalies were associated with both test activities and natural bedrock.

4.4 Investigation 3—RFI Sampling Activities

This section discusses the RFI conducted at SWMUs 8 and 58. Section 4.4.1 addresses the RFI sampling activities at SWMU 8 and Section 4.4.2 address the RFI sampling activities conducted at SWMU 58. The data gaps and conclusions for all RFI sampling activities are discussed at the end of this section.

4.4.1 SWMU 8 RFI Sampling

Numerous sampling events were conducted from June 1995 to March 2004 to characterize SWMU 8. Because of the size of SWMU 8, several discrete areas or features were investigated. The areas and features (Figure 2.1.3) and corresponding sampling/investigation dates are as follows:

- Explosives Contaminated Area, SWMU 8DDD (Figure 2.1-4)—soil sampling at 14 locations in June and October 1995 and February 1998 (details discussed in Section 4.4.1.2)

- Area of Open Burning, SWMUs 8PP and 8RR (Figure 2.1-6)—soil sampling at six locations in November 1996, and at additional sample locations in July 1997, August 1998, June and July 1999, March 2000, and February 2004 (details discussed in Section 4.4.1.3)

- Arroyo Area, SWMU 8GGG (Figure 2.1-6)—soil sampling at 10 locations in November 1996 and January 1998 (details discussed in Section 4.4.1.4)

- Debris Pile and Pit, SWMUs 8Y and 58B (Figure 2.1-6)—soil sampling at 46 surface and 2 subsurface locations in April and November 1996, November 1997, and January and July 1998, and additional post-VCM sampling in September 1998 and January 1999 (details discussed in Section 4.4.1.5)

Table 4.4.1-1 provides a summary of RFI survey and sampling field activities conducted at SWMU 8. Additional fieldwork including VCM, VCA, and housekeeping activities conducted at the site are also summarized in Table 4.4.1-1. The VCM, VCA, and housekeeping activities are discussed in detail in Section 4.5.

All soil samples for SWMU 8 were collected in accordance with ER Field Operating Procedures (FOP) 94-52 and 95-23 (SNL/NM December 1994 and November 1995) using standard equipment (i.e., stainless steel bowl, hand trowel) and standard decontamination procedures in accordance with ER FOP 94-57 (SNL/NM May 1994). Samples were managed in accordance with ER FOP 94-34 (SNL/NM May 1995). SNL/NM chain-of-custody and sample documentation procedures were followed for all samples collected.

4.4.1.1 Nonsampling Data Collection

Site visits were conducted prior to RFI sampling planning. The visits confirmed site conditions and at times added features or COCs to be sampled at a given location. Samples were screened for radiation in the field using a beta/gamma meter. No elevated radiation levels were found at sample locations or on sample containers during this phase of the investigation.

4.4.1.2 SWMU 8DDD (Explosives Contaminated Area)

In October 1993, KAFB EOD personnel conducted a UXO/HE survey of SWMU 8, including the Explosives Contaminated Area (SWMU 8DDD in Figure 2.1-4). The area was called the "Explosives Area" and the "Explosives Contaminated Area" interchangeably in the OU 1332 RFI Work Plan (SNL/NM June 1995). Approximately 5 lbs of HE, broken into small chunks (Figure 4.4.1.2-1), were found in this area. The explosives were removed and destroyed at the EOD Range. This section discusses the sampling conducted for this area and the analytical results.

4.4.1.2.1 Sampling Activities at SWMU 8DDD (Explosives Contaminated Area)

Sampling was conducted at the Explosives Contaminated Area as described in Section 5.2 of the OU 1332 RFI Work Plan (SNL/NM June 1995). Fourteen sampling locations were randomly

Table 4.4.1-1
Summary of Field Activities Conducted at SWMU 8

SWMU 8 Area	Surveys/Sampling Date(s)			Housekeeping/VCM/VCA Date(s)	
	UXO/HE Survey	Radiation Survey	Soil Sampling	Nonradioactive Housekeeping Debris Removal	Radioactive VCM/ VCA Debris Removal
Explosives Contaminated Area (Feature 8DDD)[a]	October 1993	October–November 1993	June and October 1995 February 1998	December 1998–March 1999	NA
Area of Open Burning (Features 8PP/8RR)[b]	October 1993	October–November 1993	November 1996 July 1997 August 1998 June–July 1999 March 2000 February 2004	December 1998–March 1999	June 1997 August 1998 January–February 2004
Arroyo Area (Feature 8GGG)[c]	October 1993	October–November 1993	November 1996 January 1998	December 1998–March 1999	NA
Debris Pile and Pit (Features 8Y/58B)[d]	October 1993	October–November 1993	April 1996 November 1996 November 1997 January and July 1998 September 1998 January 1999	December 1998–March 1999	July 1996 September 1998

[a]Soil samples were collected from 14 randomly selected sample locations, and analyzed for metals, HE, and radionuclides by gamma spectroscopy.
[b]Confirmatory soil samples were collected from 10 judgmentally selected sample locations, and analyzed for metals and radionuclides by gamma spectroscopy.
[c]Soil samples were collected from 10 judgmentally selected sample locations, and analyzed for metals, HE, and radionuclides by gamma spectroscopy.
[d]Confirmatory soil samples were collected from 18 judgmentally selected surface sample locations and 2 judgmentally selected subsurface sample locations, and analyzed for metals, HE, VOCs, SVOCs, TPH, tritium, total uranium, and radionuclides by gamma spectroscopy.

HE = High explosive(s).
NA = Not applicable.
RCRA = Resource Conservation and Recovery Act.
SVOC = Semivolatile organic compound(s).
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.
UXO = Unexploded ordnance.
VCA = Voluntary Corrective Action.
VCM = Voluntary Corrective Measure.
VOC = Volatile organic compound(s).

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Figure 4.4.1.2-1

Pre-cleanup photograph of high explosives at the Explosives Contaminated Area (Feature 8DDD).

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selected from a sampling grid (Figure 4.4.1.2.1-1). No locations were found during sampling that showed visible evidence of COCs; therefore, no judgmental samples were added to the sampling program.

Samples were analyzed for metals by Lockheed Analytical Services (LAS), Las Vegas, Nevada; General Engineering Laboratories, Inc. (GEL), Charleston, South Carolina; and the SNL/NM on-site Environmental Restoration Chemistry Laboratory (ERCL). LAS and GEL also analyzed samples for HE compounds. The SNL/NM on-site laboratory (ERCL) screened samples for HE compounds using the high performance liquid chromatography method. Samples were analyzed for radionuclides by gamma spectroscopy at the SNL/NM Radiation Protection Sample Diagnostics (RPSD) Laboratory.

4.4.1.2.2 Sampling Results for SWMU 8DDD (Explosives Contaminated Area)

Table 4.4.1.2.2-1 summarizes the metal analytical results for the soil samples collected at the Explosives Contaminated Area. Copper was detected above the approved background limit in 8 of 14 samples. In the elevated samples, copper ranged from 17.3 to 26.9 milligrams/kilogram (mg/kg). Mercury was elevated in one sample (08-GR-055-0-SS) at 0.0624 mg/kg, compared to the background limit of 0.055 mg/kg. The method detection limits (MDLs) for silver, arsenic, cadmium, copper, mercury, and selenium for the on-site laboratory were above the approved background levels (Garcia November 1998). In all samples, except for four locations, the on-site laboratory data was replaced with off-site laboratory data by resampling. Because all the on-site laboratory data show no major contamination, the higher MDLs for on-site data are not considered significant.

Table 4.4.1.2.2-2 summarizes the results of gamma spectroscopy analysis for radionuclides. No activity above approved background levels was detected. However, the minimum detectable activity (MDA) values for uranium-238 and uranium-235 were above the approved background levels. The complete RPSD Laboratory analytical package is included in Annex C.

HE compounds were not detected in any sample at the MDLs presented in Table 4.4.1.2.2-3.

4.4.1.2.3 Data Quality Results for SWMU 8DDD (Explosives Contaminated Area)

Quality assurance (QA)/quality control (QC) field samples collected as part of the confirmatory soil sampling event included one duplicate sample for metals and one aqueous equipment blank (EB) sample.

The EB sample was collected to ensure contamination was not transferred from one sample to another via unclean sampling equipment. The EB sample was analyzed off site for metals. Metal concentrations in the sample were slightly greater than the MDLs for barium, chromium, copper, and zinc. The concentrations of barium, chromium, and copper were below the practical quantitation limit (PQL), and the results were qualified as J (estimated) during data validation. No QA/QC samples were collected for radionuclide analyses.

To assess the precision of soil sampling procedures, duplicate soil samples were collected and analyzed. Relative percent differences (RPDs) were calculated for the metals detected in the primary and duplicate samples, which were analyzed by LAS and GEL. The analyses for one of three sample pairs for arsenic, barium, chromium, and zinc yielded RPDs that exceeded the acceptable RPD limit of less than 25 percent (Table 4.4.1.2.3-1). However, the metal

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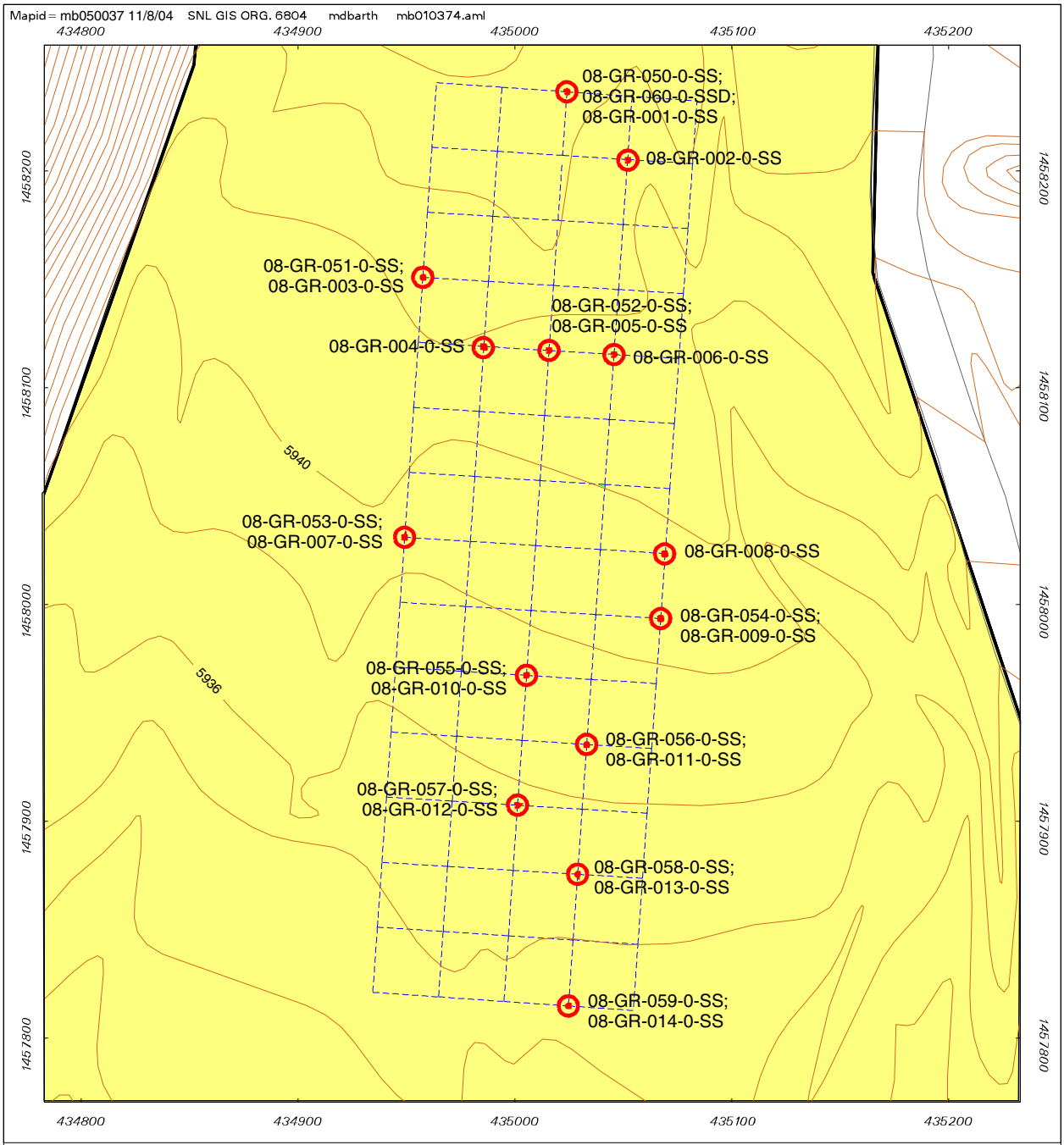

Legend

- Sampling location
- Road
- 2-Foot Contour
- Sampling Grid
- SWMU 8

Figure 4.4.1.2.1-1
Surface sample locations at
Feature 8DDD,
Explosives Contaminated Area

0 37.5 75
Scale in Feet

0 9 18
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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Table 4.4.1.2.2-1
Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling, Metals Analytical Results
October 1995 and February 1998
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010, 7000, and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
509102	08-GR-02-0-SS-02[c]	Soil	10-04-95	0–0.5	**ND (26)**	30 J (38)	ND (0.11)	**ND (2.1)**	ND (5.0)	**ND (20)**
509102	08-GR-04-0-SS-02[c]	Soil	10-04-95	0–0.5	**ND (26)**	34 J (38)	ND (0.11)	**ND (2.1)**	ND (5.0)	**ND (20)**
509102	08-GR-06-0-SS-02[c]	Soil	10-04-95	0–0.5	**ND (26)**	46	ND (0.11)	**ND (2.1)**	ND (5.0)	**ND (20)**
509102	08-GR-08-0-SS-02[c]	Soil	10-04-95	0–0.5	**ND (26)**	40	ND (0.11)	**ND (2.1)**	ND (5.0)	**ND (20)**
510266	08-GR-050-0-SS	Soil	02-02-98	0–0.5	1.5	44.3	0.350 J (0.481)	0.319 J (0.481)	7.92	16.9
510266	08-GR-051-0-SS	Soil	02-02-98	0–0.5	1.91	59.8	0.336 J (0.476)	0.407 J (0.476)	14.0	**26.9**
510266	08-GR-052-0-SS	Soil	02-02-98	0–0.5	2.09	88.5	0.404 J (0.500)	0.500	14.2	**23.9**
510266	08-GR-053-0-SS	Soil	02-02-98	0–0.5	2.21	70.6	0.393 J (0.500)	0.472 J (0.500)	12.3	**21.3**
510266	08-GR-054-0-SS	Soil	02-02-98	0–0.5	1.84	67.0	0.331 J (0.500)	0.474 J (0.500)	15.0	**18.9**
510266	08-GR-055-0-SS	Soil	02-02-98	0–0.5	1.61	76.7	0.312 J (0.476)	0.338 J (0.476)	8.13	14.8
510266	08-GR-056-0-SS	Soil	02-02-98	0–0.5	1.83	52.5	0.340 J (0.490)	0.466 J (0.490)	11.5	**19.2**
510266	08-GR-057-0-SS	Soil	02-02-98	0–0.5	1.46	59.8	0.267 J (0.476)	0.590	7.78	**17.3**
510266	08-GR-058-0-SS	Soil	02-02-98	0–0.5	2.46	84.2	0.416 J (0.476)	0.554	16.3	**20.0**
510266	08-GR-059-0-SS	Soil	02-02-98	0–0.5	1.98	78.7	0.387 J (0.500)	0.465 J (0.500)	12.5	**20.2**
510266	08-GR-060-0-SSD	Soil	02-02-98	0–0.5	1.2	44.3	0.275 J (0.485)	0.350 J (0.485)	10.8	16.0
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
510266	08-GR-061-EB	Water	02-02-98	NA	ND (0.00293)	0.000978 J (0.00500)	ND (0.000223)	ND (0.000208)	0.000963 J (0.00500)	0.00135 J (0.00500)

Refer to footnotes at end of table.

Table 4.4.1.2.2-1 (Continued)
Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling, Metals Analytical Results
October 1995 and February 1998
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010, 7000, and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
509102	08-GR-02-0-SS-02[c]	Soil	10-04-95	0–0.5	ND (3.4)	**ND (0.06)**	ND (4.0)	**ND (50)**	**ND (1.7)**	16 J (38)
509102	08-GR-04-0-SS-02[c]	Soil	10-04-95	0–0.5	ND (3.4)	**ND (0.06)**	ND (4.0)	**ND (50)**	**ND (1.7)**	20 J (38)
509102	08-GR-06-0-SS-02[c]	Soil	10-04-95	0–0.5	ND (3.4)	**ND (0.06)**	ND (4.0)	**ND (50)**	**ND (1.7)**	27 J (38)
509102	08-GR-08-0-SS-02[c]	Soil	10-04-95	0–0.5	ND (3.4)	**ND (0.06)**	ND (4.0)	**ND (50)**	**ND (1.7)**	20 J (38)
510266	08-GR-050-0-SS	Soil	02-02-98	0–0.5	5.33	0.0223 J (0.0318)	7.23	0.308 J (0.481)	0.149 J (0.481)	32.5
510266	08-GR-051-0-SS	Soil	02-02-98	0–0.5	11.6	0.0190 J (0.0322)	10.8	0.354 J (0.476)	0.186 J (0.476)	43.6
510266	08-GR-052-0-SS	Soil	02-02-98	0–0.5	9.87	0.0179 J (0.0326)	11.6	0.382 J (0.500)	0.202 J (0.500)	48.0
510266	08-GR-053-0-SS	Soil	02-02-98	0–0.5	10.2	0.0331	10.5	0.331 J (0.500)	0.213 J (0.500)	45.0
510266	08-GR-054-0-SS	Soil	02-02-98	0–0.5	7.41	0.0179 J (0.0323)	11.2	0.260 J (0.500)	0.238 J (0.500)	50.1
510266	08-GR-055-0-SS	Soil	02-02-98	0–0.5	10.4	**0.0624**	7.76	0.230 J (0.476)	0.226 J (0.476)	37.7
510266	08-GR-056-0-SS	Soil	02-02-98	0–0.5	6.17	ND (0.0173)	8.90	0.321 J (0.490)	0.178 J (0.490)	33.3
510266	08-GR-057-0-SS	Soil	02-02-98	0–0.5	9.40	0.0238 J (0.0328)	7.37	ND (0.07)	0.136 J (0.476)	35.9
510266	08-GR-058-0-SS	Soil	02-02-98	0–0.5	13.0	0.0315	10.8	0.490	0.179 J (0.476)	45.5
510266	08-GR-059-0-SS	Soil	02-02-98	0–0.5	13.2	0.0269 J (0.0321)	10.2	0.431 J (0.500)	0.191 J (0.500)	45.7
510266	08-GR-060-0-SSD	Soil	02-02-98	0–0.5	5.09	0.0190 J (0.0307)	8.39	0.300 J (0.485)	0.180 J (0.485)	36.4
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)										
510266	08-GR-061-EB	Water	02-02-98	NA	ND (0.000678)	ND (0.000104)	ND (0.00227)	ND (0.0014)	ND (0.00062)	0.0124

Refer to footnotes at end of table.

Table 4.4.1.2.2-1 (Concluded)
Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling, Metals Analytical Results
October 1995 and February 1998
(On- and Off-Site Laboratories)

Note: Values in **bold** exceed the background soil concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample analyzed at Environmental Restoration Chemistry Laboratory.
[d]Garcia November 1998.
[e]Sample 08-GR-060-0-SSD is a duplicate sample of 08-GR-050-0-SS.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J () = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface Soil Sample.
SSD = Surface soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.1.2.2-2
Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
June 1995
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
03859	08-GR-001-0-SS	Soil	06-29-95	0–0.5	0.279	±0.0536	0.406	±0.183
03859	08-GR-002-0-SS	Soil	06-29-95	0–0.5	0.0916	±0.0324	0.384	±0.239
03859	08-GR-003-0-SS	Soil	06-29-95	0–0.5	0.399	±0.0704	0.490	±0.178
03859	08-GR-004-0-SS	Soil	06-29-95	0–0.5	0.660	±0.104	0.513	±0.230
03859	08-GR-005-0-SS	Soil	06-29-95	0–0.5	1.04	±0.156	0.639	±0.270
03859	08-GR-006-0-SS	Soil	06-29-95	0–0.5	0.452	±0.0807	0.759	±0.248
03859	08-GR-007-0-SS	Soil	06-29-95	0–0.5	0.285	±0.0571	0.661	±0.217
03859	08-GR-008-0-SS	Soil	06-29-95	0–0.5	0.488	±0.0835	0.472	±0.197
03859	08-GR-009-0-SS	Soil	06-29-95	0–0.5	0.346	±0.0664	0.901	±0.292
03859	08-GR-010-0-SS	Soil	06-29-95	0–0.5	0.317	±0.0583	0.471	±0.159
03859	08-GR-011-0-SS	Soil	06-29-95	0–0.5	0.446	±0.114	0.842	±0.266
03859	08-GR-012-0-SS	Soil	06-29-95	0–0.5	0.803	±0.128	0.507	±0.227
03859	08-GR-013-0-SS	Soil	06-29-95	0–0.5	0.684	±0.114	0.813	±0.279
03859	08-GR-014-0-SS	Soil	06-29-95	0–0.5	0.0429	±0.0285	0.603	±0.208
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	1.55	NA	1.03	NA

Refer to footnotes at end of table.

Table 4.4.1.2.2-2 (Continued)
Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
June 1995
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
03859	08-GR-001-0-SS	Soil	06-29-95	0–0.5	**ND (0.306)**	--	**ND (4.14)**	--
03859	08-GR-002-0-SS	Soil	06-29-95	0–0.5	**ND (0.317)**	--	**ND (4.39)**	--
03859	08-GR-003-0-SS	Soil	06-29-95	0–0.5	**ND (0.342)**	--	**ND (4.62)**	--
03859	08-GR-004-0-SS	Soil	06-29-95	0–0.5	**ND (0.352**	--	**ND (4.62)**	--
03859	08-GR-005-0-SS	Soil	06-29-95	0–0.5	**ND (0.451)**	--	**ND (6.05)**	--
03859	08-GR-006-0-SS	Soil	06-29-95	0–0.5	**ND (0.426)**	--	**ND (5.75)**	--
03859	08-GR-007-0-SS	Soil	06-29-95	0–0.5	**ND (0.372)**	--	**ND (4.97)**	--
03859	08-GR-008-0-SS	Soil	06-29-95	0–0.5	**ND (0.352)**	--	**ND (5.16)**	--
03859	08-GR-009-0-SS	Soil	06-29-95	0–0.5	**ND (0.386)**	--	**ND (5.34)**	--
03859	08-GR-010-0-SS	Soil	06-29-95	0–0.5	**ND (0.336)**	--	**ND (4.47)**	--
03859	08-GR-011-0-SS	Soil	06-29-95	0–0.5	**ND (0.426)**	--	**ND (6.10)**	--
03859	08-GR-012-0-SS	Soil	06-29-95	0–0.5	**ND (0.456)**	--	**ND (6.01)**	--
03859	08-GR-013-0-SS	Soil	06-29-95	0–0.5	**ND (0.457)**	--	**ND (6.00)**	--
03859	08-GR-014-0-SS	Soil	06-29-95	0–0.5	**ND (0.345)**	--	**ND (4.87)**	--
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	0.16	NA	2.31	NA

Refer to footnotes at end of table.

Table 4.4.1.2.2-2 (Concluded)
Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
June 1995
(On-Site Laboratory)

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the MDA.
[d]Dinwiddie September 1997.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.1.2.2-3
Summary of HE Compounds Analytical MDLs for
SWMU 8, Feature 8DDD (Explosive Contaminated Area) RFI Soil Sampling
October 1995 and February 1998
(On- and Off-Site Laboratories)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
2-amino-4,6-Dinitrotoluene	6.6
4-amino-2,6-Dinitrotoluene	5.45
2,4-Dinitrotoluene	6.18
2,6-Dinitrotoluene	6.48
1,3-Dinitrobenzene	4.05
HMX	5.27 (100)
Nitrobenzene	5.21
m-Nitrotoluene	11.1
o-Nitrotoluene	7.83
p-Nitrotoluene	10.6
RDX	9.71 (150)
Tetryl	7.55
sym-Trinitrobenzene	6.62
2,4,6-Trinitrotoluene	5.67 (76)

Note: Numbers in parentheses are 1995 on-site laboratory sampling event screening-level detection limits.
[a]EPA November 1986.
EPA = U. S. Environmental Protection Agency.
HE = High Explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.1.2.3-1
Summary of SWMU 8, Feature 8DDD (Explosive Contaminated Area) Field Duplicate Relative Percent Difference Values
June 1995 and February 1998
(Off-Site Laboratories)

Sample Attributes			Metals Relative Percent Difference										
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Mercury	Nickel	Lead	Selenium	Silver	Zinc
510266	08-GR-050-0-SS 08-GR-060-0-SSD	0–0.5	22.22	0.00	24.00	9.27	30.77	15.98	14.85	4.61	2.63	18.84	20.71

[a]Analysis request/chain-of-custody record.
08 = SWMU 8.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not applicable.
SS = Surface soil sample.
SSD = Surface soil sample duplicate.
SWMU = Solid Waste Management Unit.

concentrations in the samples collected from the site were less than the background concentrations for those metals. Although the RPDs presented in Table 4.4.1.2.3-1 exceed the RPD limit, the values are typical of the heterogeneous uncontaminated soil and are therefore acceptable.

Data Validation Results for SWMU 8DDD (Explosives Contaminated Area)

The off-site laboratory results from LAS and GEL were reviewed according to "Data Verification/ Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project Administrative Operating Procedure (AOP) 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For Analysis Request/Chain-of-Custody (AR/COC) 510266, QC measures were adequate. No analytical data from this sampling event required qualification. For AR/COC 509102, no data were qualified.

4.4.1.3 SWMUs 8PP and 8RR (Area of Open Burning)

KAFB Installation Restoration Program records indicated evidence of open burning at SNL/NM ER SWMUs 8PP and 8RR (Figure 2.1-6). Post-test electronic debris and pieces of metal slag found at the site provide evidence of the burning. Initially, RFI sampling was conducted at the six debris areas within this site in November 1996 (Figure 4.4.1.3-1). Subsequent VCMs and sampling activities were conducted in July 1997 (VCM/sampling), August 1998 (VCM/sampling), June and July 1999 (sampling), March 2000 (sampling), and January and February 2004 (VCA/sampling). The VCA/sampling conducted in January and February 2004 is discussed in Section 4.5.2.

4.4.1.3.1 Sampling Activities at SWMUs 8PP and 8RR (Area of Open Burning)

The OU 1332 RFI Work Plan (SNL/NM June 1995) provides details of the initial RFI surface soil sampling conducted in November 1996. Samples of metal slag were collected from each of the six debris areas within SWMUs 8PP and 8RR. Slag samples were collected from the ground surface, and a soil sample was collected from directly beneath each piece of slag at the 0- to 6-inch depth interval.

4.4.1.3.2 Sampling Results for SWMUs 8PP and 8RR (Area of Open Burning)

Samples were analyzed for metals, HE compounds, and radionuclides by gamma spectroscopy. All chemical analyses were performed by ERCL and LAS. Samples were analyzed for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

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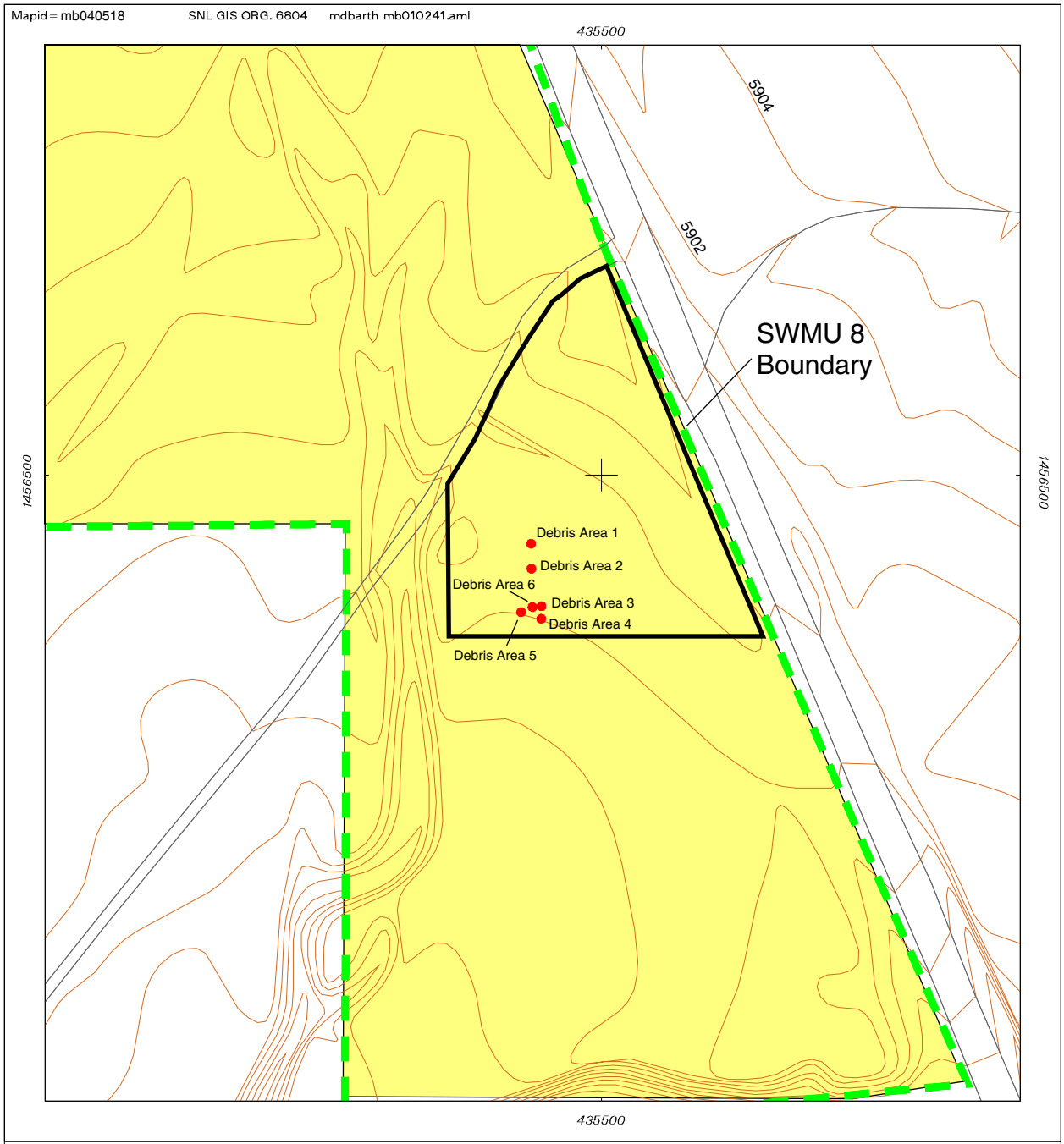

Legend

- Approximate boundary of Area of Open Burning identifying Features 8PP and 8RR
- 2-Foot Contour
- Debris Area
- Road
- SWMU 8 Boundary

Figure 4.4.1.3-1
Solid Waste Management Unit 8
Area of Open Burning

0 50 100
Scale in Feet

0 12 24
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A28

The RFI surface soil analyses revealed levels of the following COCs in excess of Work Plan (SNL/NM June 1995) risk-based action levels:

- Cadmium
- Chromium
- Copper
- Lead
- Nickel
- Silver
- Zinc

However, because the soil sampled during this RFI was removed and disposed of off site during the VCA conducted in January and February 2004, the sampling results are not pertinent to the risk assessment analysis for SWMUs 8 and 58. The RFI sampling locations and results are presented in Annex B, Figure B-1 and Tables B-1 through B-3, respectively. The elevated metal concentrations prompted the VCM/VCA activities discussed in Section 4.5.2. The VCM/VCA and confirmatory sampling are discussed in Section 4.5.2.

4.4.1.3.3 Data Quality Results for SWMUs 8PP and 8RR (Area of Open Burning)

QA/QC field samples collected as part of the November 1996 RFI soil sampling event included two replicate off-site samples. However, because the soil sampled during this event was removed during the VCA conducted in January and February 2004, the data quality results are only provided in Annex B.

Data Validation Results for SWMUs 8PP and 8RR (Area of Open Burning)

Because the soil sampled during the RFI in November 1996 was removed during the VCA conducted in January and February 2004, the data validation results are not discussed.

4.4.1.4 SWMU 8GGG (Arroyo Area)

Soil sampling was conducted to determine whether COCs from the Features 8Y/58B Debris Pile and Pit had migrated into the Arroyo Area (SWMU 8GGG, Figure 2.1-6).

4.4.1.4.1 Sampling Activities at SWMU 8GGG (Arroyo Area)

The OU 1332 RFI Work Plan (SNL/NM June 1995) identified four arroyo samples in the Arroyo Area (SWMU 8GGG) to be obtained from locations topographically downgradient from SWMU 8Y/58B, Debris Pile and Pit. The samples were collected in November 1996. In 1998, six additional samples were collected to characterize shallow drainage channels downgradient from SWMU 8Y. All samples were judgmentally selected to represent the downgradient drainage of the main debris area in SWMU 8. Sample locations are shown in Figure 4.4.1.4.1-1.

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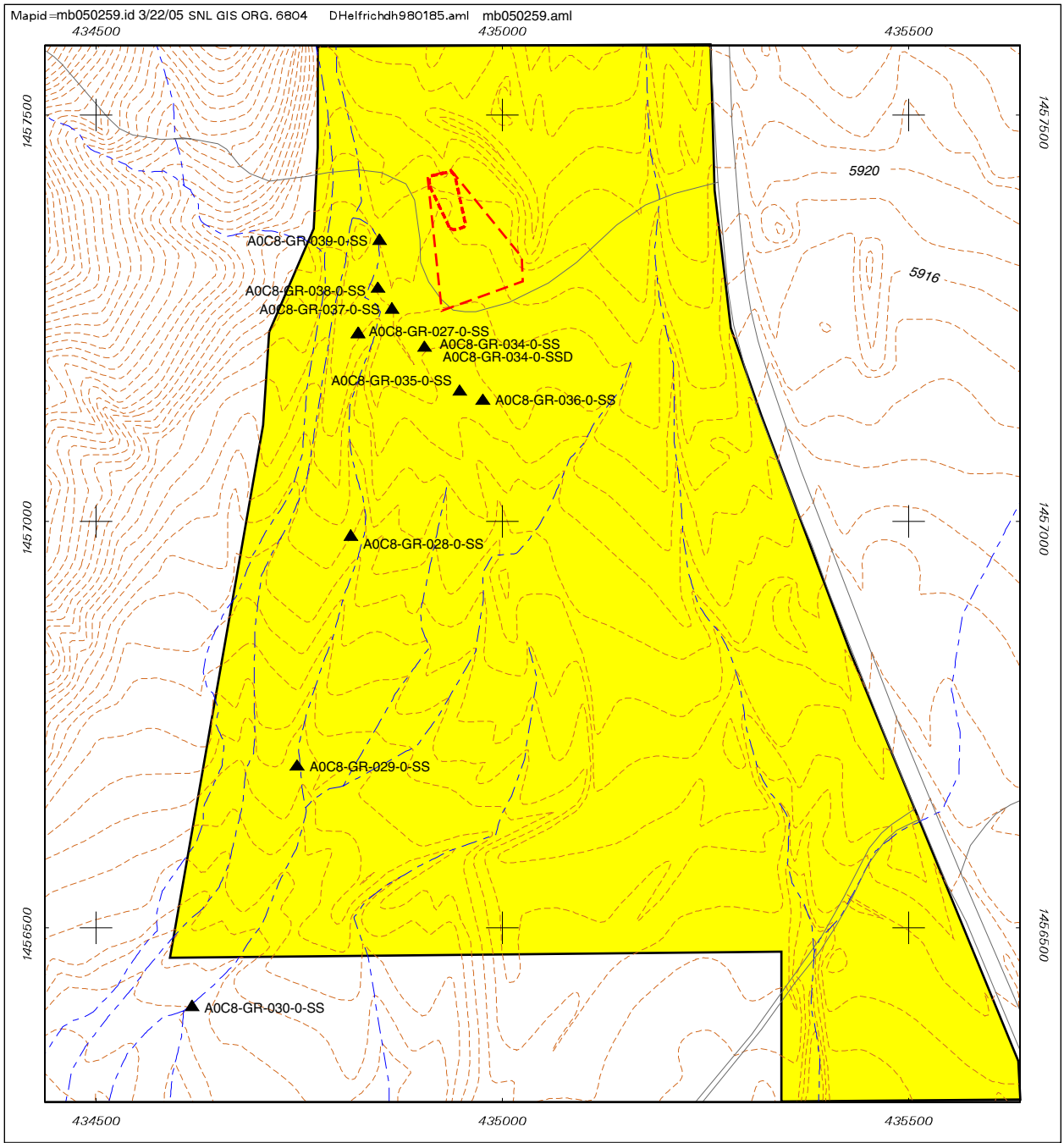

Legend

- Arroyo sediment sample location
- Road
- 2-Foot Contour
- Surface Drainage
- SWMU 8 Boundary
- Feature 8Y/58B

Figure 4.4.1.4.1-1
Soil/sediment sample locations along the Arroyo Area (Feature 8GGG)

0 100 200
Scale in Feet

0 24 48
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A66

The samples were analyzed for metals and HE compounds off site at GEL and on site at ERCL. The 1998 samples were analyzed for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

4.4.1.4.2 Sampling Results for SWMU 8GGG (Arroyo Area)

To summarize, eleven metals were detected above the background levels, two HE compounds were detected, and no radionuclides were detected above the background levels. However, the MDAs for several uranium-235 analyses were above background levels. These analytical results are incorporated into the Risk Assessment for SWMUs 8 and 58 (Annex A).

Table 4.4.1.4.2-1 summarizes the metal analytical results for the soil samples collected from the Arroyo Areas. The following detections were reported:

- One sample plus the duplicate contained silver at concentrations of 0.598 and 1.43 mg/kg, respectively, which are above the background level of less than 0.5 mg/kg.
- Two samples contained elevated barium levels at 350 and 390 mg/kg, above the background limit of 246 mg/kg.
- Two samples contained beryllium levels up to 1.5 mg/kg, compared to a background limit of 0.75 mg/kg.
- Nine samples contained copper levels ranging from 17.3J to 100 mg/kg, compared to a background limit of 17.1 mg/kg.
- One sample contained cadmium at a concentration of 0.763 mg/kg, which is above the background limit of 0.64 mg/kg.
- Two samples contained elevated chromium levels at 55 and 84 mg/kg, above the background limit of 18.8 mg/kg.
- Four samples contained elevated mercury levels at 0.11J and 0.29J mg/kg, above the background limit of 0.055 mg/kg.
- Three samples contained lead at levels ranging from 23.8 to 52 mg/kg, compared to a background limit of 18.9 mg/kg.
- Two samples contained elevated nickel levels at 53 and 66 mg/kg, compared to a background limit of 16.6 mg/kg.
- Two samples contained elevated selenium levels at 3.4 and 3.6 mg/kg, above the background limit of 2.7 mg/kg.
- Three samples contained zinc at levels ranging from 130J to 190 mg/kg, compared to a background limit of 52.1 mg/kg.

Table 4.4.1.4.2-2 summarizes the analytical results for the HE compound analysis. The analysis for HE compounds detected 2,4,6-trinitrotoluene in one sample at 1,900 micrograms (μg)/kg. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) was detected in a different sample at 150 μg/kg. Table 4.4.1.4.2-3 provides the MDLs for all HE parameters analyzed.

Table 4.4.1.4.2-1
Summary of SWMU 8 Feature 8GGG (Arroyo Area) RFI Soil Sampling, Metals Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010/7000 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
5998	AOC8-GR-028-0-SS	Soil	11-19-96	0–0.5	5	**350**	**1.5**	ND (0.54)	**84**	**100**
5998	AOC8-GR-027-0-SS	Soil	11-19-96	0–0.5	0.42 J (1.4)	24	ND (0.2)	ND (0.54)	4.4	10 J (16)
5998	AOC8-GR-029-0-SS	Soil	11-19-96	0–0.5	5.2	**390**	**1.3**	ND (0.54)	**55**	**100**
5998	AOC8-GR-030-0-SS	Soil	11-19-96	0–0.5	0.69 J (1.4)	36	ND (0.2)	ND (0.54)	6.7	17
6011	AOC8-GR-030-0-SR	Soil	11-19-96	0–0.5	1.74	68.1	0.251 J (0.459)	0.171 J (0.459)	8.53	**19.8**
510271	AOC8-GR-034-0-SS	Soil	01-06-98	0–0.5	1.62	192	0.273 J (0.500)	**0.763**	17.7	**61.6**
510271	AOC8-GR-034-0-SSD	Soil	01-06-98	0–0.5	1.54	42.6	0.228 J (0.459)	0.240 (0.459)	7.29	**33.2**
510271	AOC8-GR-035-0-SS	Soil	01-06-98	0–0.5	2.05	123	0.357 J (0.490)	0.381 (0.490)	15.2	**25.6**
510271	AOC8-GR-036-0-SS	Soil	01-06-98	0–0.5	1.69	70.7	0.282 J (0.490)	0.194 (0.490)	11.1	**26.1**
510271	AOC8-GR-037-0-SS	Soil	01-06-98	0–0.5	1.21	57.5	0.245 J (0.467)	0.145 (0.467)	7.92	**19.7**
510271	AOC8-GR-038-0-SS	Soil	01-06-98	0–0.5	1.90	66.2	0.298 J (0.476)	0.117 (0.476)	9.39	**17.3**
510271	AOC8-GR-039-0-SS	Soil	01-06-98	0–0.5	1.33	50.3	0.234 J (0.495)	0.104 (0.495)	6.71	16.3
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
5998	AOC8-GR-030-FB	Water	11-19-96	NA	ND (0.38)	ND (3.2)	ND (0.2)	ND (0.54)	ND (0.37)	17
6011	AOC8-GR-030-FB	Water	11-19-96	NA	ND (0.00276)	0.000374 J (0.0100)	ND (0.000135)	ND (0.000209)	ND (0.000621)	0.00159 J (0.0100)
6011	AOC8-GR-030-EB	Water	11-19-96	NA	ND (0.00276)	0.000315 J (0.0100)	ND (0.000135)	ND (0.000209)	ND (0.000621)	0.00571 J (0.0100)
5998	AOC8-GR-030-EB	Water	11-19-96	NA	ND (0.38)	ND (3.2)	ND (0.2)	ND (0.54)	ND (0.37)	ND (4.1)

Refer to footnotes at end of table.

Table 4.4.1.4.2-1 (Continued)
Summary of SWMU 8 Feature 8GGG (Arroyo Area) RFI Soil Sampling, Metals Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010/7000 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
5998	AOC8-GR-028-0-SS	Soil	11-19-96	0–0.5	**52**	**0.29 J (0.3)**	**66**	**3.6**	ND (0.095)	**190**
5998	AOC8-GR-027-0-SS	Soil	11-19-96	0–0.5	3.5	**ND (0.078)**	4.3 J (7.3)	ND (0.47)	ND (0.095)	13 J (32)
5998	AOC8-GR-029-0-SS	Soil	11-19-96	0–0.5	**46**	**0.11 J (0.3)**	**53**	**3.4**	ND (0.095)	**150**
5998	AOC8-GR-030-0-SS	Soil	11-19-96	0–0.5	9.2	**ND (0.078)**	6.7 J (7.3)	ND (0.47)	ND (0.095)	22 J (32)
6011	AOC8-GR-030-0-SR	Soil	11-19-96	0–0.5	16.1	ND (0.02)	8.09	ND (0.114)	ND (0.0212 J)	39.1
510271	AOC8-GR-034-0-SS	Soil	01-06-98	0–0.5	**23.8**	0.0275 J (0.0313)	15.3	0.194 J (0.500)	**0.598**	38.3
510271	AOC8-GR-034-0-SSD	Soil	01-06-98	0–0.5	10.9	0.0196 J (0.0327)	6.63	ND (0.07)	**1.43**	**130**
510271	AOC8-GR-035-0-SS	Soil	01-06-98	0–0.5	12.1	0.0205 J (0.0282)	15.8	0.175 J (0.490)	0.292 (0.490)	39.3
510271	AOC8-GR-036-0-SS	Soil	01-06-98	0–0.5	10.4	0.0194 J (0.0323)	10.5	ND (0.07)	0.195 (0.490)	38.9
510271	AOC8-GR-037-0-SS	Soil	01-06-98	0–0.5	7.28	0.0207 J (0.0313)	7.4	ND (0.07)	0.125 (0.467)	33.4
510271	AOC8-GR-038-0-SS	Soil	01-06-98	0–0.5	9.23	ND (0.0173)	8.28	ND (0.07)	0.148 (0.476)	37.7
510271	AOC8-GR-039-0-SS	Soil	01-06-98	0–0.5	4.67	ND (0.0173)	7.41	ND (0.07)	0.152 (0.495)	39.7
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)										
5998	AOC8-GR-030-FB	Water	11-19-96	NA	ND (0.83)	ND (0.078)	ND (1.9)	ND (0.47)	ND (0.095)	ND (8.4)
6011	AOC8-GR-030-FB	Water	11-19-96	NA	ND (0.00136)	ND (0.0001)	ND (0.000996)	ND (0.00228)	ND (0.00424)	ND (0.00117)
6011	AOC8-GR-030-EB	Water	11-19-96	NA	0.00168 J (0.00500)	ND (0.0001)	ND (0.000996)	ND (0.00228)	ND (0.00424)	ND (0.00117)
5998	AOC8-GR-030-EB	Water	11-19-96	NA	ND (0.83)	ND (0.078)	ND (1.9)	ND (0.47)	ND (0.095)	ND (8.4)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

Table 4.4.1.4.2-1 (Concluded)
Summary of SWMU 8 Feature 8GGG (Arroyo Area) RFI Soil Sampling, Metals Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

AOC8 = SWMU 8 Arroyo Area.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SR = Soil sample replicate (duplicate) analyzed at an off-site laboratory.
SS = Surface soil sample.
SSD = Surface soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.1.4.2-2
Summary of Analytical Detections of HE Compounds for
SWMU 8, Feature 8GGG (Arroyo Area) Soil Samples
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					HE Residues (EPA Method 8330[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	HMX	2,4,6-Trinitrotoluene
05998	AOC8-GR-027-0-SS	Soil	11-19-96	0–0.5	ND (150)	ND (120)
05998	AOC8-GR-028-0-SS	Soil	11-19-96	0–0.5	ND (150)	ND (120)
05998	AOC8-GR-029-0-SS	Soil	11-19-96	0–0.5	ND (150)	ND (120)
05998	AOC8-GR-030-0-SS	Soil	11-19-96	0–0.5	ND (150)	ND (120)
06011	AOC8-GR-030-0-SR	Soil	11-19-96	0–0.5	ND (5.27 J)	ND (5.67)
510271	AOC8-GR-034-0-SS	Soil	01-06-98	0–0.5	ND (5.27)	ND (5.67)
510271	AOC8-GR-034-0-SSD	Soil	01-06-98	0–0.5	ND (5.27)	ND (5.67)
510271	AOC8-GR-035-0-SS	Soil	01-06-98	0–0.5	ND (5.27)	ND (5.67)
510271	AOC8-GR-036-0-SS	Soil	01-06-98	0–0.5	ND (5.27)	ND (5.67)
510271	AOC8-GR-037-0-SS	Soil	01-06-98	0–0.5	ND (5.27)	**1,900**
510271	AOC8-GR-038-0-SS	Soil	01-06-98	0–0.5	**150**	ND (5.67)
510271	AOC8-GR-039-0-SS	Soil	01-06-98	0–0.5	ND (5.27)	ND (5.67)
Quality Assurance/Quality Control Samples (μg/L)						
05998	AOC8-GR-030-FB	Water	11-19-96	NA	ND (18)	ND (14)
06011	AOC8-GR-030-FB	Water	11-19-96	NA	ND (0.0459)	ND (0.0293 J)
06011	AOC8-GR-030-EB	Water	11-19-96	NA	ND (0.0459)	ND (0.0293 J)
05998	AOC8-GR-030-EB	Water	11-19-96	NA	ND (18)	ND (14)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
AOC8 = SWMU 8 Arroyo Area.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND () = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SR = Soil sample replicate.
SS = Surface soil sample.
SSD = Surface soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.1.4.2-3
Summary of HE Compounds Analytical MDLs for
SWMU 8, Feature 8GGG (Arroyo Area) RFI Soil Sampling
November 1996 and January 1998
(On- and Off-Site Laboratories)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
2,4-Dinitrotoluene	6.18 (120)
2,6-Dinitrotoluene	6.48 (120)
2-amino-4,6-Dinitrotoluene	6.6
4-amino-2,6-Dinitrotoluene	5.45
m-Dinitrobenzene	4.05
HMX	5.27 (150)
Nitrobenzene	5.21
m-Nitrotoluene	11.1 (100)
o-Nitrotoluene	7.83 (90)
p-Nitrotoluene	10.6 (100)
RDX	9.71 (110)
Tetryl	7.55
sym-Trinitrobenzene	6.62
2,4,6-Trinitrotoluene	5.67 (120)

Note: Numbers in parentheses are 1996 sampling event on-site laboratory detection limits.
[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High Explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

No elevated radionuclide activity was found during field-screening of the RFI samples collected in 1996; therefore, no gamma spectroscopy analyses were performed. Table 4.4.1.4.2-4 summarizes the results of radionuclide analysis by gamma spectroscopy for the six arroyo sediment samples collected in 1998. No elevated radionuclide activity was detected. Several of the MDAs for uranium-235 were slightly above the background activity levels. The gamma spectroscopy analytical results for both the 1996 and 1998 sampling events are included in Annex C.

4.4.1.4.3 Data Quality Results for SWMU 8GGG (Arroyo Area)

QA/QC field samples collected as part of the RFI soil sampling event included one duplicate, two aqueous FB, and two aqueous EB samples.

The EB samples were analyzed at on- and off-site laboratories for metals and HE compounds. Metal concentrations in one of the EB samples were slightly greater than the MDLs for barium, copper, and lead. The concentrations of barium, copper, and lead were below the PQL, and the results were qualified as J (estimated) during data validation. No HE compounds were detected in the EB samples. No QA/QC samples were collected for radionuclide analyses.

The FB samples were analyzed at on- and off-site laboratories for metals and HE compounds. Reported concentrations were slightly greater than the MDLs for barium and copper. The concentrations of barium and copper were below the PQL, and the results were qualified as J (estimated) during data validation.

RPDs were calculated for the metals detected in the primary and duplicate samples, which were analyzed by GEL. The analyses for the sample pairs for barium, cadmium, chromium, copper, mercury, nickel, lead, silver, and zinc yielded RPDs that exceeded the acceptable RPD limit of less than 25 percent (Table 4.4.1.4.3-1). Although the RPDs presented in Table 4.4.1.4.3-1 exceed the RPD limit, the values are typical of the heterogeneous uncontaminated soil and are therefore acceptable. Barium, chromium, mercury, and nickel concentrations were below approved background concentrations.

Data Validation Results for SWMU 8GGG (Arroyo Area)

The off-site laboratory results from GEL were reviewed according to “Data Verification/ Validation, Level 3–DV-3,” as defined in “Data Validation Procedure for Chemical and Radiochemical Data,” SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to “Laboratory Data Review Guidelines,” Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirmed that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

Table 4.4.1.4.2-4
Summary of SWMU 8, Feature 8GGG (Arroyo Area) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
January 1998
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[d]
510121	AOC8-GR-034-0-SS	Soil	01-06-98	0–0.5	0.0690	0.0316	0.504	0.681
510121	AOC8-GR-035-0-SS	Soil	01-06-98	0–0.5	ND (0.0259)	--	0.696	0.363
510121	AOC8-GR-036-0-SS	Soil	01-06-98	0–0.5	0.103	0.0361	0.562	0.281
510121	AOC8-GR-037-0-SS	Soil	01-06-98	0–0.5	0.123	0.0334	0.560	0.280
510121	AOC8-GR-038-0-SS	Soil	01-06-98	0–0.5	0.0938	0.0283	0.641	0.313
510121	AOC8-GR-039-0-SS	Soil	01-06-98	0–0.5	0.0211	0.0270	0.626	0.310
510121	AOC8-GR-034-0-SSD	Soil	01-06-98	0–0.5	0.0966	0.144	0.500	0.254
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	1.55	NA	1.03	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID[c]	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
510121	AOC8-GR-034-0-SS	Soil	01-06-98	0–0.5	**ND (0.188)**	--	ND (1.38)	--
510121	AOC8-GR-035-0-SS	Soil	01-06-98	0–0.5	**ND (0.189)**	--	ND (1.36)	--
510121	AOC8-GR-036-0-SS	Soil	01-06-98	0–0.5	**ND (0.192)**	--	ND (1.39)	--
510121	AOC8-GR-037-0-SS	Soil	01-06-98	0–0.5	ND (0.110)	--	ND (1.26)	--
510121	AOC8-GR-038-0-SS	Soil	01-06-98	0–0.5	**ND (0.175)**	--	ND (1.29)	--
510121	AOC8-GR-039-0-SS	Soil	01-06-98	0–0.5	**ND (0.183)**	--	ND (1.32)	--
510121	AOC8-GR-034-0-SSD	Soil	01-06-98	0–0.5	**ND (0.186)**	--	ND (1.33)	--
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	0.16	NA	2.31	NA

Refer to footnotes at end of table.

Table 4.4.1.4.2-4 (Concluded)
Summary of SWMU 8, Feature 8GGG (Arroyo Area) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
January 1998
(On-Site Laboratory)

Note: Values in **bold** exceed background activities or have MDAs that exceed background activities.

[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.

[b]Analysis request/chain-of-custody record.

[c]Two standard deviations about the MDA.

[d]Dinwiddie September 1997.

AOC8 = SWMU 8 Arroyo Area.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SSD = Surface soil sample duplicate.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.1.4.3-1
Summary of SWMU 8 Feature 8GGG (Arroyo Area) Field Duplicate Relative Percent Difference Values
January 1998
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference					
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
510271	AOC8-GR-034-0-SS AOC8-GR-034-0-SSD	0–0.5	5.06	127.37	17.96	104.29	83.31	59.92

Sample Attributes			Metals Relative Percent Difference					
Record Number[a]	ER Sample ID	Sample Depth (ft)	Mercury	Nickel	Lead	Selenium	Silver	Zinc
510271	AOC8-GR-034-0-SS AOC8-GR-034-0-SSD	0–0.5	74.35	79.07	74.35	NA	82.05	108.97

[a]Analysis request/chain-of-custody record.
AOC8 = SWMU 8 Arroyo Area.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not applicable.
SS = Surface soil sample.
SSD = Surface soil sample duplicate.
SWMU = Solid Waste Management Unit.

During data validation, qualifications were applied to some of the data results. For AR/COC 5998, no soil data were qualified. For AR/COC 6011, validation qualifications were applied to soil and aqueous sample results. The matrix spike (MS)/matrix spike duplicate (MSD) samples failed to meet percent recovery acceptance criteria for 2,4,6-trinitrotoluene and the results were qualified as nondetect, estimated. No other analytical data required qualification during validation. For AR/COC 510271 no data were qualified.

4.4.1.5 SWMUs 8Y and 58B (Debris Pile and Pit)

The SWMU 58B pit was located within the SWMU 8Y debris area (Figure 2.1-6). Both features are described in detail in the OU 1332 RFI Work Plan (SNL/NM June 1995). SWMU 8Y was the main area of surface debris in SWMU 8. SWMU 58B was a pit filled with wooden debris that was originally used for a burn test. After the burn test, the pit was filled with debris over time and became part of SWMU 8Y.

RFI sampling was conducted in this area after the debris removal and in April 1996, November 1996, November 1997, January 1998, and July 1998. The analytical results of the surface soil sampling revealed COC concentrations in excess of risk-based action levels. The SWMU 8Y/58B VCM discussed in Section 4.5.3 was conducted to remediate the site. The surface soil from the SWMU 8Y/58B area was removed during the subsequent VCM; therefore, the RFI surface soil sampling results for this area are only briefly discussed in this section. The post-VCM confirmatory sampling of the surface soil remaining on site is discussed in detail in Section 4.5.3. Geoprobe™ subsurface sampling was performed at two locations within the SWMU 58B pit at depths below the soil remediated during the VCMs.

4.4.1.5.1 Sampling Activities at SWMUs 8Y and 58B (Debris Pile and Pit)

Pre-VCM Surface Soil Sampling

The OU 1332 RFI Work Plan (SNL/NM June 1995) describes the plans for the pre-VCM surface soil sampling in detail. In addition to the 36 sample locations originally planned, 10 samples were collected to better define the nature and extent of COCs present above action levels prior to the final VCM. The surface soil sampling locations are shown in Figure 4.4.1.5.1-1.

SWMU 58B Subsurface Sampling

Subsurface samples were collected from two locations in the SWMU 58B pit. The locations are shown in Figure 4.4.1.5.1-1. The first borehole was completed in April 1996. The bit encountered refusal in this borehole at 7.0 feet bgs. Samples were collected at 0.0 to 1.0 foot and 5.0 to 6.0 feet bgs. Because the first borehole encountered refusal, a second borehole was completed in January 1999. Samples from the second borehole were collected at 5.0 to 6.0, 10.0 to 11.0, 15.0 to 16.0, and 20.0 to 21.0 feet bgs.

The samples were analyzed for metals, VOCs, SVOCs, HE, and total petroleum hydrocarbons (TPH). In addition, the 1999 borehole samples were analyzed for tritium. GEL performed all 1996 and 1999 chemical analyses. The samples were also analyzed for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory and for tritium at GEL.

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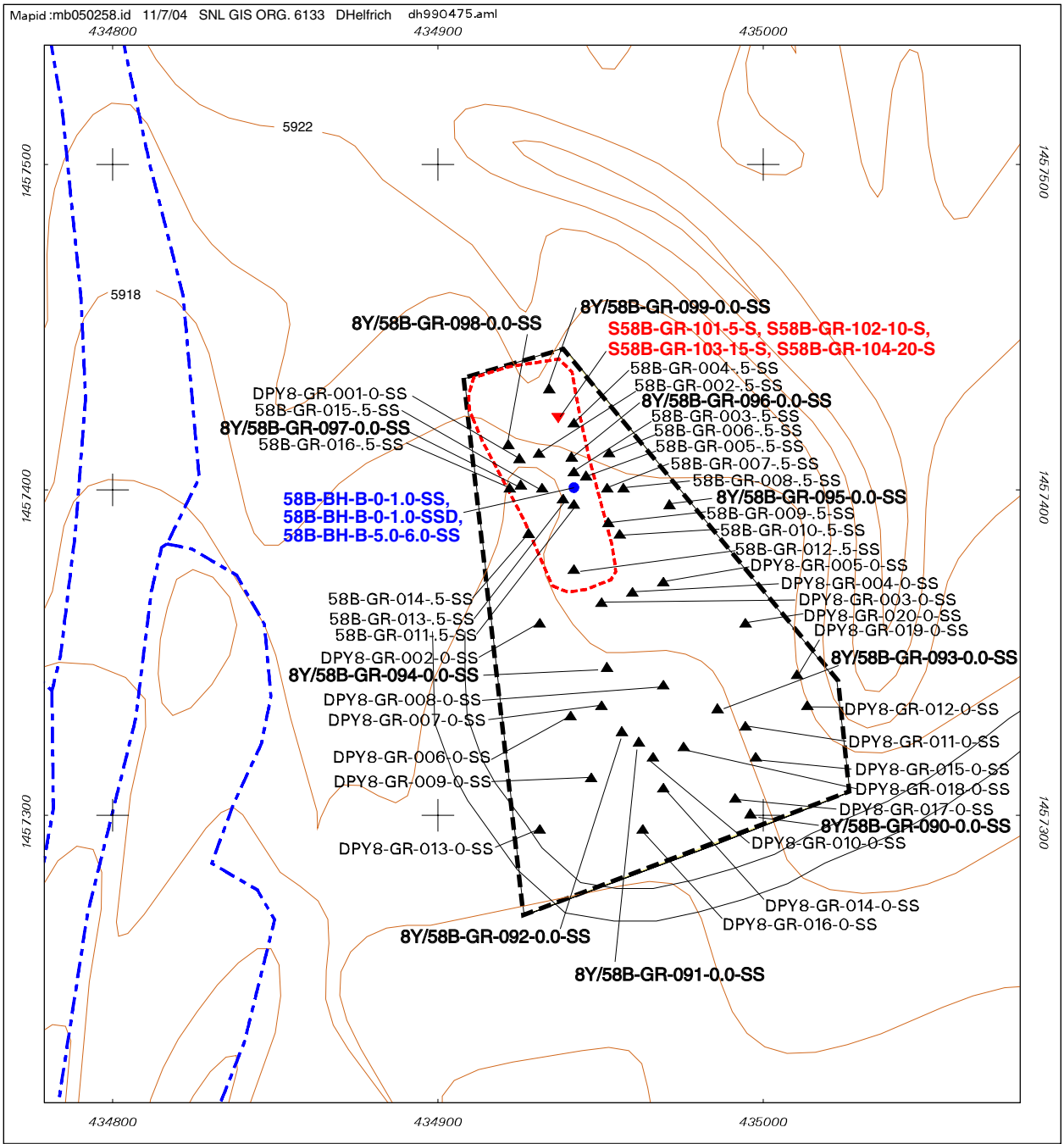


Legend

- RFI/VCM surface soil sample
- April 1996 SWMU 58B RFI borehole
- Jan. 1999 SWMU 58B RFI borehole
- Road
- 2-foot Contour
- Surface drainage
- Feature 58B Boundary
- Feature 8Y

Figure 4.4.1.5.1-1
Surface and subsurface sample locations at Features 8Y and 58B

0 25 50
Scale in Feet

0 6 12
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A65

4.4.1.5.2 Sampling Results for SWMUs 8Y and 58B (Debris Pile and Pit)

Pre-VCM Surface Samples

The RFI surface soil sample analysis revealed levels of the following COCs in excess of the OU 1332 RFI Work Plan (SNL/NM June 1995) risk-based action levels:

- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Lead
- Mercury
- Zinc
- 2,4,6-Trinitrotoluene
- HMX

As a result of the elevated COCs, a VCM was conducted in September 1998, which is discussed in Section 4.5.3. The surface soil sampling locations are shown in Figure 4.4.1.5.1-1. The analytical results are included in Annex B (Tables B-4 through B-11), but are not relevant to this proposal because the soil sampled was removed as part of the VCM.

Subsurface Samples

The ER Sample Identifications (IDs) are slightly different for the 1996 and 1999 borehole sampling events. For the 1996 sampling event, the sample IDs follow the pattern 58B-BH-B-X-X.X-SS, where 58B designates SWMU 58, Feature B; BH-B indicates borehole; X-X.X designates the sample depth; and SS indicates a soil sample. For the 1999 sampling event, the Sample IDs followed the pattern, S58B-GR-XXX-V-S, where S58B designates SWMU 58, Feature B; GR designates a grab sample; XXX designates the sample number; V indicates the sample depth; and S indicates a soil sample.

Table 4.4.1.5.2-1 summarizes the results of metal analyses for the soil samples from each borehole. Two samples (58B-BH-B-0-1.0-SS and 58B-BH-B-0-1.0-SSD) from the 1996 sampling event were actually surface samples from soil that was removed during the subsequent VCM. The 1996 borehole sample from the 5.0- to 6.0-foot depth (58B-BH-B-5.0-6.0-SS) contained the following metals at concentrations above background:

- Silver at 1.49J mg/kg, compared to a background limit of less than 0.5 mg/kg
- Lead at 26.7J mg/kg, compared to a background limit of 18.9 mg/kg
- Copper at 258J mg/kg, compared to a background limit of 17.1 mg/kg
- Nickel at 815 mg/kg, compared to a background limit of 16.6 mg/kg

The results for the 1999 borehole samples were at background levels with two exceptions. The sample from 15 feet bgs (S58B-GR-103-15-S) contained chromium at 21.0 mg/kg, which is above the background limit of 18.8 mg/kg. The sample from 20 feet bgs (S58B-GR-104-20-S) contained lead at a concentration of 31.0 mg/kg, compared to a background limit of 18.9 mg/kg.

Table 4.4.1.5.2-1
Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, Metals Analytical Results
April 1996 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
58B Borehole No. 1—April 1996										
05072	58B-BH-B-0-1.0-SS	soil	04-22-96	0–1.0	3.17 J	136	0.450 J (0.481)	0.548 J	15.1 J	**222 J**
05072	58B-BH-B-0-1.0-SSD	soil	04-22-96	0–1.0	1.83 J	135	0.331 J (0.49)	**1.18 J**	8.38 J	**86.8 J**
05072	58B-BH-B-5.0-6.0-SS	soil	04-22-96	5.0–6.0	2.39 J	89.7	0.321 J (0.5)	0.355 J (0.5)	10.5 J	**258 J**
58B Borehole No. 2—January 1999										
601351	S58B-GR-101-5-S	Soil	01-26-99	5.0–6.0	1.19 J	67.7 J	0.250 J (0.476)	0.111 J (0.476)	17.0 J	*
601351	S58B-GR-102-10-S	Soil	01-26-99	10.0–11.0	1.37 J	44.6 J	0.220 J (0.485)	0.0118 J (0.485)	10.9 J	*
601353	S58B-GR-103-15-S	Soil	01-27-99	15.0–16.0	1.27	40.3	0.170 J (0.490)	0.123 J (0.490)	**21.0**	*
601353	S58B-GR-104-20-S	Soil	01-27-99	20.0–21.0	1.35	44.5	0.246 J (0.500)	0.185 J (0.500)	14.7	*
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance Samples (mg/L)										
05072	58B-BH-B-FB	Water	04-22-96	NA	ND (0.00186)	0.000124 J (0.01)	ND (0.0000114)	ND (0.0000970)	ND (0.000596)	ND (0.000539)
05072	58B-BH-B-EB	Water	04-22-96	NA	ND (0.00186)	0.00327 J (0.01)	ND (0.0000114)	ND (0.0000970)	0.000900 J (0.01)	0.00633 J (0.01)

Refer to footnotes at end of table.

Table 4.4.1.5.2-1 (Continued)
Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, Metals Analytical Results
April 1996 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
58 Feature B Borehole No. 1—April 1996										
05072	58B-BH-B-0-1.0-SS	Soil	04-22-96	0–1.0	**58.5 J**	0.0235 J (0.0282)	10.2	1.08	**6.71 J**	**67.2 J**
05072	58B-BH-B-0-1.0-SSD	Soil	04-22-96	0–1.0	**31.9 J**	0.0201 J (0.0294)	8.41	0.597	**3.93 J**	45.8 J
05072	58B-BH-B-5.0-6.0-SS	Soil	04-22-96	5.0–6.0	**26.7 J**	0.0164 J (0.031)	**815**	0.886	**1.49 J**	50.7 J
58 Feature B Borehole No. 2—January 1999										
601351	S58B-GR-101-5-S	Soil	01-26-99	5.0–6.0	4.17 J	0.0136 J (0.0293)	5.98 J	ND (0.135 J)	ND (0.031 J)	*
601351	S58B-GR-102-10-S	Soil	01-26-99	10.0–11.0	5.09 J	ND (0.00225 J)	7.29 J	ND (0.135 J)	ND (0.031 J)	*
601353	S58B-GR-103-15-S	Soil	01-27-99	15.0–16.0	4.63	0.0101 J (0.0332)	6.85	ND (0.135)	ND (0.031)	*
601353	S58B-GR-104-20-S	Soil	01-27-99	20.0–21.0	**31.0**	0.0133 J (0.0271)	9.54	ND (0.135)	0.120 J (0.500)	*
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance Samples (mg/L)										
05072	58B-BH-B-FB	Water	04-22-96	NA	ND (0.00113)	ND (0.0148)	ND (0.000807)	ND (0.00143)	ND (0.00249)	ND (0.00270)
05072	58B-BH-B-EB	Water	04-22-96	NA	ND (0.00113)	ND (0.0148)	0.0124	ND (0.00143)	ND (0.00249)	0.00305 J (0.02)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
* = Not analyzed.
58B = SWMU 58, Feature B.
BH = Borehole.
EB = Equipment blank.
ER = Environmental Restoration.
EPA = U.S. Environmental Protection Agency.
FB = Field blank.

Table 4.4.1.5.2-1 (Concluded)
Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, Metals Analytical Results
April 1996 and January 1999
(Off-Site Laboratory)

ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Subsurface soil sample.
SS = Surface soil sample.
SSD = Surface soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.1.5.2-2 summarizes the results of radionuclide analysis by gamma spectroscopy for the 1999 borehole samples. No elevated radionuclides were detected, but the MDA for uranium-235 in one sample was slightly above the background activity level. The complete analytical package for gamma spectroscopy results is included in Annex C.

Table 4.4.1.5.2-3 summarizes the results for tritium analysis for the 1999 borehole samples. The 5- and 10-foot-bgs samples (S58B-GR-101-5-S and S58B-GR-102-10-S) contained activity levels for tritium at 826 and 806 picocuries per liter (pCi/L), respectively, which are above the background limit of 420 pCi/L. The 15- and 20-foot-bgs sample results were below background levels.

Table 4.4.1.5.2-4 summarizes the results of VOC analyses from each borehole. No VOCs were detected in the 1996 soil samples. Toluene, 2-butanone, and methylene chloride were detected in the 1999 soil samples (S58B-GR-101-5-SS, S58B-GR-102-10-SS, S58B-GR-103-15-SS, and S58B-GR-104-20-SS). Methylene chloride was found at the 5- and 10-foot depths (S58B-GR-101-5-SS and S58B-GR-102-10-SS) at concentrations of 9.8 and 8.0 μg/kg, respectively. The compound was also found in the EB and FB samples. The 5- and 15-foot-bgs samples (S58B-GR-101-5-SS and S58B-GR-103-15-SS) contained 2-butanone at concentrations of 50J and 5.1 μg/kg, respectively. The 5-, 10-, and 20-foot-bgs samples (S58B-GR-101-5-SS, S58B-GR-102-10-SS, and S58B-GR-104-20-SS) contained toluene at 7.4J, 17J, and 3.1 μg/kg, respectively. Table 4.4.1.5.2-5 provides the analytical MDLs.

Table 4.4.1.5.2-6 summarizes the results of the SVOC analyses. No SVOCs were detected in the 1999 soil samples. During the 1996 borehole sampling analysis, diethyl phthalate was detected in a surface soil sample (58B-BH-B-0-1.0-SS) at 269J μg/kg and bis(2-ethylhexyl) phthalate was detected in the 5.0- to 6.0-foot-bgs sample (58B-BH-B-5.0-6.0-SS) at 408J μg/kg. The analytical MDLs are presented in Table 4.4.1.5.2-7.

The results of the TPH analyses are presented in Table 4.4.1.5.2-8. No TPH was detected in the 1999 soil samples. TPH was found in two samples from the 1996 sampling event (58B-BH-B-0-1.0-SSD and 58B-BH-B-5.0-6.0-SS) at concentrations of 1.56J and 1.23J mg/kg, respectively. Analytical MDLs ranged from 0.331 to 1.67 mg/kg.

HE compounds were not detected in any sample from the 1996 or 1999 borehole samples at the MDLs presented in Table 4.4.1.5.2-9.

4.4.1.5.3 Data Quality Results for SWMUs 8Y and 58B (Debris Pile and Pit)

QA/QC field samples collected as part of the subsurface soil sampling event included one duplicate, two FB and two EB samples as well as three trip blanks (TBs) for VOC analyses. The EB samples were analyzed off site for metals, VOCs, SVOCs, TPH, and HE compounds. Metal concentrations were slightly greater than the MDLs for barium, chromium, copper, nickel, and zinc and the results were qualified as J (estimated). No SVOCs, TPH, or HE compounds were detected in the EB samples. Methylene chloride was detected at a J (estimated) value. No QA/QC samples were collected for radionuclide analyses.

The FB samples were analyzed off site for metals, VOCs, SVOCs, TPH, and HE compounds. The concentration for barium was slightly greater than the MDL, and the barium result was qualified as J (estimated). No SVOCs, TPH, or HE compounds were detected in the FB samples. Methylene chloride was detected at a J (estimated) value. No QA/QC samples were collected for radionuclide analyses.

Table 4.4.1.5.2-2
Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, Gamma Spectroscopy Analytical Results
January 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
601348	S58B-GR-101-5-S	Soil	01-26-99	5.0–5.5	ND (0.0187)	--	0.341	0.216
601348	S58B-GR-102-10-S	Soil	01-26-99	10.0–10.5	ND (0.0264)	--	0.413	0.254
601577	S58B-GR-103-15-S	Soil	01-27-99	15.0–15.5	ND (0.0280)	--	0.555	0.289
601577	S58B-GR-104-20-S	Soil	01-27-99	20.0–20.5	ND (0.0274)	--	0.486	0.310
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	1.55	NA	1.03	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
601348	S58B-GR-101-5-S	Soil	01-26-99	5.0–5.5	ND (0.141)	--	ND (0.459)	--
601348	S58B-GR-102-10-S	Soil	01-26-99	10.0–10.5	ND (0.152)	--	ND (0.416)	--
601577	S58B-GR-103-15-S	Soil	01-27-99	15.0–15.5	**ND (0.162)**	--	ND (0.414)	--
601577	S58B-GR-104-20-S	Soil	01-27-99	20.0–20.5	0.119	0.136	ND (0.414)	--
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.

ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Subsurface soil sample.
S58B = SWMU 58, Feature B.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.1.5.2-3
Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, Tritium Analytical Results
January 1999
(Off-Site Laboratory)

Sample Attributes					Tritium (EPA Method 906.0[a]) (pCi/L[b])	
Record Number[c]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Tritium	Accuracy +/-
601351	S58B-GR-101-5-S	Soil	01-26-99	5.0–6.0	**826**	177
601351	S58B-GR-102-10-S	Soil	01-26-99	10.0–11.0	**806**	176
601353	S58B-GR-103-15-S	Soil	01-27-99	15.0–16.0	256	202
601353	S58B-GR-104-20-S	Soil	01-27-99	20.0–21.0	126	196
Background Activity[d]					420	NA

[a]EPA November 1986.
[b]420 pCi/L = 0.021 pCi/g.
[c]Analysis request/chain-of-custody record.
[d]Tharp February 1999.
S58B = SWMU 58, Feature B.
ER = Environmental Restoration.
EPA = U.S. Environmental Protection Agency.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not applicable.
pCi/L = Picocurie(s) per liter.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Subsurface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.1.5.2-4
Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, VOC Analytical Results
April 1996 and January 1999
(Off-Site Laboratory)

Sample Attributes					VOC (EPA Method 8260[a]) (μg/kg)		
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	2-Butanone	Methylene Chloride	Toluene
SWMU 58 Feature B Borehole No. 1—April 1996							
05072	58B-BH-B-0-1.0-SS	Soil	04-22-96	0–1.0	ND (2.00 J)	ND (5.00 J)	ND (1.00 J)
05072	58B-BH-B-0-1.0-SSD	Soil	04-22-96	0–1.0	ND (2.00 J)	ND (4.40 J)	ND (1.00 J)
05072	58B-BH-B-5.0-6.0-SS	Soil	04-22-96	5.0–6.0	ND (2.00 J)	ND (3.00 J)	ND (1.00 J)
SWMU 58 Feature B Borehole No. 2—January 1999							
601351	S58B-GR-101-5-SS	Soil	01-26-99	5.0–6.0	**50 J**	**9.8 J**	**7.4 J**
601351	S58B-GR-102-10-SS	Soil	01-26-99	10.0–11.0	ND (2.1 J)	**8.0 J**	**17 J**
601353	S58B-GR-103-15-SS	Soil	01-27-99	15.0–16.0	**5.1**	ND (11)	ND (0.22)
601353	S58B-GR-104-20-SS	Soil	01-27-99	20.0–21.0	ND (2.1)	ND (12)	**3.1**
Quality Assurance/Quality Control Samples (μg/L)							
05072	58B-BH-B-TB	Soil	04-23-96	NA	ND (2.0)	ND (4.3)	**1.40 J (1.00)**
05072	58B-BH-B-FB	Water	04-22-96	NA	ND (2.0)	ND (1.00)	ND (1.00)
05072	58B-BH-B-EB	Water	04-22-96	NA	ND (2.0)	ND (1.00)	ND (1.00)
05072	58B-BH-B-TB	Water	04-22-96	NA	ND (2.0)	ND (10)	ND (1.00)
601351	S58-GR-113-EB	Water	01-26-99	NA	ND (5.9)	**1.6 JB (1.2)**	ND (0.5)
601351	S58-GR-114-FB	Water	01-26-99	NA	ND (5.9)	**3.1 JB (1.2)**	ND (0.5)
601351	S58-GR-115-TB	Water	01-26-99	NA	ND (5.9)	ND (1.2)	ND (0.5)

Note: Values in **bold** indicate detected concentrations.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

B = Analyte detected in associated blank.
BH = Borehole.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58B = SWMU 58, Feature B.
SS = Soil sample.
SSD = Subsurface soil sample duplicate.
SWMU = Solid Waste Management Unit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 4.4.1.5.2-5
Summary of VOC Analytical MDLs for SWMU 58,
Feature 58B RFI Borehole Soil Sampling
April 1996 and January 1999[a]
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8260[b]) (μg/kg)
Acetone	2.2 (5.00)
Benzene	0.25 (1.00)
Bromoform	0.27 (1.00)
2-Butanone	2.1 (2.00)
Carbon Disulfide	2.2 (2.00)
Carbon Tetrachloride	0.22 (1.00)
Chlorobenzene	0.25 (1.00)
Chlorodibromomethane	0.21 (1.00)
Chloroethane	0.72 (1.00)
Chloroform	0.24 (1.00)
Dichlorobromomethane	0.24 (1.00)
1,1-Dichloroethane	0.2 (1.00)
1,2-Dichloroethane	0.23 (1.00)
1,1-Dichloroethene	0.25 (1.00)
1,2-cis-Dichloroethene	0.25 (1.00)
1,2-trans-Dichloroethylene	0.19 (1.00)
1,2-Dichloropropane	0.23 (1.00)
cis-1,3-Dichloropropylene	0.25 (1.00)
trans-1,3-Dichloropropylene	0.22 (1.00)
Ethylbenzene	0.23 (1.00)
2-Hexanone	4.4 (5.00)
Methyl Bromide	0.67 (1.00)
Methyl Chloride	0.43 (1.00)
4-Methyl-2-pentanone	2.9 (5.00)
Methylene Chloride	0.25 (1.00)
Styrene	0.22 (1.00)
1,1,2,2-Tetrachloroethane	0.46(1.00)
Tetrachloroethene	0.23 (1.00)
Toluene	0.22 (1.00)
1,1,1-Trichloroethane	0.18 (1.00)
1,1,2-Trichloroethane	0.24 (1.00)
Trichloroethene	0.27 (1.00)
Vinyl Acetate	1.8 (5.00)
Vinyl Chloride	0.4 (1.00)
Xylenes (Total)	0.62 (1.00)

Note: The 1996 sampling MDLs are shown in parentheses.
[a]Includes Analysis Request Chain-of-Custody Records 05072, 601353, and 601351.
[b]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 4.4.1.5.2-6
Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, SVOC Analytical Results
April 1996 and January 1999
(Off-Site Laboratory)

Sample Attributes					SVOCs (EPA Method 8270[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Diethyl phthalate	bis(2-Ethylhexyl) phthalate
SWMU 58B Borehole No. 1—April 1996						
05072	58B-BH-B-0-1.0-SS	Soil	04-22-96	0–1.0	**269 J (332)**	ND (166)
05072	58B-BH-B-0-1.0-SSD	Soil	04-22-96	0–1.0	ND (128)	ND (165)
05072	58B-BH-B-5.0-6.0-SS	Soil	04-22-96	5.0–6.0	ND (256)	**408 J (658)**
SWMU 58B Borehole No. 2—January 1999						
601351	S58B-GR-101-5-S	Soil	01-26-99	5.0–6.0	ND (10)	ND (10)
601351	S58B-GR-102-10-S	Soil	01-26-99	10.0–11.0	ND (10)	ND (10)
601353	S58B-GR-103-15-S	Soil	01-27-99	15.0–16.0	ND (10)	ND (10)
601353	S58B-GR-104-20-S	Soil	01-27-99	20.0–21.0	ND (10)	ND (10)
Quality Assurance/Quality Control samples (μg/L)						
05072	58B-BH-B-EB	Water	04-22-96	NA	ND (1.42)	ND (5.00)
05072	58B-BH-B-FB	Water	04-22-96	NA	ND (1.42)	ND (5.00)
601351	S58-GR-113-EB	Water	01-26-99	NA	ND (2.1)	ND (3.7)
601351	S58-GR-114-FB	Water	01-26-99	NA	ND (2.1)	ND (3.7)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.

58B = SWMU 58, Feature B.
BH = Borehole.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
ID = Identification.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58B = SWMU 58, Feature B.
SS = Surface soil sample.
S = Subsurface soil sample.
SSD = Soil sample duplicate.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.1.5.2-7
Summary of SVOC Analytical MDLs for SWMU 58,
Feature 58B RFI Borehole Soil Sampling
April 1996 and January 1999
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (μg/kg)
Acenaphthene	10 (165–329)
Acenaphthylene	10 (165–329)
Anthracene	10 (165–329)
Benzo (a) anthracene	10 (165–329)
Benzo (a) pyrene	10 (165–329)
Benzo (b) fluoranthene	10 (165–329)
Benzo (g,h,I) perylene	10 (165–329)
Benzo (k) fluoranthene	10 (165–329)
Benzoic acid	50 (329–658)
Benzyl alcohol	10 (165–329)
4-Bromophenyl-phenyl ether	10 (165–329)
Butyl benzyl phthalate	10 (165–329)
4-Chloro-3-methyl phenol	10 (165–329)
4-Chloroaniline	20 (165–329)
bis(2-Chloroethoxy) methane	10 (165–329)
bis(2-Chloroethyl) ether	10 (165–329)
bis(2-Chloroisopropyl) ether	10 (165–329)
2-Chloronaphthalene	10 (165–329)
2-Chlorophenol	10 (165–329)
4-Chlorophenyl-phenyl ether	10 (165–329)
Chrysene	10 (165–329)
m,p-Cresol	10 (115–230)
o-Cresol	10 (120–241)
Dibenzo(a,h)anthracene	10 (165–329)
Dibenzofuran	10 (165–329)
1,2-Dichlorobenzene	10 (165–329)
1,3-Dichlorobenzene	10 (165–329)
1,4-Dichlorobenzene	10 (165–329)
3,3-Dichlorobenzidine	20 (1650–3290)
2,4-Dichlorophenol	10 (165–329)
Diethyl phthalate	10 (128–256)
Dimethyl phthalate	10 (165–329)
2,4-Dimethylphenol	10 (165–329)
Di-n-butyl phthalate	10 (165–329)
4,6-Dinitro-2-methylphenol	10 (165–329)
2,4-Dinitrophenol	20 (329–658)
2,4-Dinitrotoluene	10 (165–329)
2,6-Dinitrotoluene	10 (165–329)
Di-n-octyl phthalate	10 (165–329)
1,2-Diphenylhydrazine	10
bis(2-Ethylhexyl) phthalate	10 (165–329)
Fluoranthene	10 (165–329)
Fluorene	10 (165–329)
Hexachlorobenzene	10 (197–395)

Refer to footnotes at end of table.

Table 4.4.1.5.2-7 (Concluded)
Summary of SVOC Analytical MDLs for SWMU 58
Feature 58B RFI Borehole Soil Sampling
April 1996 and January 1999
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (μg/kg)
Hexachlorobutadiene	10 (165–329)
Hexachlorocyclopentadiene	10 (230–461)
Hexachloroethane	10 (165–329)
Indeno (1,2,3-cd) pyrene	10 (165–329)
Isophorone	10 (165–329)
2-Methylnaphthalene	10 (165–329)
Naphthalene	10 (165–329)
m-Nitroaniline	10 (256–513)
o-Nitroaniline	10 (165–329)
p-Nitroaniline	10 (135–270)
Nitrobenzene	10 (165–329)
2-Nitrophenol	10 (165–329)
4-Nitrophenol	10 (165–329)
N-Nitroso-di-n-propylamine	10 (165–329)
N-Nitrosodiphenylamine	10 (165–329)
Pentachlorophenol	20 (263–526)
Phenanthrene	10 (165–329)
Phenol	10 (165–329)
Pyrene	10 (165–329)
1,2,4-Trichlorobenzene	10 (165–329)
2,4,5-Trichlorophenol	10 (165–329)
2,4,6-Trichlorophenol	10 (165–329)

Note: The 1996 sampling detection limits are shown in parentheses.
[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.1.5.2-8
Summary of SWMU 58, Feature 58B RFI Borehole Soil Sampling, TPH Analytical Results
April 1996 and January 1999
(Off-Site Laboratory)

Sample Attributes					TPH (EPA Method 8015[b]) (mg/kg)
Record Number[a]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	
SWMU 58B Borehole No.1—April 1996					
05072	58B-BH-B-0-1.0-SS	Soil	04-22-96	0–1.0	ND (0.331 J)[c]
05072	58B-BH-B-0-1.0-SSD	Soil	04-22-96	0–1.0	**1.56 J**[c]
05072	58B-BH-B-5.0-6.0-SS	Soil	04-22-96	5.0–6.0	**1.23 J**[c]
SWMU 58B Borehole No. 2—January 1999					
601351	S58B-GR-101-5-S	Soil	01-26-99	5.0–6.0	ND (1.67 J)
601351	S58B-GR-102-10-S	Soil	01-26-99	10.0–11.0	ND (1.67 J)
601353	S58B-GR-103-15-S	Soil	01-27-99	15.0–16.0	ND (0.76)
601353	S58B-GR-104-20-S	Soil	01-27-99	20.0–21.0	ND (0.83)
Quality Assurance Samples (mg/L)					
05072	58B-BH-B-FB	Water	04-22-96	NA	ND (0.00100)[c]
05072	58B-BH-B-EB	Water	04-22-96	NA	ND (0.00100)[c]
601351	S58-GR-113-FB	Water	01-26-99	NA	ND (0.007 J)
601351	S58-GR-113-EB	Water	01-26-99	NA	ND (0.007 J)

Note: Values in **bold** indicate detected concentrations.
[a]Analysis request/chain-of-custody record.
[b]EPA November 1986.
[c]Analyzed by gas chromatograph/flame ionization detector as Jet Propulsion (JP)-4 fuel.
58B = SWMU 58, Feature B.
BH = Borehole.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Subsurface soil sample.
SS = Soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.

Table 4.4.1.5.2-9
Summary of HE Compounds Analytical MDLs for
SWMU 58, Feature 58B RFI Borehole Soil Sampling
April 1996 and January 1999[a]
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[b]) (μg/kg)
m-Dinitrobenzene	4.1 (80.0)
2,4-Dinitrotoluene	6.2 (80.0)
2,6-Dinitrotoluene	6.5 (80.0)
2-amino-4,6-Dinitrotoluene	6.6 (80.0)
4-amino-2,6-Dinitrotoluene	5.5 (80.0)
HMX	5.3 (240)
Nitrobenzene	5.2 (80.0)
m-Nitrotoluene	11 (80.0)
o-Nitrotoluene	7.8 (80.0)
p-Nitrotoluene	11 (80.0)
RDX	9.7 (240)
Tetryl	7.5 (160)
sym-Trinitrobenzene	6.6 (80.0)
2,4,6-Trinitrotoluene	5.7 (80.0)

Note: The 1996 sampling method detection limits are shown in parentheses.
[a]Analysis Request/Chain-of-Custody Records 05072, 601351, and 601353.
[b]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

The TB samples were analyzed off site for VOCs. Toluene was detected in one TB sample at a J (estimated) value.

RPDs were calculated for metals detected in the primary and duplicate samples, both of which were analyzed by GEL. The metals analyses for the sample pair for arsenic, beryllium, cadmium, chromium, lead, selenium, and silver yielded RPDs that exceeded the acceptable RPD limit of 25 percent (Table 4.4.1.5.3-1). Although the RPDs presented in Table 4.4.1.5.3-1 exceed the RPD limit, the values are typical of the heterogeneous uncontaminated soil and are therefore acceptable.

Data Validation Results for SWMUs 8Y and 58B (Debris Pile and Pit)

The off-site laboratory results from GEL were reviewed according to "Data Verification/ Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirmed that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For AR/COC 5072, qualifications were applied to metal and organic data for soil and aqueous sample results. Chromium was detected in the method blank for the EB samples and the results were qualified as J (estimated) in the associated samples. The MS/MSD percent recoveries for lead were outside the QC limits, and the associated sample results were qualified as J (estimated). Copper had a MS percent recovery that exceeded QC limits, and the associated sample results were qualified as J (estimated). Methylene chloride was detected in the method blank and the associated sample results were qualified as J (estimated). No other analytical data required qualification during validation.

For AR/COC 601351, qualifications were applied for metal, VOC, SVOC, and TPH data. No qualifications were applied to HE compound data. No MS samples were analyzed, and the associated sample results for metals were qualified as J (estimated). Methylene chloride was detected in the aqueous method blank, and the sample results were qualified. No MS/MSD samples were analyzed for soil VOCs, and no LCSD samples were available for soil VOCs; therefore, the associated sample results were qualified as J (estimated). The aqueous TPH MS recovery was outside of QC limits, and the associated sample results were qualified as J (estimated). No other analytical data required qualification during validation.

For AR/COC 601353, no qualifications were applied to sample results for detected analytes.

Table 4.4.1.5.3-1
Summary of SWMU 58, Feature 58B Borehole Field Duplicate Relative Percent Difference Values
April 1996
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference									
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Mercury	Nickel	Lead	Selenium	Silver
5072	58B-BH-B-0-1.0-SS	0–1.0	53.60	0.74	31.77	73.15	57.24	15.60	19.24	58.85	57.60	52.26
	58B-BH-B-0-1.0-SSD	0–1.0										

[a]Analysis request/chain-of-custody record.
58B = SWMU 58, Feature B.
BH = Borehole.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

4.4.1.6 Data Gaps for SWMU 8 RFI Sampling

No data gaps remained after the RFI sampling discussed in this section. The surface soil sampled during the RFI was later removed during the VCM discussed in Section 4.5. The subsurface sampling did not reveal significantly elevated levels of COCs. The slightly elevated COCs present were isolated occurrences and showed no trend. The sample results were submitted for risk assessment analysis as discussed in Chapter 5.0.

4.4.2 SWMU 58 RFI Sampling

Numerous RFI sampling events were conducted between June 1995 and 2001 to characterize SWMU 58. Several discrete areas or features were investigated. The RFI sampling activities at the various SWMU 58 features discussed in the OU 1332 RFI Work Plan (SNL/NM June 1995) are presented in this section. Additional locations not identified at the time the Work Plan was approved are also presented.

All soil samples for SWMU 58 were collected in accordance with ER FOPs 94-52 and 95-23 (SNL/NM December 1994 and November 1995) using standard equipment (i.e., stainless steel bowl, hand trowel) and standard decontamination procedures in accordance with ER FOP 94-57 (SNL/NM May 1994). Samples were managed in accordance with ER FOP 94-34 (SNL/NM May 1995). SNL/NM chain-of-custody and sample documentation procedures were followed for all samples collected.

To simplify the reporting of the results of the RFI activities at SWMU 58, many of the individual features were combined into "sampling groups" based upon similar testing activities. For example, features that involved the detonation of explosives were combined together as "Test Locations Involving Detonation of Explosives." Other features involved extensive testing within a single feature (e.g., HALO Bunker–SWMU 58G). The following lists all the features sampled at SWMU 58, including those combined into sampling groups:

- Test Locations Involving Detonation of Explosives (SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z)—Section 4.4.2.2
- Test Locations Involving Burn Tests (SWMUs 58FF, 58I, 58O, 58TT, 58UU, 58VV)—Section 4.4.2.3
- HALO Bunker (SWMU 58G)—Section 4.4.2.4
- UCS (SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF)—Section 4.4.2.5
- Earth Mound (SWMU 58E)—Section 4.4.2.6
- Miscellaneous Sites (Mounds and Trenches, SWMUs 58OO, 58SS, 58WW, 58XX, 58YY, 58ZZ, 58AAA, and 58CCC)—Section 4.4.2.7

Each individual SWMU 58 feature sampled (see Figure 2.1-3), and its corresponding sampling/investigation date(s) are as follows:

<u>Test Locations Involving Detonation of Explosives</u>

- Former location of Shot Tank, SWMU 58F—soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; samples collected in March 1996, October 1997, and September 1998

- Small pit and borrow mound, SWMU 58H—soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; samples collected in March 1996, October 1997, and September 1998

- Concrete pad with trenches, SWMU 58J—soil sampling at eight locations around the perimeter of the pad plus one sample collected from the center; samples collected in September 1998

- Degraded asphalt pad, SWMU 58L—soil sampling at eight locations around the perimeter of the pad plus one sample collected from the center; samples collected in September 1998

- Blast Point for Force-On-Structure Tests, SWMU 58S—soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; samples collected in October 1997

- Former location of Electromagnetic/Doppler Radar Tests, SWMU 58U—soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; samples collected in March 1996 and November 1997

- Blast-Loading-On-Pavement Firing Point, SWMU 58X—soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; samples collected in May 1996

- Greenhouse Test-Blast Point, SWMU 58Z, soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; also three subsurface samples collected from the center of the site; samples collected in June 1995 and in April and May 1996

Test Locations Involving Burn Tests

- Pile of fire bricks, SWMU 58FF—soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; also 14 boreholes advanced at the site to depths of up to 50 feet bgs; samples collected in June 1995, April 1996, August 1996, April 1997, and January 1999

- Missile Trap Test Location, SWMU 58I—soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; also one sample collected from beneath each of the three wooden pallets at the site, and one subsurface sample collected from the center of the site; samples collected from April to May 1996 and in December 1997

- Empty pit, SWMU 58O—soil sampling at 16 randomly selected locations along a radial pattern plus one sample collected at the center; also three subsurface samples collected from the center of the site; samples collected in April 1996 and December 1997

- Fire Brick Area No. 2, SWMU 58TT—remediation performed in February and March 1999 followed by confirmatory soil sampling at six locations; samples collected in March 1999

- Fire Brick Area No. 3, SWMU 58UU—housekeeping debris removal conducted in January 1999 followed by soil sampling at 12 judgmentally selected locations; samples collected in January 1999 and March 2000

- Fire Brick Area No. 1, SWMU 58VV—housekeeping conducted in January 1999 followed by soil sampling at two judgmentally selected locations; samples collected in January 1999

HALO Bunker

- HALO Bunker, SWMU 58G—soil sampling at six randomly selected locations north of the open side of the bunker; two random swipe samples collected from each of the three bunker walls and three from the bunker floor; one sediment sample collected at the bottom of the concrete pit located north of the firing point in the bunker; samples collected in April 1996

Underground Conduit System

- UCS (SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF)—soil sampling at 6 manholes and subsurface soil sampling at 22 boreholes in March and April 1996, followed by a VCA to remove the entire conduit system in October and November 2000, followed by confirmatory soil sampling at 10 locations; samples collected in March and April 1996 and October and November 2000

Earth Mound

- Earth mound with buried debris, SWMU 58E—soil sampling at 26 judgmentally selected sample locations from areas in and around the mound; samples collected in May 1996 and February 1997

Mounds and Trenches

- Mounds and trenches—no soil sampling performed. Exploratory trenching conducted at 25 mound features and 12 surface depression features; trenching conducted in December 1998

Miscellaneous Sites

- Open Borehole, SWMU 58OO—open borehole backfilled with soil and subsurface soil sampling at the 40- to 65-foot depths in the borehole; samples collected in April 1997

- Open Borehole No. 1, SWMU 58SS—open borehole backfilled with soil and subsurface soil sampling at 5- to 15-foot depths in borehole; samples collected in January 1999

- Concrete Pads Nos. 1 and 2, SWMUs 58YY and 58XX—soil sampling at one judgmentally selected location downgradient from each feature; samples collected in January 1999

- Three wooden poles and metal pipe, SWMU 58WW—soil sampling at one judgmentally selected location adjacent to the pipe; samples collected in January 1999

- Open Borehole No. 2, SWMU 58ZZ—open borehole backfilled and subsurface soil sampling at 3- to 7-foot depths in the borehole; samples collected in January 1999

- Building 9800 Dry Well, SWMU 58AAA—soil sampling at one judgmentally selected location directly beneath the gravel at the bottom of the dry well; samples collected in January 1999

- Building 9805 Drainpipe, SWMU 58CCC—soil sampling at seven judgmentally selected locations beneath the entire length of pipe; samples collected in September 1996

Table 4.4.2-1 provides a summary of field activities conducted at SWMU 58. The VCM, VCA, and housekeeping activities are discussed in greater detail in Section 4.5.

4.4.2.1 Nonsampling Data Collection

Site visits were conducted prior to RFI planning. The visits confirmed site conditions and at times added features or COCs to be sampled at a given location. Samples were screened for radiation in the field using a beta/gamma meter. Elevated radiation levels found at some of the sample locations and on sample containers during this phase of the investigation are noted in field logbooks.

4.4.2.2 SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z (SWMU 58 Test Locations Involving Detonation of Explosives)

Eight features involved the detonation of explosives at or above ground level. The detonation tests took place throughout SWMU 58 and included the following:

- Tests designed to contain shrapnel in a metal tank (SWMU 58F)
- HALO experiments (other than the HALO Bunker tests) (SWMU 58H)
- Height-of-Burst tests involving 2,4,6-trinitrotoluene spheres (SWMUs 58J and 58L)
- Force-on-Structure tests (SWMUs 58S and 58Z)
- Electromagnetic/Doppler radar tests (SWMU 58U)
- Blast-Loading-on-Pavements tests (SWMU 58X)

These tests may have resulted in the generation of metal fragments/shrapnel and HE combustion by-products. The OU 1332 RFI Work Plan (SNL/NM June 1995) presents a complete description of these features and associated tests. This section discusses the RFI sampling conducted at these features and the analytical results.

Table 4.4.2-1
Summary of Field Activities Conducted at SWMU 58

Sampling Group	SWMU 58 Feature	Surveys/Sampling			Housekeeping/VCMs/VCAs		
		UXO/HE Survey	Radiation Survey	Soil Sampling	Nonradioactive Housekeeping Debris Removal	Trenching	Radioactive VCM/ VCA Debris Removal
Test Locations Involving Detonation of Explosives	Former location of Shot Tank, Feature 58F	October 1993	October–November 1993	March 1996, October 1997, September 1998[a]	January 1998–March 1999	NA	NA
	Small pit and borrow mound, Feature 58H	October 1993	October–November 1993	March 1996, October 1997, September 1998[a]	January 1998–March 1999	NA	NA
	Concrete pad with trenches for running cable, Feature 58J	October 1993	October–November 1993	September 1998[b]	January 1998–March 1999	NA	NA
	Degraded asphalt pad, Feature 58L	October 1993	October–November 1993	September 1998[b]	January 1998–March 1999	NA	NA
	Blast Point for Force-On-Structure tests, 58S	October 1993	October–November 1993	October 1997[c]	January 1998–March 1999	NA	NA
	Electromagnetic/Doppler radar test site, Feature 58U	October 1993	October–November 1993	March 1996, November 1997[a]	January 1998–March 1999	NA	NA
	Blast-loading-pavement firing point, Feature 58X	October 1993	October–November 1993	May 1996[c]	January 1998–March 1999	NA	NA
	Greenhouse test-blast point, Feature 58Z	October 1993	October–November 1993	June 1995 April–May 1996[c]	January 1998–March 1999	NA	NA

Refer to footnotes at end of table.

Table 4.4.2-1 (Continued)
Summary of Field Activities Conducted at SWMU 58

Sampling Group	SWMU 58 Feature	Surveys/Sampling			Housekeeping/VCMs/VCAs		
		UXO/HE Survey	Radiation Survey	Soil Sampling	Nonradioactive Housekeeping Debris Removal	Trenching	Radioactive VCM/ VCA Debris Removal
Test Locations Involving Burn Tests	Pile of Fire Bricks, Feature 58FF	October 1993	October–November 1993; October 1996	June 1995, April 1996, August 1996, April 1997, January 1999[d]	January 1998–March 1999	NA	October 1996 (Geotech VCM)[e]
	Missile Trap Test location, Feature 58I	October 1993	October–November 1993	April–May 1996, December 1997[f]	January 1998–March 1999	NA	January–March 1998 (Asbestos Removal)
	Empty pit with mound to the north, Feature 58O	October 1993	October–November 1993	April 1996, December 1997[f]	January 1998–March 1999	NA	NA
	Fire Brick Area No. 2, Feature 58TT	October 1993	October–November 1993	March 1999[g]	January 1998–March 1999	NA	February–March 1999
	Fire Brick Area No. 3, Feature 58UU	October 1993	October–November 1993	January 1999, March 2000[h]	January 1998–March 1999	NA	NA
	Fire Brick Area No. 1, Feature 58VV	October 1993	October–November 1993	January 1999[i]	January 1998–March 1999	NA	NA
HALO Bunker	HALO Bunker , Feature 58G	October 1993	October–November 1993	April 1996[j]	January 1998–March 1999	NA	NA
Underground Conduit System	Underground Conduit Manhole cover, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF	October 1993	October–November 1993, January 1994, October 1998, August 2000	March–April 1996 , October–November 2000[k]	January 1998–March 1999	October–November 2000	October–November 2000

Refer to footnotes at end of table.

Table 4.4.2-1 (Continued)
Summary of Field Activities Conducted at SWMU 58

Sampling Group	SWMU 58 Feature	Surveys/Sampling			Housekeeping/VCMs/VCAs		
		UXO/HE Survey	Radiation Survey	Soil Sampling	Nonradioactive Housekeeping Debris Removal	Trenching	Radioactive VCM/ VCA Debris Removal
Earth Mound	Soil mound with buried debris, Feature 58E	October 1993	October–November 1993	May 1996, February 1997[l]	January 1998–March 1999	May 1996	NA
Miscellaneous Sites	Mound and Trenches	October 1993	October–November 1993	No Sampling Conducted	January 1998–March 1999	December 1998	NA
	Open Borehole, Feature 58OO	October 1993	October–November 1993	April 1997[n]	January 1998–March 1999	NA	NA
	Open Borehole No. 1, Feature 58SS	October 1993	October–November 1993	January 1999[o]	January 1998–March 1999	NA	NA
	Concrete Pads Nos. 1 and 2, Features 58YY and 58XX	October 1993	October–November 1993	January 1999[m]	January 1998–March 1999	NA	NA
	Three Wooden Poles and Metal Pipe, Feature 58WW	October 1993	October–November 1993	January 1999[m]	January 1998–March 1999	NA	NA
	Open Borehole No. 2, Feature 58ZZ	October 1993	October–November 1993	January 1999[p]	January 1998–March 1999	NA	NA
	Building 9800 Dry Well, Feature 58AAA	October 1993	October–November 1993	January 1999[q]	January 1998–March 1999	January 1999	NA
	Building 9805 Drainpipe, Feature 58CCC	October 1993	October–November 1993	September 1996[r]	January 1998–March 1999	September 1996	NA

[a]Soil samples were collected at 16 randomly selected sample locations along a radial pattern plus one sample collected from the center at Features 58F, 58H, and 58U, and analyzed for metals, HE, and radionuclides by gamma spectroscopy; three samples were collected from Feature 58U and analyzed for gross alpha/gross beta; five samples were collected from all three features and analyzed for isotopic uranium/thorium by alpha spectroscopy and cesium-137 by gamma spectroscopy.

Table 4.4.2-1 (Continued)
Summary of Survey and Sampling Field Activities Conducted at SWMU 58

[b]Soil samples were collected at eight locations around the perimeter of the pad and one sample collected from the center of Features 58J and 58L, and analyzed for HE and radionuclides by gamma spectroscopy.
[c]Soil samples were collected at 16 randomly selected sample locations along a radial pattern plus one sample collected from the center at Features 58S, 58X, and 58Z; three subsurface samples were collected at the center of Feature 58Z; samples were analyzed for HE and radionuclides by gamma spectroscopy; one sample from Feature 58X was analyzed for isotopic uranium/thorium by alpha spectroscopy and cesium-137 by gamma spectroscopy.
[d]Soil samples were collected at 16 randomly selected sample locations along a radial pattern plus one sample collected from the center ; also 14 boreholes advanced at depths of up to 50 ft bgs ; samples were analyzed for metals, HE, SVOC, VOC, and radionuclides by gamma spectroscopy.
[e]Rust Geotech Inc. performed a surface radiological VCM to remove surface debris and soil with elevated radiation.
[f]Soil samples were collected at 16 randomly selected sample locations along a radial pattern plus one sample collected from the center at Features 58I and 58O; also collected one sample under each of the three wooden pallets at Feature 58I; also subsurface samples were collected from the center of each feature; samples were analyzed for SVOC, VOC, TPH, metals, HE, and radionuclides by alpha spectroscopy.
[g]Remediation performed, then confirmatory soil samples were collected at 6 judgmentally selected sample locations and analyzed for metals, HE, and radionuclides by gamma spectroscopy.
[h]Soil samples were collected at 12 judgmentally selected sample locations and analyzed for metals and radionuclides by gamma spectroscopy.
[i]Soil samples were collected at 2 judgmentally selected sample locations and analyzed for metals, HE, and radionuclides by gamma spectroscopy.
[j]Two random wipe samples were collected from each of the 3 bunker walls and 3 from the bunker floor; 1 sediment sample was collected from the bottom of the concrete pit; and 6 soil samples were collected at random locations north of the open side of the bunker; samples were analyzed for metals and radionuclides by gamma spectroscopy.
[k]Surface soil samples were collected from within each of the 6 manholes; also 22 boreholes were drilled along the entire length of the underground conduit system, including 18 random locations and 4 locations immediately down gradient of manholes. At each borehole, samples were collected at 1 ft below the conduit and approximately 6 ft below the conduit; samples were analyzed for VOC and radionuclides by gamma spectroscopy.
[l]Soil samples were collected at 26 judgmentally selected sample locations in and around the mound; samples were analyzed for metals and one sample was analyzed for radionuclides by gamma spectroscopy.
[m]Soil sample was collected at 1 judgmentally selected location down gradient from the feature (at Feature 58WW, the sample was collected adjacent to the pipe); the sample was analyzed for HE and radionuclides by gamma spectroscopy.
[n]Subsurface soil samples collected at 40-65 ft depths in the borehole and analyzed for metals, HE, VOC, SVOC and radionuclides by gamma spectroscopy.
[o]Subsurface soil samples collected at 5-15 ft depths in the borehole and analyzed for metals, HE, VOC, SVOC and radionuclides by gamma spectroscopy.
[p]Subsurface soil samples collected at 3-7ft depths in the borehole and analyzed for metals, HE, VOC, SVOC and radionuclides by gamma spectroscopy.

Table 4.4.2-1 (Concluded)
Summary of Survey and Sampling Field Activities Conducted at SWMU 58

[q]Soil sample collected at 1 judgmentally selected location immediately beneath the gravel at the bottom of the dry well and analyzed for metals, HE, VOC, TPH, and radionuclides by gamma spectroscopy.
[q]Soil samples were collected at 6 judgmentally selected locations immediately beneath the entire length of pipe and analyzed for metals, HE, VOC, SVOCs and radionuclides by gamma spectroscopy.

bgs = Below ground surface.
ft = Foot (feet).
HE = High explosive(s).
NA = Not applicable.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.
UXO = Unexploded ordnance.
VCA = Voluntary Corrective Action.
VCM = Voluntary Corrective Measure.
VOC = Volatile organic compound.

4.4.2.2.1 Sampling Activities at SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z (SWMU 58 Test Locations Involving Detonation of Explosives)

SWMUs 58F, 58H, and 58U

SWMUs 58F, 58H, and 58U involved tests with cased explosives detonated at ground level. Because these sites were used for similar tests, similar RFI sampling was conducted at each site. At each feature, 16 samples were collected at random locations along a radial pattern, and one sample was collected at the center of the site. Sample locations for SWMUs 58F, 58H, and 58U are shown in Figures 4.4.2.2.1-1, 4.4.2.2.1-2, and 4.4.2.2.1-3, respectively.

The samples were analyzed for metals and HE compounds at GEL and ERCL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory. Three samples from SWMU 58U were analyzed for gross alpha/beta activity at GEL. Five samples from all three sites were analyzed for isotopic uranium/thorium by alpha spectroscopy and cesium-137 by gamma spectroscopy at GEL. The sample locations for gross alpha/beta activity and isotopic uranium/thorium are the same sample locations where samples were collected for metals analysis.

SWMUs 58S, 58X, and 58Z

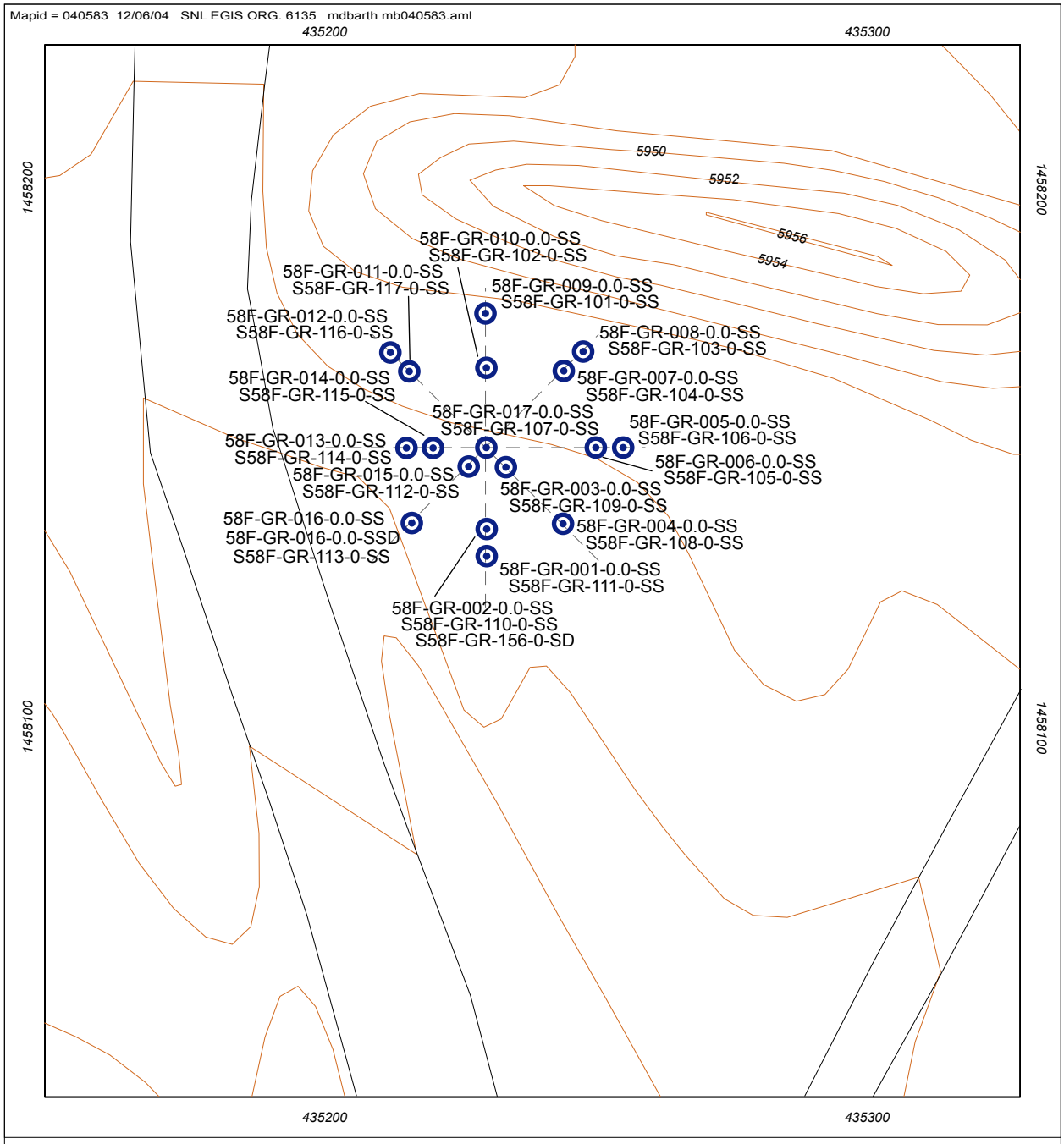
SWMUs 58S, 58X, and 58Z involved tests with uncased explosives detonated at ground level. At each feature, 16 samples were collected at random locations along a radial pattern, and one sample was collected at the center of the site. In addition, three subsurface samples were collected from the center of SWMU 58Z (refusal was encountered at the fourth depth interval). Sample locations for SWMUs 58S, 58X, and 58Z are shown in Figures 4.4.2.2.1-4, 4.4.2.2.1-5, and 4.4.2.2.1-6, respectively.

Metals were not considered COCs at these sites; therefore, no metals analysis was performed. All surface samples were analyzed for HE compounds at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory. Subsurface samples collected from SWMU 58Z were analyzed for HE only. Because elevated activities were detected in one sample from SWMU 58X during field-screening, the sample was analyzed for isotopic uranium/thorium by alpha spectroscopy and cesium-137 by gamma spectroscopy at GEL.

SWMUs 58J and 58L

SWMUs 58J and 58L involved tests with uncased explosives detonated above ground level. At each feature, eight samples were collected around the perimeter of the pad and one sample was collected at the center. Sample locations for SWMUs 58J and 58L are shown in Figures 4.4.2.2.1-7 and 4.4.2.2.1-8, respectively.

Metals were not considered COCs at these sites; therefore, no metals analysis was performed. Samples were analyzed for HE compounds at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.



Legend

- Randomly selected sample location
- 2-Foot Elevation Contour
- Sample grid

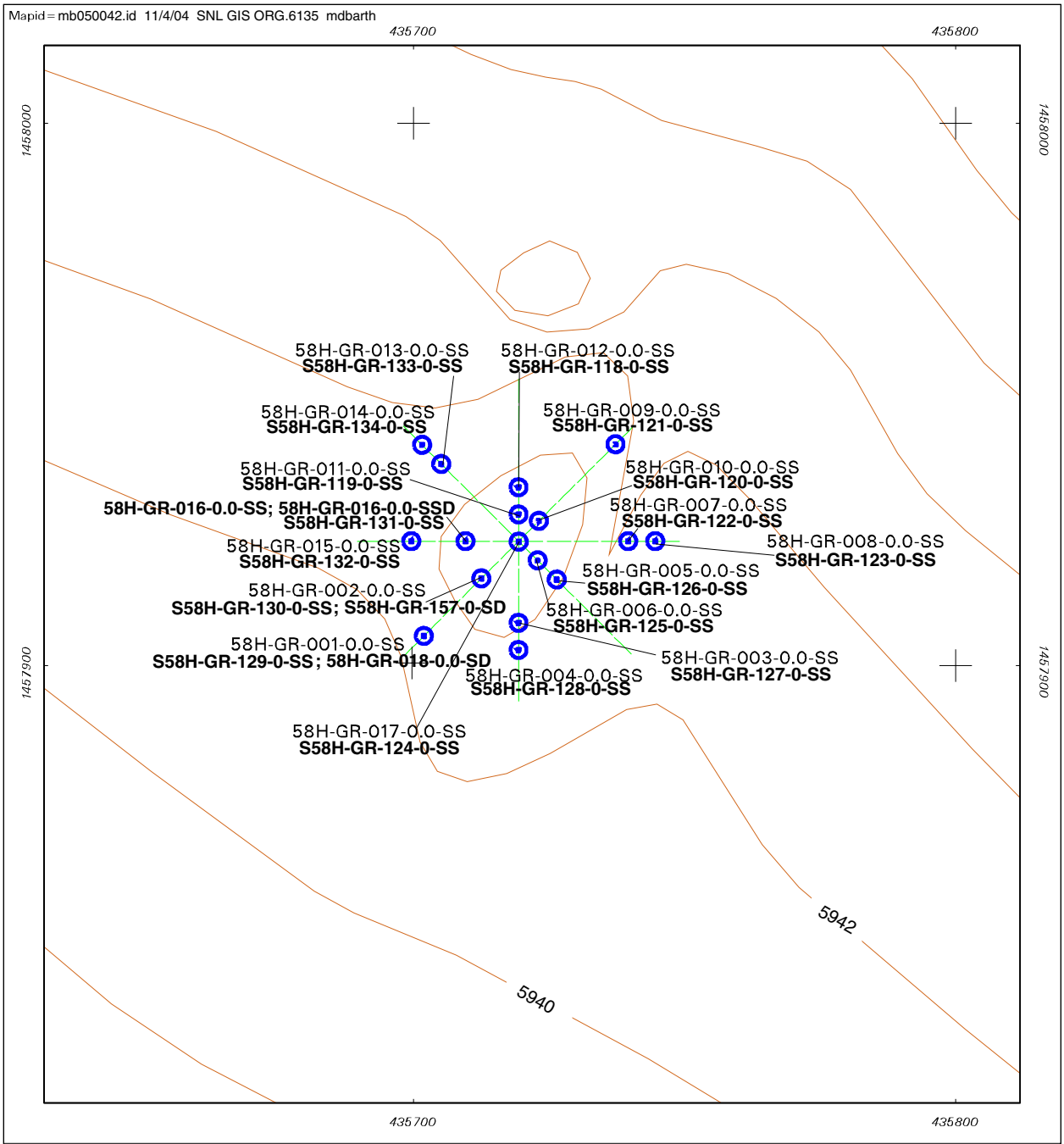
Figure 4.4.2.2.1-1
Soil sample locations at
Feature 58F

0 15 30
Scale in Feet

0 3.6 7.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A59



Legend

Randomly selected sampling location; 58H-GR-001-0.0-SS through 58H-GR-017-0.0-SS are sample numbers for metals and radionuclides; S58H-GR-118-0-SS through S58H-GR-134-0-SS are sample numbers for high explosives.

2-Foot Elevation Contour

Sample Grid

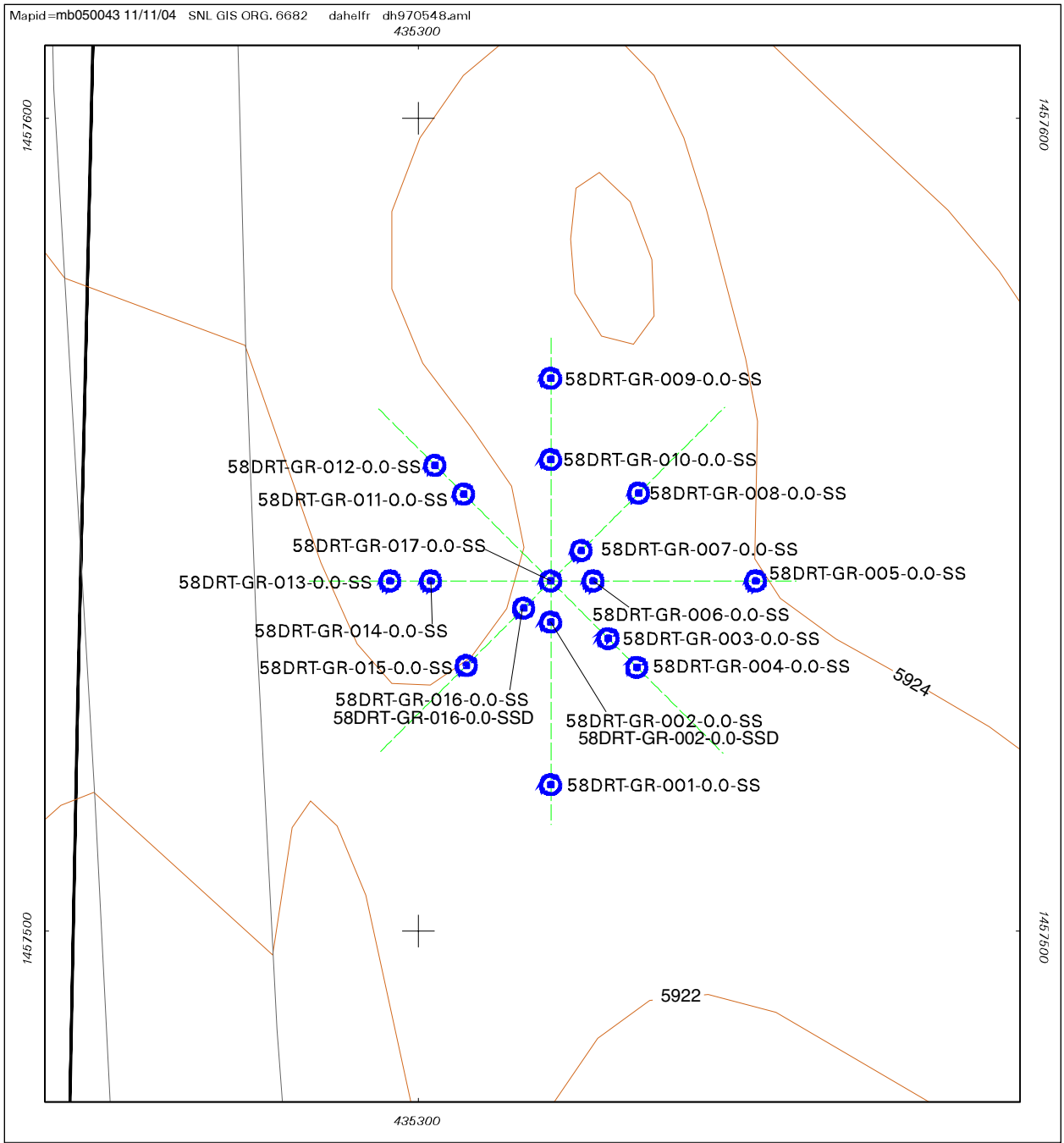
Figure 4.4.2.2.1-2
Soil sample locations at Feature 58H

0 15 30
Scale in Feet

0 3.6 7.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A20



Legend

- Randomly selected sampling location
- Road
- 2-Foot Contour
- SWMU 8 Boundary
- Sample Grid

Figure 4.4.2.2.1-3
Soil sample locations
at Feature 58U

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

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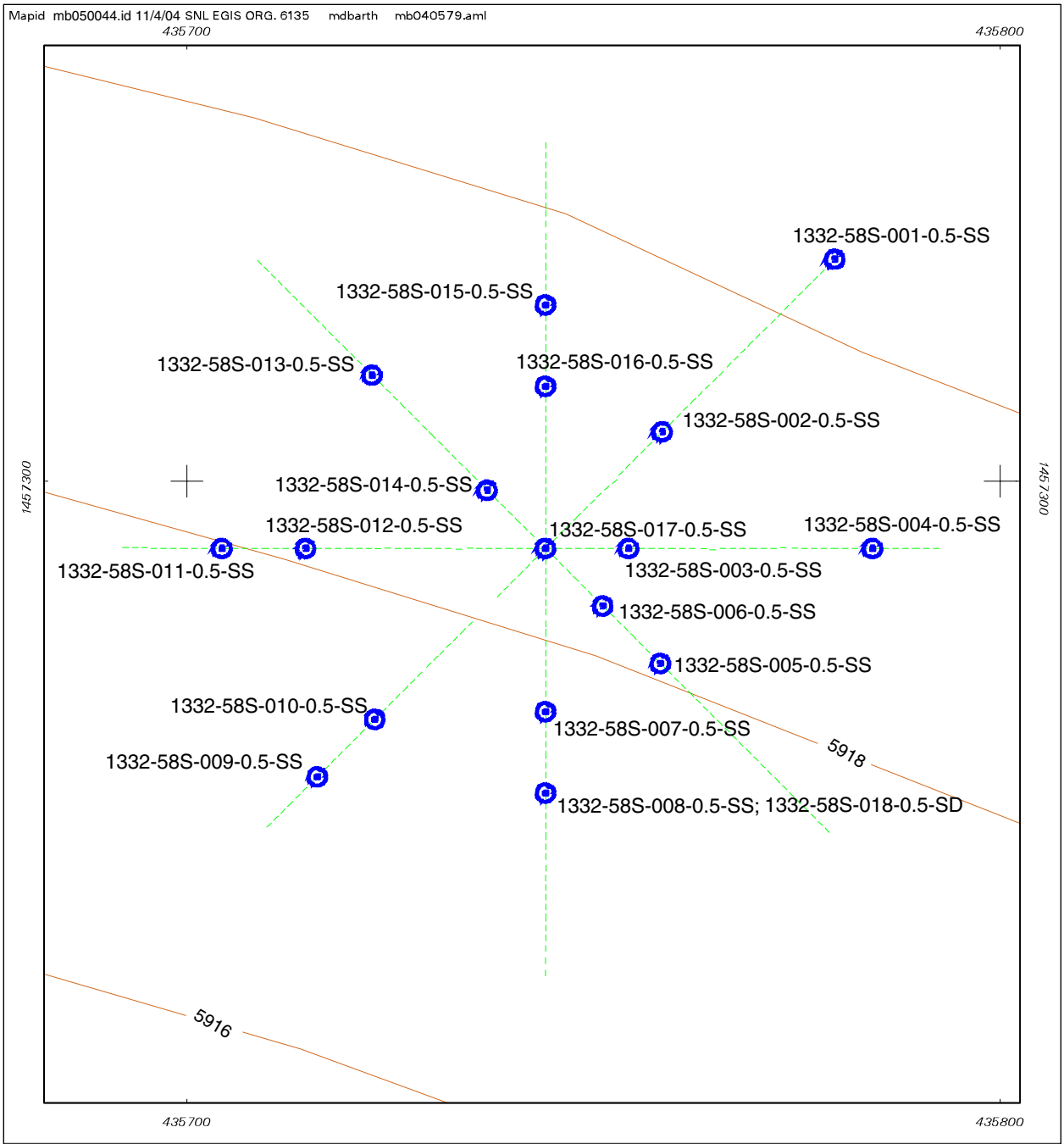
Environmental Geographic Information System

840857.06040000 A19



Legend

- Randomly selected sample location
- Grid Line
- 2-ft Contour

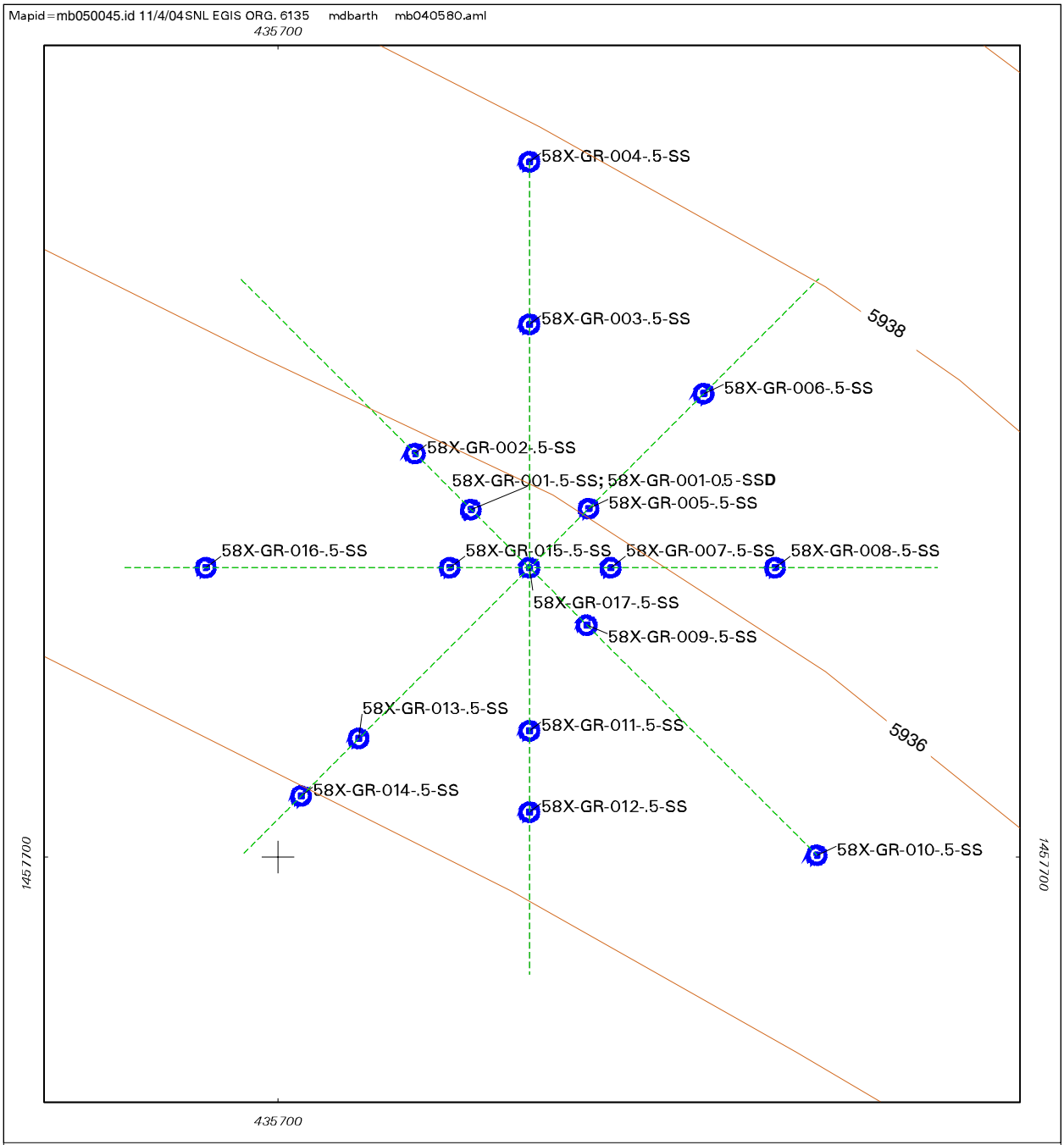
Figure 4.4.2.2.1-4
Soil sample locations
at Feature 58S

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A18



Legend

- Random selected sample location
- Grid Line
- 2-ft Contour

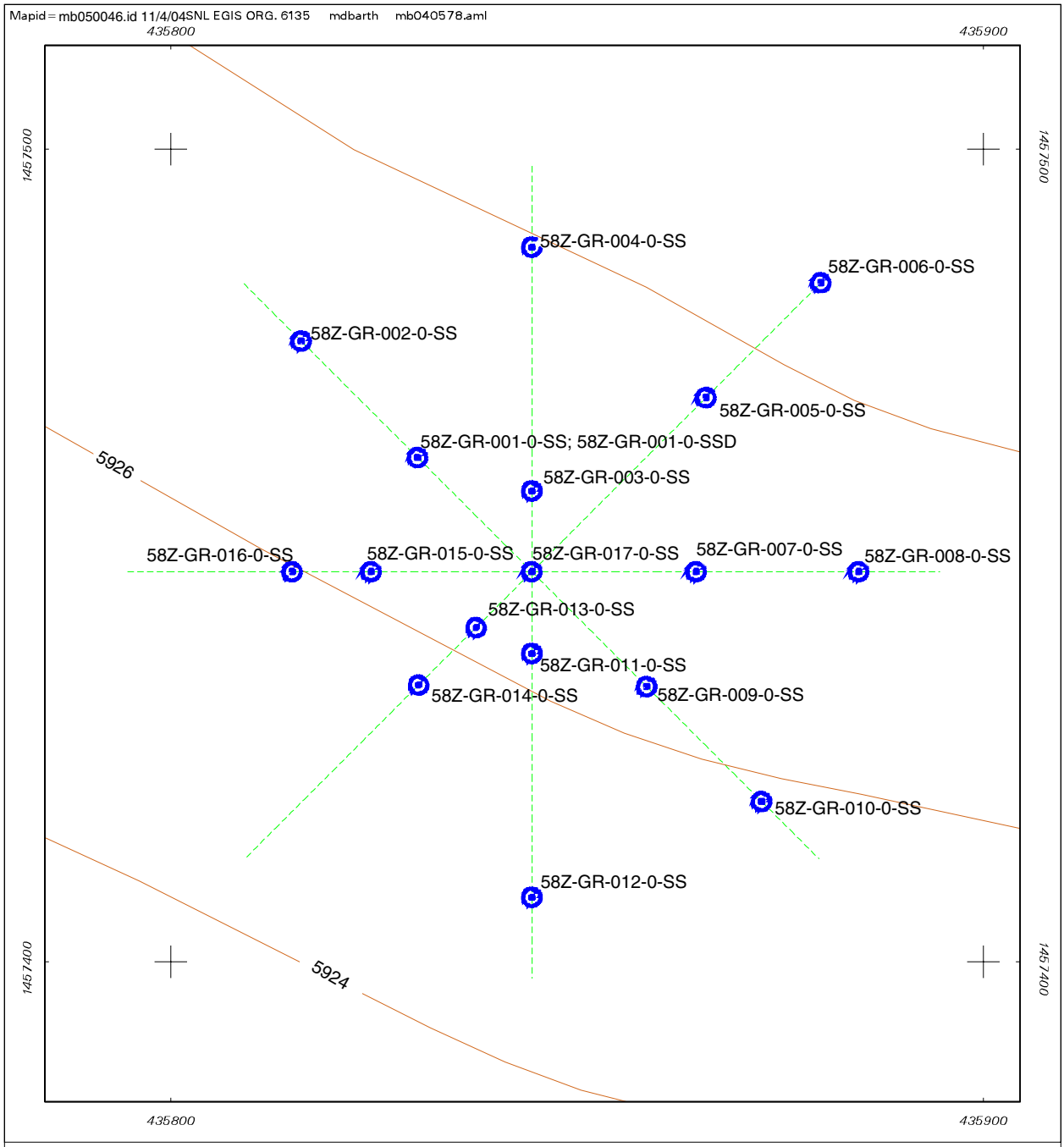
Figure 4.4.2.2.1-5
Soil sample locations at Feature 58X

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A17



Legend

- Random selected sample location
- Grid Line
- 2-ft Contour

Figure 4.4.2.2.1-6
Soil sample locations at Feature 58Z

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

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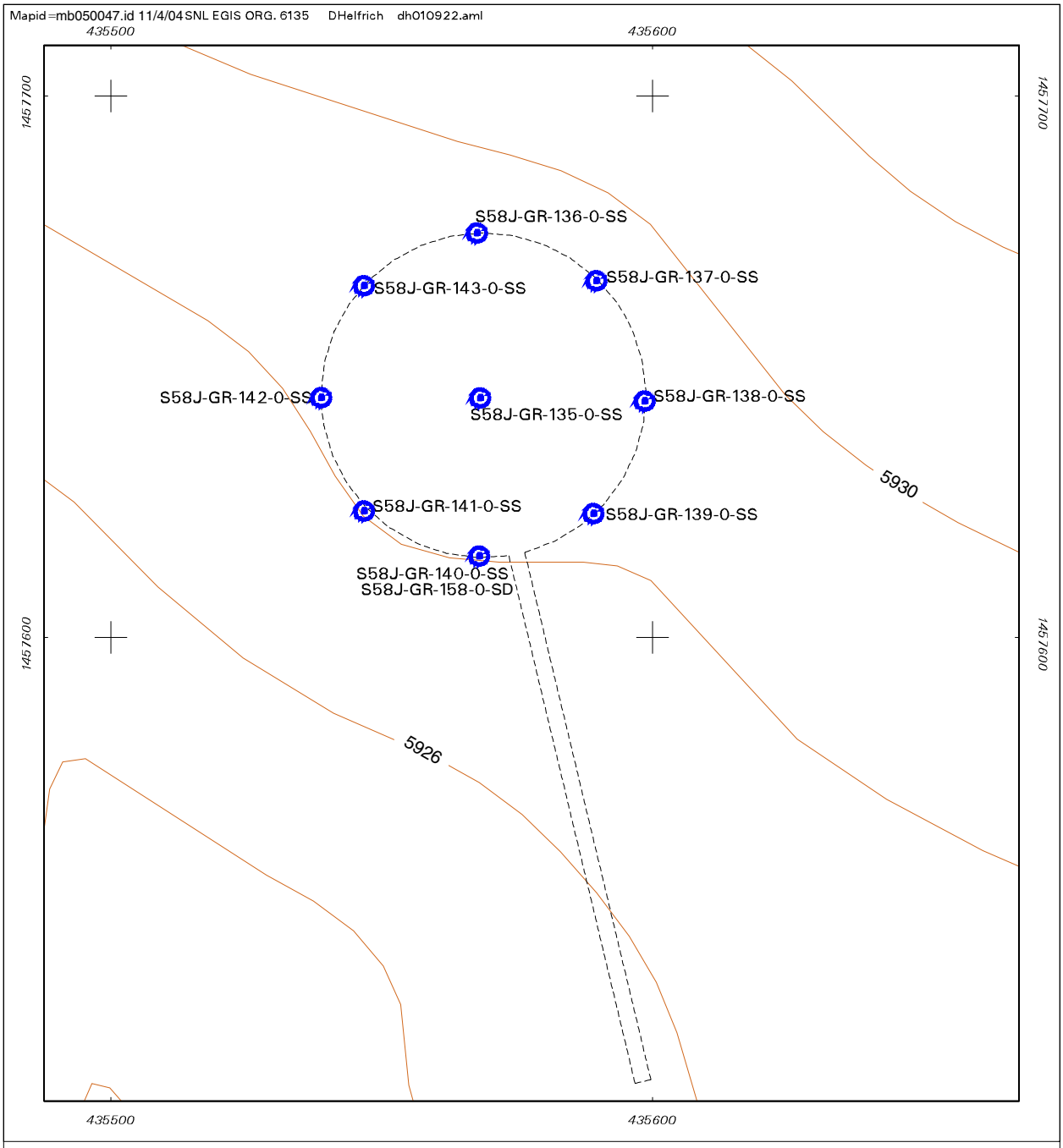
Environmental Geographic Information System

840857.06040000 A16



Legend

- Sample location
- 2-Foot Contour
- Physical feature

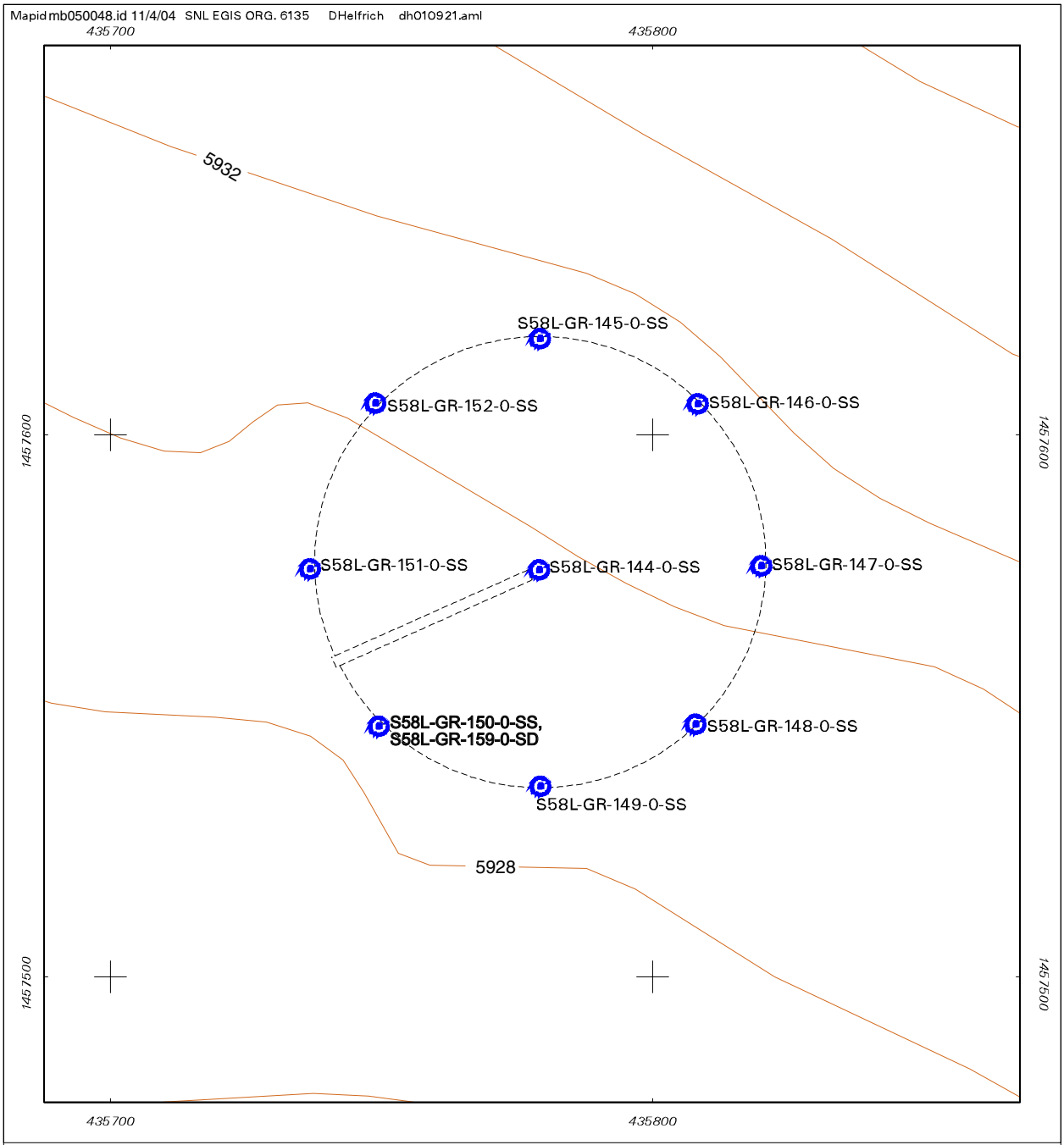
Figure 4.4.2.2.1-7
Soil sample locations at
Feature 58J

0 15 30
Scale in Feet

0 3.6 7.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A15



Legend

- Sample location
- 2-Foot Contour
- Physical feature

Figure 4.4.2.2.1-8
Soil sample locations at
Feature 58L

0 15 30
Scale in Feet

0 3.6 7.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A14

4.4.2.2.2 Sampling Results for SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z (SWMU 58 Test Locations Involving Detonation of Explosives)

Table 4.4.2.2.2-1 lists the analytical data tables for the soil sampling performed at SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z. Tables 4.4.2.2.2-2 through 4.4.2.2.2-4 summarize the metals analytical results for all the RFI soil samples collected at SWMUs 58F, 58H, and 58U. Tables 4.4.2.2.2-5 through 4.4.2.2.2-8 provide the analytical results of HE compounds detected at SWMUs 58F, 58J, 58L and 58S. Table 4.4.2.2.2-9 provides the analytical MDLs for SWMUs 58F, 58H, 58J, 58L, and 58S. Table 4.4.2.2.2-10 provides the analytical MDLs for SWMUs 58U, 58X, and 58Z. Because HE compounds were not detected at SWMUs 58H, 58U, 58X, 58Z, no analytical tables are provided for these features. Tables 4.4.2.2.2-11 through 4.4.2.2.2-19 summarize the analytical results for radionuclides (alpha spectroscopy, gamma spectroscopy, and gross alpha/beta activity) for all the surface soil samples collected at SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z. Annex C contains the gamma spectroscopy analysis MDAs used during the RFI at SWMU 58.

To summarize, eleven metals were detected above background levels, five HE compounds were detected, and four radionuclides were detected above the background levels. The analytical results are incorporated into the Risk Assessment for SWMUs 8 and 58 (Annex A).

Metals

Tables 4.4.2.2.2-2 through 4.4.2.2.2-4 summarize the metals analytical results for the soil samples and duplicate samples collected at SWMUs 58F, 58H, and 58U. Because metals were not considered COCs at SWMUs 58J, 58L, 58S, 58X, and 58Z, no metals analysis was performed for these areas.

For the samples collected in 1996 (from SWMUs 58F, 58H, and 58U) and analyzed at ERCL, detections were above the 1998-approved background limits for arsenic, cadmium, copper, mercury, selenium, and silver.

In 1997, six sample locations at SWMUs 58F, 58H, and 58U were resampled. The following detections were reported for the 1996 and 1997 samples:

- One sample collected at SWMU 58H had an arsenic value of 38 J, above the background limit of 9.8 mg/kg.
- Six samples collected at SWMU 58H contained elevated barium concentrations ranging from 249 to 464 mg/kg, compared to a background limit of 246 mg/kg.
- One sample from SWMU 58H and five samples from SWMU 58U contained elevated beryllium levels from 0.815 J to 0.976J mg/kg, compared to a background limit of 0.75 mg/kg.
- One sample from SWMU 58U contained cadmium at a concentration of 1.01 mg/kg, compared to a background limit of 0.64 mg/kg.
- Two samples collected at SWMU 58U contained elevated chromium levels of 18.8 and 19.0 mg/kg, compared to a background limit of 18.8 mg/kg.

Table 4.4.2.2.2-1
List of Tables That Present the Results of RFI Soil Sampling at
Sites Involving Detonation of Explosives,
SWMU 58, Features 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z

Table Number	Title of Table	Feature Sampled
4.4.2.2.2-2	Summary of SWMU, Feature 58F RFI Soil Sampling, Metals Analytical Results, March 1996 and October 1997	58F
4.4.2.2.2-5	Summary of Analytical Detections of HE Compounds in SWMU 58, Feature 58F RFI Soil Samples, September 1998	58F
4.4.2.2.2-9	Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58F, 58H, 58J, 58L, and 58S RFI Soil Sampling, October 1997 and September 1998	58F
4.4.2.2.2-11	Summary of SWMU 58, Feature 58F RFI Soil Sampling, Gamma Spectroscopy Analytical Results, March 1996	58F
4.4.2.2.2-3	Summary of SWMU 58, Feature 58H RFI Soil Sampling, Metals Analytical Results, March 1996 and October 1997	58H
4.4.2.2.2-9	Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58F, 58H, 58J, 58L, and 58S RFI Soil Sampling, October 1997 and September 1998	58H
4.4.2.2.2-12	Summary of SWMU 58, Feature 58H RFI Soil Sampling, Gamma Spectroscopy Analytical Results, March 1996	58H
4.4.2.2.2-6	Summary of Analytical Detections of HE Compounds in SWMU 58, Feature 58J RFI Soil Samples, September 1998	58J
4.4.2.2.2-9	Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58F, 58H, 58J, 58L, and 58S RFI Soil Sampling, October 1997 and September 1998	58J
4.4.2.2.2-13	Summary of SWMU 58, Feature 58J RFI Soil Sampling, Gamma Spectroscopy Analytical Results, September 1998	58J
4.4.2.2.2-7	Summary of Analytical Detections of HE Compounds in SWMU 58, Feature 58L RFI Soil Samples, September 1998	58L
4.4.2.2.2-9	Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58F, 58H, 58J, 58L, and 58S RFI Soil Sampling, October 1997 and September 1998	58L
4.4.2.2.2-14	Summary of SWMU 58, Feature 58L RFI Soil Sampling, Gamma Spectroscopy Analytical Results, September 1998	58L
4.4.2.2.2-8	Summary of Analytical Detections of HE Compounds in SWMU 58, Feature 58S RFI Soil Samples, October 1997	58S
4.4.2.2.2-9	Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58F, 58H, 58J, 58L, and 58S RFI Soil Sampling, October 1997 and September 1998	58S
4.4.2.2.2-15	Summary of SWMU 58, Feature 58S RFI Soil Sampling, Gamma Spectroscopy Analytical Results, October 1997	58S
4.4.2.2.2-4	Summary of SWMU 58, Feature 58U RFI Soil Sampling, Metals Analytical Results, March 1996 and November 1997	58U
4.4.2.2.2-10	Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58U, 58X, and 58Z RFI Soil Sampling, March-May 1996	58U
4.4.2.2.2-16	Summary of SWMU 58, Feature 58U RFI Soil Sampling, Gamma Spectroscopy Analytical Results, March 1996	58U
4.4.2.2.2-19	Summary of SWMU 58, Feature 58U RFI Soil Sampling, Gross Alpha/Gross Beta Analytical Results, November 1997	58U

Refer to footnotes at end of table.

Table 4.4.2.2.2-1 (Concluded)
List of Tables That Present the Results of RFI Soil Sampling at
Sites Involving Detonation of Explosives,
SWMU 58, Features 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z

Table Number	Title of Table	Feature Sampled
4.4.2.2.2-10	Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58U, 58X, and 58Z RFI Soil Sampling, March-May 1996	58X
4.4.2.2.2-17	Summary of SWMU 58, Feature 58X RFI Soil Sampling, Gamma Spectroscopy Analytical Results, May 1996	58X
4.4.2.2.2-10	Summary of HE Compounds Analytical MDLs for SWMU 58, Features 58U, 58X, and 58Z RFI Soil Sampling, March-May 1996	58Z
4.4.2.2.2-18	Summary of SWMU 58, Feature 58Z RFI Soil Sampling, Gamma Spectroscopy Analytical Results, June 1995	58Z

HE = High explosive(s).
MDL = Method detection limit.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-2
Summary of SWMU 58, Feature 58F RFI Soil Sampling, Metals Analytical Results
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
06299	58F-GR-001-0.0-SS	Soil	10-28-97	0–0.5	3.54	115	0.538	ND (0.0104)	10.8	13.3
04942	58F-GR-002-0.0-SS	Soil	03-12-96	0–0.5	**ND (26)**	100	0.36 J	**ND (2.1)**	ND (5)	**ND (20)**
06299	58F-GR-003-0.0-SS	Soil	10-28-97	0–0.5	4.39	126	0.639	ND (0.0104)	13.2	13.6
04923	58F-GR-004-0.0-SS	Soil	03-12-96	0–0.5	3.63	121	0.589	0.515	13.6	16.7
06299	58F-GR-005-0.0-SS	Soil	10-28-97	0–0.5	4.72	135	0.652	ND (0.0104)	12.9	14.6
04942	58F-GR-006-0.0-SS	Soil	03-12-96	0–0.5	**ND (26)**	110	0.43 J (0.44)	**ND (2.1)**	ND (5)	**ND (20)**
06299	58F-GR-007-0.0-SS	Soil	10-28-97	0–0.5	4.10	140	0.641	ND (0.0104)	13.5	16.4
04923	58F-GR-008-0.0-SS	Soil	03-12-96	0–0.5	3.65	105	0.455 J (0.472)	0.204 J (0.472)	16.2	13.6
04942	58F-GR-009-0.0-SS	Soil	03-12-96	0–0.5	**ND (26)**	84	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
04942	58F-GR-010-0.0-SS	Soil	03-12-96	0–0.5	**ND (26)**	100	0.37 J (0.44)	**ND (2.1)**	ND (5)	**ND (20)**
06299	58F-GR-011-0.0-SS	Soil	10-28-97	0–0.5	3.76	115	0.563	ND (0.0104)	10.6	13.5
04923	58F-GR-012-0.0-SS	Soil	03-12-96	0–0.5	4.19	134	0.561	0.212 J (0.495)	11.8	16.1
04942	58F-GR-013-0.0-SS	Soil	03-12-96	0–0.5	**ND (26)**	84	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
04942	58F-GR-014-0.0-SS	Soil	03-12-96	0–0.5	**ND (26)**	95	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
04942	58F-GR-015-0.0-SS	Soil	03-12-96	0–0.5	**ND (26)**	110	0.24 J (0.44)	**ND (2.1)**	ND (5)	**ND (20)**
04923	58F-GR-016-0.0-SS	Soil	03-12-96	0–0.5	3.64	131	0.457 J (0.495)	0.165 J (0.495)	10.3	14.8
04923	58F-GR-016-0.0-SSD	Soil	03-12-96	0–0.5	3.5	151	0.436 J (0.481)	0.160 J (0.481)	12.9	13.9
06299	58F-GR-017-0.0-SS	Soil	10-28-97	0–0.5	3.93	116	0.524	ND (0.0104)	12.3	14.2
06299	58F-GR-018-0.0-SSD[c]	Soil	10-28-97	0–0.5	2.93	101	0.486	ND (0.0104)	10.9	12.0
NMED-Approved Background Values—Canyons Area[d]		Soil	NA	NA	9.8	246	0.75	0.64[a]	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
06299	58F-GR-019-FB	Water	10-28-97	NA	0.00317 J (0.00500)	ND (0.000332)	ND (0.000223)	0.000239 J (0.00500)	ND (0.000729)	ND (0.00132)
06299	58-GR-020-EB	Water	10-28-97	NA	ND (0.00293)	ND (0.000332)	ND (0.000223)	ND (0.000208)	ND (0.000729)	ND (0.00132)
04942	58F-GR-018-0.0-EB	Water	03-12-96	NA	ND (0.15)	ND (0.10)	ND (0.001)	ND (0.015)	ND (0.025)	ND (0.20)
04923	58-GR-018-0.0-EB	Water	03-12-96	NA	0.00389 J (0.01)	0.000405 J (0.01)	ND (0.0000114)	ND (0.000097)	ND (0.00596)	0.00114 J (0.01)

Refer to footnotes at end of table.

Table 4.4.2.2.2-2 (Continued)
Summary of SWMU 58, Feature 58F RFI Soil Sampling, Metals Analytical Results
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
06299	58F-GR-001-0.0-SS	Soil	10-28-97	0–0.5	9.15	0.0517	9.78	ND (0.07)	0.381 J (0.467)	39.7
04942	58F-GR-002-0.0-SS	Soil	03-12-96	0–0.5	9.1 J (13)	**0.083 J (0.24)**	ND (4)	**ND (50)**	**ND (1.7)**	29 J (38)
06299	58F-GR-003-0.0-SS	Soil	10-28-97	0–0.5	9.21	0.0230 J (0.0317)	11.0	ND (0.07)	0.319 J (0.495)	40.6
04923	58F-GR-004-0.0-SS	Soil	03-12-96	0–0.5	13	ND (0.00238)	10.1	0.712	**0.591 J (0.98)**	**53.9**
06299	58F-GR-005-0.0-SS	Soil	10-28-97	0–0.5	9.12	0.0257 J (0.0290)	11.1	ND (0.07)	0.306 J (0.476)	43.1
04942	58F-GR-006-0.0-SS	Soil	03-12-96	0–0.5	9.4 J (13)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	22 J (38)
06299	58F-GR-007-0.0-SS	Soil	10-28-97	0–0.5	9.72	0.0339	11.2	0.175 J (0.495)	0.357 J (0.495)	49
04923	58F-GR-008-0.0-SS	Soil	03-12-96	0–0.5	8.55	0.00864 J (0.0326)	9.97	0.575	ND (0.235)	38.2
04942	58F-GR-009-0.0-SS	Soil	03-12-96	0–0.5	11 J (13)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	17 J (38)
04942	58F-GR-010-0.0-SS	Soil	03-12-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	20 J (38)
06299	58F-GR-011-0.0-SS	Soil	10-28-97	0–0.5	9.10	0.0441	10.2	ND (0.07)	0.291 J (0.485)	38.3
04923	58F-GR-012-0.0-SS	Soil	03-12-96	0–0.5	10	0.0115 J (0.0332)	11.3	0.418 J (0.495)	ND (0.247)	42.7
04942	58F-GR-013-0.0-SS	Soil	03-12-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	12 J (38)
04942	58F-GR-014-0.0-SS	Soil	03-12-96	0–0.5	3.8 J (13)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	12 J (38)
04942	58F-GR-015-0.0-SS	Soil	03-12-96	0–0.5	9.9 J (13)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	17 J (38)
04923	58F-GR-016-0.0-SS	Soil	03-12-96	0–0.5	8.09	**0.155 J**	9.64	0.476 J (0.495)	ND (0.247)	35.1
04923	58F-GR-016-0.0-SSD	Soil	03-12-96	0–0.5	8.12	0.0108 J (0.0308)	10.5	0.646	ND (0.240)	36
06299	58F-GR-017-0.0-SS	Soil	10-28-97	0–0.5	8.57	0.0360	10.8	ND (0.07)	0.300 J (0.485)	41.1
NMED-Approved Background Values—Canyons Area[d]		Soil	NA	NA	18.9	0.055	16.6	2.7	0.5	52.1

Refer to footnotes at end of table.

Table 4.4.2.2.2-2 (Concluded)
Summary of SWMU 58, Feature 58F RFI Soil Sampling, Metals Analytical Results
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
06299	58F-GR-018-0.0-SSD[c]	Soil	10-28-97	0–0.5	8.34	ND (0.0173)	8.82	ND (0.07)	0.377 J (0.485)	36.8
NMED-Approved Background Values—Canyons Area[d]		Soil	NA	NA	18.9	0.055	16.6	2.7	0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)										
06299	58F-GR-019-FB	Water	10-28-97	NA	ND (0.000678)	0.000116 J (0.000200)	ND (0.00227)	ND (0.0014)	ND (0.00062)	0.00317 J (0.00500)
06299	58-GR-020-EB	Water	10-28-97	NA	ND (0.000678)	0.000162 J (0.000200)	ND (0.00227)	ND (0.0014)	ND (0.00062)	0.00293 J (0.00500)
04942	58F-GR-018-0.0-EB	Water	03-12-96	NA	ND (0.02)	ND (0.0020)	ND (0.040)	ND (0.50)	ND (0.01)	ND (0.10)
04923	58-GR-018-0.0-EB	Water	03-12-96	NA	ND (0.00113)	0.000105 J (0.0002)	ND (0.000807)	ND (0.00143)	ND (0.00249)	0.00493 J (0.02)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]58F-GR-018-0.0-SSD is a duplicate of 58F-GR-001-0.0-SS.
[d]Garcia November 1998.

58F = SWMU 58, Feature F.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface Soil Sample.
SWMU = Solid Waste Management Unit.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-3
Summary of SWMU 58, Feature 58H RFI Soil Sampling, Metals Analytical Results
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)		
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium
510043	58H-GR-001-0.0-SS	Soil	10-28-97	0–0.5	2.38	112	0.474 J (0.485)
510043	58H-GR-002-0.0-SS	Soil	10-28-97	0–0.5	3.54	123	0.553
04947	58H-GR-003-0.0-SS	Soil	03-13-96	0–0.5	**ND (26)**	200	0.24 J (0.44)
04924	58H-GR-004-0.0-SS	Soil	03-13-96	0–0.5	4.74	146	0.607
510043	58H-GR-005-0.0-SS	Soil	10-28-97	0–0.5	3.24	218	0.422 J (0.476)
04947	58H-GR-006-0.0-SS	Soil	03-13-96	0–0.5	**ND (26)**	240	0.12 J (0.44)
04947	58H-GR-007-0.0-SS	Soil	03-13-96	0–0.5	**ND (26)**	**290**	ND (0.11)
04924	58H-GR-008-0.0-SS	Soil	03-13-96	0–0.5	3.93	158	0.519
510043	58H-GR-009-0.0-SS	Soil	10-28-97	0–0.5	3.22	**426**	0.336 J (0.490)
04947	58H-GR-010-0.0-SS	Soil	03-13-96	0–0.5	**ND (26)**	220	0.2 J (0.44)
510043	58H-GR-011-0.0-SS	Soil	10-28-97	0–0.5	3.40	**345**	0.373 J (0.500)
04924	58H-GR-012-0.0-SS	Soil	03-13-96	0–0.5	3.94	**464**	0.275 J (0.5)
510043	58H-GR-013-0.0-SS	Soil	10-28-97	0–0.5	5.48	170	**0.937**
04947	58H-GR-014-0.0-SS	Soil	03-13-96	0–0.5	**38 J (98)**	95	0.15 J (0.44)
04947	58H-GR-015-0.0-SS	Soil	03-13-96	0–0.5	**ND (26)**	110	0.4 J (0.44)
04924	58H-GR-016-0.0-SS	Soil	03-13-96	0–0.5	3.91	**312**	0.491
04924	58H-GR-016-0.0-SSD	Soil	03-13-96	0–0.5	3.8	**249**	0.488
04947	58H-GR-017-0.0-SS	Soil	03-13-96	0–0.5	**ND (26)**	230	0.13 J (0.44)
510043	58H-GR-018-0.0-SD[c]	Soil	10-28-97	0–0.5	2.94	111	0.518
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	9.8	246	0.75
Quality Assurance/Quality Control Samples (mg/L)							
04924	58H-GR-018-0.0-EB	Water	03-13-96	NA	0.00363 J (0.01)	0.00062 J (0.01)	0.0000327 J (0.005)
04947	58H-GR-018-0.0-EB	Water	03-13-96	NA	ND (0.15)	ND (0.10)	ND (0.001)

Refer to footnotes at end of table.

Table 4.4.2.2.2-3 (Continued)
Summary of SWMU 58, Feature 58H RFI Soil Sampling, Metals Analytical Results
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)		
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Cadmium	Chromium	Copper
510043	58H-GR-001-0.0-SS	Soil	10-28-97	0–0.5	ND (0.0104)	7.76	11.3
510043	58H-GR-002-0.0-SS	Soil	10-28-97	0–0.5	ND (0.0104)	9.67	9.98
04947	58H-GR-003-0.0-SS	Soil	03-13-96	0–0.5	**ND (2.1)**	ND (5)	**ND (20)**
04924	58H-GR-004-0.0-SS	Soil	03-13-96	0–0.5	0.228 J (0.485)	12.3	13.1
510043	58H-GR-005-0.0-SS	Soil	10-28-97	0–0.5	ND (0.0104)	7.91	8.86
04947	58H-GR-006-0.0-SS	Soil	03-13-96	0–0.5	**ND (2.1)**	ND (5)	**ND (20)**
04947	58H-GR-007-0.0-SS	Soil	03-13-96	0–0.5	**ND (2.1)**	ND (5)	**ND (20)**
04924	58H-GR-008-0.0-SS	Soil	03-13-96	0–0.5	0.230 J (0.476)	9.09	15.3
510043	58H-GR-009-0.0-SS	Soil	10-28-97	0–0.5	ND (0.0104)	6.88	6.23
04947	58H-GR-010-0.0-SS	Soil	03-13-96	0–0.5	**ND (2.1)**	ND (5)	**ND (20)**
510043	58H-GR-011-0.0-SS	Soil	10-28-97	0–0.5	ND (0.0104)	6.54	5.83
04924	58H-GR-012-0.0-SS	Soil	03-13-96	0–0.5	0.133 J (0.5)	5.53	7.98
510043	58H-GR-013-0.0-SS	Soil	10-28-97	0–0.5	ND (0.0104)	16.3	15.5
04947	58H-GR-014-0.0-SS	Soil	03-13-96	0–0.5	**ND (2.1)**	ND (5)	**ND (20)**
04947	58H-GR-015-0.0-SS	Soil	03-13-96	0–0.5	**ND (2.1)**	ND (5)	**ND (20)**
04924	58H-GR-016-0.0-SS	Soil	03-13-96	0–0.5	0.180 J (0.49)	9.28	10.8
04924	58H-GR-016-0.0-SSD	Soil	03-13-96	0–0.5	0.176 J (0.485)	9.86	10.9
04947	58H-GR-017-0.0-SS	Soil	03-13-96	0–0.5	**ND (2.1)**	ND (5)	**ND (20)**
510043	58H-GR-018-0.0-SD[c]	Soil	10-28-97	0–0.5	ND (0.0104)	10.9	12.6
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	0.64	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)							
04924	58H-GR-018-0.0-EB	water	03-13-96	NA	ND (0.000097 J)	0.00206 J (0.01)	0.00333 J (0.01)
04947	58H-GR-018-0.0-EB	Water	03-13-96	NA	ND (0.015)	ND (0.025)	ND (0.20)

Refer to footnotes at end of table.

Table 4.4.2.2.2-3 (Continued)
Summary of SWMU 58, Feature 58H RFI Soil Sampling, Metals Analytical Results
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)		
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel
510043	58H-GR-001-0.0-SS	Soil	10-28-97	0–0.5	**44.8**	0.0527	8.72
510043	58H-GR-002-0.0-SS	Soil	10-28-97	0–0.5	9.85	0.0483	9.85
04947	58H-GR-003-0.0-SS	Soil	03-13-96	0–0.5	**26**	**ND (0.06)**	ND (4.0)
04924	58H-GR-004-0.0-SS	Soil	03-13-96	0–0.5	11.2B	**ND (0.06)**	10.9
510043	58H-GR-005-0.0-SS	Soil	10-28-97	0–0.5	12.0	0.0346	8.28
04947	58H-GR-006-0.0-SS	Soil	03-13-96	0–0.5	15	**ND (0.06)**	ND (4.0)
04947	58H-GR-007-0.0-SS	Soil	03-13-96	0–0.5	7.2 J (13)	**ND (0.06)**	ND (4.0)
04924	58H-GR-008-0.0-SS	Soil	03-13-96	0–0.5	**19**	0.0164 J (0.0298)	9.64
510043	58H-GR-009-0.0-SS	Soil	10-28-97	0–0.5	5.21	0.0269 J (0.0324)	6.95
04947	58H-GR-010-0.0-SS	Soil	03-13-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4.0)
510043	58H-GR-011-0.0-SS	Soil	10-28-97	0–0.5	5.58	0.0378	7.68
04924	58H-GR-012-0.0-SS	Soil	03-13-96	0–0.5	5.02	0.0231 J (0.0298)	7.03
510043	58H-GR-013-0.0-SS	Soil	10-28-97	0–0.5	11.0	0.0387	14.2
04947	58H-GR-014-0.0-SS	Soil	03-13-96	0–0.5	6.5 (13)	**ND (0.06)**	ND (4.0)
04947	58H-GR-015-0.0-SS	Soil	03-13-96	0–0.5	4.6 J (13)	**ND (0.06)**	ND (4.0)
04924	58H-GR-016-0.0-SS	Soil	03-13-96	0–0.5	7.99	0.0141 J (0.03)	9.43
04924	58H-GR-016-0.0-SSD	Soil	03-13-96	0–0.5	9.33	0.0162 J (0.0324)	9.33
04947	58H-GR-017-0.0-SS	Soil	03-13-96	0–0.5	**23**	**ND (0.06)**	ND (4.0)
510043	58H-GR-018-0.0-SD[c]	Soil	10-28-97	0–0.5	**33.5**	0.0364	9.63
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	18.9	0.055	16.6
Quality Assurance/Quality Control Samples (mg/L)							
04924	58H-GR-018-0.0-EB	Water	03-13-96	NA	0.00130 J (0.003)	ND (0.0148)	ND (0.000807)
04947	58H-GR-018-0.0-EB	Water	03-13-96	NA	ND (0.02)		ND (0.040)

Refer to footnotes at end of table.

Table 4.4.2.2.2-3 (Continued)
Summary of SWMU 58, Feature 58H RFI Soil Sampling, Metals Analytical Results
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)		
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Selenium	Silver	Zinc
510043	58H-GR-001-0.0-SS	Soil	10-28-97	0–0.5	ND (0.07)	0.361 J (0.485)	34.6
510043	58H-GR-002-0.0-SS	Soil	10-28-97	0–0.5	ND (0.07)	0.284 J (0.485)	31.6
04947	58H-GR-003-0.0-SS	Soil	03-13-96	0–0.5	**ND (50)**	**ND (1.7)**	21 J (38)
04924	58H-GR-004-0.0-SS	Soil	03-13-96	0–0.5	0.217 J (0.485)	ND (0.242)	36.9 J
510043	58H-GR-005-0.0-SS	Soil	10-28-97	0–0.5	ND (0.07)	0.281 J (0.476)	12 J
04947	58H-GR-006-0.0-SS	Soil	03-13-96	0–0.5	**ND (50)**	**ND (1.7)**	11 J (38)
04947	58H-GR-007-0.0-SS	Soil	03-13-96	0–0.5	**59 J (191)**	**ND (1.7)**	ND (10)
04924	58H-GR-008-0.0-SS	Soil	03-13-96	0–0.5	0.339 J (0.476)	ND (0.237)	29.7 J
510043	58H-GR-009-0.0-SS	Soil	10-28-97	0–0.5	ND (0.07)	0.281 J (0.490)	19.5
04947	58H-GR-010-0.0-SS	Soil	03-13-96	0–0.5	**ND (50)**	**ND (1.7)**	11 J (38)
510043	58H-GR-011-0.0-SS	Soil	10-28-97	0–0.5	ND (0.07)	0.319 J (0.500)	20.3
04924	58H-GR-012-0.0-SS	Soil	03-13-96	0–0.5	0.387 J (0.5)	ND (0.249)	10.9 J
510043	58H-GR-013-0.0-SS	Soil	10-28-97	0–0.5	0.165 J (0.495)	0.313 J (0.495)	48.6
04947	58H-GR-014-0.0-SS	Soil	03-13-96	0–0.5	**ND (50)**	**ND (1.7)**	11 J (38)
04947	58H-GR-015-0.0-SS	Soil	03-13-96	0–0.5	**ND (50)**	**ND (1.7)**	14 J (38)
04924	58H-GR-016-0.0-SS	Soil	03-13-96	0–0.5	0.322 J (0.49)	ND (0.244)	26.7 J
04924	58H-GR-016-0.0-SSD	Soil	03-13-96	0–0.5	ND (0.139)	ND (0.242)	27.9 J
04947	58H-GR-017-0.0-SS	Soil	03-13-96	0–0.5	**ND (50)**	**ND (1.7)**	13 J (38)
510043	58H-GR-018-0.0-SD[c]	Soil	10-28-97	0–0.5	ND (0.07)	0.297 J (0.472)	39.5
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	2.7	<0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)							
04924	58H-GR-018-0.0-EB	Water	03-13-96	NA	ND (0.00143)	ND (0.00249)	0.148
04947	58H-GR-018-0.0-EB	Water	03-13-96	NA	ND (0.50)	ND (0.01)	ND (0.10)

Refer to footnotes at end of table.

Table 4.4.2.2.2-3 (Concluded)
Summary of SWMU 58, Feature 58H RFI Soil Sampling, Metals Analytical Results
March 1996 and October 1997
(On- and Off-Site Laboratories)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]58F-GR-018-0.0-SD is a duplicate of 58-GR-001-0.0-SS.
[d]Garcia November 1998.

58H = SWMU 58, Feature H.
B = Analyte detected in associated blank.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SD = Soil sample duplicate.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-4
Summary of SWMU 58, Feature 58U RFI Soil Sampling, Metals Analytical Results
March 1996 and November 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
04953	58DRT-GR-001-0.0-SS	Soil	03-14-96	0–0.5	**ND (26)**	66	0.11 J (0.44)	**ND (2.1)**	ND (5)	**ND (20)**
510045	58DRT-GR-002-0.0-SS	Soil	11-06-97	0–0.5	3.28	186	0.582	ND (0.0104)	13.3	**17.6**
510045	58DRT-GR-002-0.0-SSD	Soil	11-06-97	0–0.5	3.20	102	0.477 J (0.495)	ND (0.0104)	9.92	16.0
04953	58DRT-GR-003-0.0-SS	Soil	03-14-96	0–0.5	**ND (26)**	92	0.13 J (0.44)	**ND (2.1)**	ND (5)	**ND (20)**
04956	58DRT-GR-004-0.0-SS	Soil	03-14-96	0–0.5	4.86	164	**0.815 J**	0.478 J (0.49)	18.5	**24.5**
04953	58DRT-GR-005-0.0-SS	Soil	03-14-96	0–0.5	**ND (26)**	83	0.15 J (0.44)	**ND (2.1)**	ND (5)	**ND (20)**
510045	58DRT-GR-006-0.0-SS	Soil	11-06-97	0–0.5	3.19	109	0.545	ND (0.0104)	11.5	15.4
510045	58DRT-GR-007-0.0-SS	Soil	11-06-97	0–0.5	3.56	133	0.603	ND (0.0104)	11.1	16.4
04956	58DRT-GR-008-0.0-SS	Soil	03-14-96	0–0.5	5.61	209	**0.919 J**	0.403 J (0.472)	**18.8**	**25.1**
510045	58DRT-GR-009-0.0-SS	Soil	11-06-97	0–0.5	5.06	193	**0.976 J**	ND (0.0104)	**19.0**	**27.2**
510045	58DRT-GR-010-0.0-SS	Soil	11-06-97	0–0.5	4.01	165	0.731	0.108 J (0.500)	11.1	**23.1**
04953	58DRT-GR-011-0.0-SS	Soil	03-14-96	0–0.5	**ND (26)**	150	0.5	**ND (2.1)**	13 J (19)	**29 J (76)**
04956	58DRT-GR-012-0.0-SS	Soil	03-14-96	0–0.5	3.39	101	0.483 J (0.49)	0.233 J (0.49)	13.9	15.4
04953	58DRT-GR-013-0.0-SS	Soil	03-14-96	0–0.5	**ND (26)**	70	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
04953	58DRT-GR-014-0.0-SS	Soil	03-14-96	0–0.5	**ND (26)**	69	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
510045	58DRT-GR-015-0.0-SS	Soil	11-06-97	0–0.5	2.23	69.9	0.331 J (0.490)	ND (0.0104)	8.08	11.4
04956	58DRT-GR-016-0.0-SS	Soil	03-14-96	0–0.5	5.24	181	**0.834 J**	0.529	16.7	**25.5**
04956	58DRT-GR-016-0.0-SSD	Soil	03-14-96	0–0.5	5.09	174	**0.836 J**	**1.01**	17.6	**25**
510045	58DRT-GR-017-0.0-SS	Soil	11-06-97	0–0.5	2.43	116	0.454 J (0.485)	0.0971 J (0.485)	6.78	15.6
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64[a]	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
04953	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	ND (0.15)	ND (0.10)	ND (0.001)	ND (0.015)	ND (0.025)	ND (0.20)
04956	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	0.00606 J (0.01)	0.000376 J (0.01)	0.0000153 J (0.005)	ND (0.0000970)	ND (0.000539)	0.00158 J (0.01)

Refer to footnotes at end of table.

Table 4.4.2.2.2-4 (Continued)
Summary of SWMU 58, Feature 58U RFI Soil Sampling, Metals Analytical Results
March 1996 and November 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
04953	58DRT-GR-001-0.0-SS	Soil	03-14-96	0–0.5	7.8 J (13)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	21 J (38)
510045	58DRT-GR-002-0.0-SS	Soil	11-06-97	0–0.5	18.7	0.0263 J (0.0295)	10.2	ND (0.07)	0.104 J (0.485)	42.6
510045	58DRT-GR-002-0.0-SSD	Soil	11-06-97	0–0.5	18.1	0.052 J (0.0332)	9.01	0.142 J (0.495)	0.224 J (0.495)	36.3
04953	58DRT-GR-003-0.0-SS	Soil	03-14-96	0–0.5	11 J (13)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	16 J (38)
04956	58DRT-GR-004-0.0-SS	Soil	03-14-96	0–0.5	**29.4**	**0.585**	14.9	0.923 J	ND (0.244)	**60.4**
04953	58DRT-GR-005-0.0-SS	Soil	03-14-96	0–0.5	15	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	20 J (38)
510045	58DRT-GR-006-0.0-SS	Soil	11-06-97	0–0.5	13	0.0321 J (0.0329)	9.45	0.165 J (0.472)	0.0798 J (0.472)	37.5
510045	58DRT-GR-007-0.0-SS	Soil	11-06-97	0–0.5	16.3	0.0235 J (0.0305)	10.2	ND (0.07)	0.0883 J (0.495)	40.1
04956	58DRT-GR-008-0.0-SS	Soil	03-14-96	0–0.5	**23.4**	0.0516	15.8	0.682 J	ND (0.235)	**61.5**
510045	58DRT-GR-009-0.0-SS	Soil	11-06-97	0–0.5	**22.9**	0.0497	15.6	ND (0.07)	0.278 J (0.476)	**67.3**
510045	58DRT-GR-010-0.0-SS	Soil	11-06-97	0–0.5	**23.7**	0.0470	12.8	ND (0.07)	0.490 J (0.500)	**53.4**
04953	58DRT-GR-011-0.0-SS	Soil	03-14-96	0–0.5	**27**	**0.56**	ND (4)	**ND (50)**	**2.1 J (6.4)**	**85**
04956	58DRT-GR-012-0.0-SS	Soil	03-14-96	0–0.5	10.1 (0.98)	0.0186 J (0.0302)	10.1	0.389 J (0.49)	ND (0.244)	37.9
04953	58DRT-GR-013-0.0-SS	Soil	03-14-96	0–0.5	4.2 J (13)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	14 J (38)
04953	58DRT-GR-014-0.0-SS	Soil	03-14-96	0–0.5	4.4 J (13)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	23 J (38)
510045	58DRT-GR-015-0.0-SS	Soil	11-06-97	0–0.5	7.73	0.0213 J (0.0315)	7.3	ND (0.07)	0.152 J (0.490)	30.9
04956	58DRT-GR-016-0.0-SS	Soil	03-14-96	0–0.5	**47.5**	0.0280 J	15.3	**8.04 J**	ND (0.242)	**59.6**
04956	58DRT-GR-016-0.0-SSD	Soil	03-14-96	0–0.5	**24**	0.0325 J (0.0332)	15.1	0.75 J	ND (0.244)	**63.7**
510045	58DRT-GR-017-0.0-SS	Soil	11-06-97	0–0.5	13.9	**0.0764**	8.52	0.306 J (0.485)	0.187 J (0.485)	32.9
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1
Quality Assurance/Quality Control Samples (mg/L)										
04953	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	ND (0.02)	ND (0.0020)	ND (0.040)	ND (0.01)	ND (0.50)	ND (0.10)
04956	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	0.00143 J (0.003)	ND (0.0148)	ND (1.9)	ND (0.00249)	ND (0.00143)	0.00330 J (0.02)

Refer to footnotes at end of table.

Table 4.4.2.2.2-4 (Concluded)
Summary of SWMU 58, Feature 58U RFI Soil Sampling, Metals Analytical Results
March 1996 and November 1997
(On- and Off-Site Laboratories)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

58DRT	= 58 Doppler Radar Test (Feature 58U).
EB	= Equipment blank.
EPA	= U.S. Environmental Protection Agency.
ER	= Environmental Restoration.
FB	= Field blank.
ft	= Foot (feet).
GR	= Grab sample.
ID	= Identification.
J ( )	= The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL	= Method detection limit.
mg/kg	= Milligram(s) per kilogram.
mg/L	= Milligram(s) per liter.
NA	= Not applicable.
ND ( )	= Not detected above the MDL, shown in parentheses.
NMED	= New Mexico Environment Department.
RCRA	= Resource Conservation and Recovery Act.
RFI	= RCRA Facility Investigation.
SS	= Surface Soil Sample.
SSD	= Soil sample duplicate.
SWMU	= Solid Waste Management Unit.

Table 4.4.2.2.2-5
Summary of Analytical Detections of HE Compounds in
SWMU 58, Feature 58F RFI Soil Samples
September 1998
(Off-Site Laboratory)

Sample Attributes					HE Residues (EPA Method 8330[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	HMX	m-Dinitrobenzene
600803	S58F-GR-101-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-102-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-103-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-104-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-105-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-106-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-107-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-108-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-109-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-110-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-111-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	**130 J**
600803	S58F-GR-112-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-113-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-114-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-115-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (4.1 J)
600803	S58F-GR-116-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	**90 J**
600803	S58F-GR-117-0-SS	Soil	09-08-98	0–0.5	**450**	ND (4.1 J)
600803	S58F-GR-156-0-SD[c]	Soil	09-08-98	0–0.5	ND (5.3 J)	**150 J**
Quality Assurance/Quality Control Samples (μg/L)						
600803	S58F-GR-153-0-EB	Water	09-08-98	NA	ND (0.046)	ND (0.02)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]S58F-GR-156-0-SD is a duplicate of S58F-GR-110-0-SS.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58F = SWMU 58, Feature F.
SS = Surface soil sample.
SD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-6
Summary of Analytical Detections of HE Compounds in
SWMU 58, Feature 58J RFI Soil Samples
September 1998
(Off-Site Laboratory)

Sample Attributes					HE Residues (EPA Method 8330[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	2-amino-4,6-Dinitrotoluene	2,4,6-Trinitrotoluene
600803	S58J-GR-137-0-SS	Soil	09-08-98	0–0.5	ND (6.6 J)	ND (5.7 J)
600803	S58J-GR-138-0-SS	Soil	09-08-98	0–0.5	ND (6.6 J)	ND (5.7 J)
600803	S58J-GR-139-0-SS	Soil	09-08-98	0–0.5	ND (6.6 J)	ND (5.7 J)
600803	S58J-GR-140-0-SS	Soil	09-08-98	0–0.5	ND (6.6 J)	ND (5.7 J)
600803	S58J-GR-141-0-SS	Soil	09-08-98	0–0.5	ND (6.6 J)	ND (5.7 J)
600803	S58J-GR-142-0-SS	Soil	09-08-98	0–0.5	ND (6.6 J)	ND (5.7 J)
600803	S58J-GR-143-0-SS	Soil	09-08-98	0–0.5	ND (6.6 J)	ND (5.7 J)
600803	S58J-GR-158-0-SD[c]	Soil	09-08-98	0–0.5	**110 J**	ND (5.7 J)
600803	S58J-GR-135-0-SS	Soil	09-08-98	0–0.5	**130 J**	**150 J**
600803	S58J-GR-136-0-SS	Soil	09-08-98	0–0.5	ND (6.6 J)	ND (5.7 J)
Quality Assurance/Quality Control Samples (μg/L)						
600803	S58JL-GR-155-0-EB	Water	09-08-98	NA	ND (0.019)	ND (0.029)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]S58J-GR-158-0-SD is a duplicate of S58J-140-0-SS.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
ID = Identification.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58J = SWMU 58, Feature J.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-7
Summary of Analytical Detections of HE Compounds in
SWMU 58, Feature 58L RFI Soil Samples
September 1998
(Off-Site Laboratory)

Sample Attributes					HE Residues (EPA Method 8330[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	HMX	2,4,6-Trinitrotoluene
600803	S58L-GR-144-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (5.7 J)
600803	S58L-GR-145-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (5.7 J)
600803	S58L-GR-146-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (5.7 J)
600803	S58L-GR-147-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (5.7 J)
600803	S58L-GR-148-0-SS	Soil	09-08-98	0–0.5	**520 J**	ND (5.7 J)
600803	S58L-GR-149-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (5.7 J)
600803	S58L-GR-150-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (5.7 J)
600803	S58L-GR-151-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	**310 J**
600803	S58L-GR-152-0-SS	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (5.7 J)
600803	S58L-GR-159-0-SD	Soil	09-08-98	0–0.5	ND (5.3 J)	ND (5.7 J)
Quality Assurance/Quality Control Samples (μg/L)						
600803	S58JL-GR-155-0-EB	Water	09-08-98	NA	ND (0.046)	ND (0.029)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]S58L-GR-159-0-SD is a duplicate of S58L-GR-150-0-SS.
EB = Equipment rinsate blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58L = SWMU 58, Feature L.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-8
Summary of Analytical Detections of HE Compounds in
SWMU 58, Feature 58S RFI Soil Samples
October 1997
(Off-Site Laboratory)

Sample Attributes					HE Residues (EPA Method 8330[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	4-amino-2,6-Dinitrotoluene	2,4,6-Trinitrotoluene
06296	1332-58S-001-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-002-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-003-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-004-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-005-0.5-SS	Soil	10-16-97	0–0.5	**680**	**6,300**
06296	1332-58S-006-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-007-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-008-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-009-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-010-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-011-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-012-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-013-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-014-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-015-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-016-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-017-0.5-SS	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
06296	1332-58S-018-0.5-SD[c]	Soil	10-16-97	0–0.5	ND (5.45)	ND (5.67)
Quality Assurance Samples (μg/L)						
06296	1332-58S-019-FB	Water	10-16-97	NA	ND (0.0195)	ND (0.0293)
06296	1332-58S-020-EB	Water	10-16-97	NA	ND (0.0195)	ND (0.0293)

Note: Values in **bold** represent detected analytes. (Number in parentheses is the method detection limit for that parameter.)

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]1332-58S-018-0.5-SD is a duplicate of 1332-58S-008-0.5-SS.

58S = SWMU 58, Feature S.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
HE = High explosive(s).
ID = Identification.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-9
Summary of HE Compounds Analytical MDLs for
SWMU 58, Features 58F, 58H, 58J, 58L, and 58S RFI Soil Sampling
October 1997 and September 1998
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
m-Dinitrobenzene	4.1
2,4-Dinitrotoluene	6.2
2,6-Dinitrotoluene	6.5
2-amino-4,6-Dinitrotoluene	6.6
4-amino-2,6-Dinitrotoluene	5.5
HMX	5.3
Nitrobenzene	5.2
m-Nitrotoluene	11
o-Nitrotoluene	7.8
p-Nitrotoluene	11
RDX	9.7
Tetryl	7.5
sym-Trinitrobenzene	6.6
2,4,6-Trinitrotoluene	5.7

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.2.2-10
Summary of HE Compounds Analytical MDLs for
SWMU 58, Features 58U, 58X, and 58Z RFI Soil Sampling
March–May 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
m-Dinitrobenzene	80
2,4-Dinitrotoluene	80
2,6-Dinitrotoluene	80
2-amino-4,6-Dinitrotoluene	80
4-amino-4,6-Dinitrotoluene	80
HMX	240
Nitrobenzene	80
m-Nitrotoluene	80
o-Nitrotoluene	80
p-Nitrotoluene	80
RDX	240
Tetryl	160
sym-Trinitrobenzene	80
2,4,6-Trinitrotoluene	80

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.2.2-11
Summary of SWMU 58, Feature 58F RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
04944	58F-GR-001-0.0-SS	Soil	03-12-96	0–0.5	0.0625	0.0221	0.838	0.397
04944	58F-GR-002-0.0-SS	Soil	03-12-96	0–0.5	0.174	0.0349	0.837	0.407
04944	58F-GR-003-0.0-SS	Soil	03-12-96	0–0.5	0.0438	0.0265	0.849	0.403
04941	58F-GR-004-0.0-SS	Soil	03-12-96	0–0.5	0.285	0.0464	0.712	0.338
04923[d]	58F-GR-004-0.0-SSO	Soil	03-12-96	0–0.5	0.421	0.0457	ND (0.939)	--
04944	58F-GR-005-0.0-SS	Soil	03-12-96	0–0.5	0.0186	0.0219	0.744	0.357
04944	58F-GR-006-0.0-SS	Soil	03-12-96	0–0.5	0.0203	0.0190	0.832	0.389
04944	58F-GR-007-0.0-SS	Soil	03-12-96	0–0.5	0.0627	0.0220	0.720	0.357
04941	58F-GR-008-0.0-SS	Soil	03-12-96	0–0.5	0.0605	0.0211	0.750	0.364
04923[d]	58F-GR-008-0.0-SSO	Soil	03-12-96	0–0.5	0.0834	0.0270	ND (0.943)	--
04944	58F-GR-009-0.0-SS	Soil	03-12-96	0–0.5	0.0624	0.0211	0.751	0.366
04944	58F-GR-010-0.0-SS	Soil	03-12-96	0–0.5	0.0338	0.0197	0.902	0.424
04944	58F-GR-011-0.0-SS	Soil	03-12-96	0–0.5	ND (0.0361)	--	0.856	0.405
04941	58F-GR-012-0.0-SS	Soil	03-12-96	0–0.5	0.0422	0.0163	0.785	0.371
04923[d]	58F-GR-012-0.0-SSO	Soil	03-12-96	0–0.5	0.0534	0.0433	ND (1.00)	--
04944	58F-GR-013-0.0-SS	Soil	03-12-96	0–0.5	0.0520	0.0251	0.809	0.383
04944	58F-GR-014-0.0-SS	Soil	03-12-96	0–0.5	0.0525	0.0272	0.725	0.338
04944	58F-GR-015-0.0-SS	Soil	03-12-96	0–0.5	0.0337	0.0188	0.841	0.404
04941	58F-GR-016-0.0-SS	Soil	03-12-96	0–0.5	0.0578	0.0188	0.799	0.392
04944	58F-GR-016-0.0-SSD	Soil	03-12-96	0–0.5	0.0403	0.0186	0.794	0.385
04923[d]	58F-GR-016-0.0-SSO	Soil	03-12-96	0–0.5	0.114	0.0305	ND (0.960)	--
04923[d]	58F-GR-016-0.0-SSOD	Soil	03-12-96	0–0.5	0.0917	0.0274	ND (0.939)	--
04944	58F-GR-017-0.0-SS	Soil	03-12-96	0–0.5	0.0726	0.0256	0.786	0.364
Background Activities—Lower Canyons Area[e]		NA	NA	NA	1.55	NA	1.03	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
04944	58F-GR-018-0.0-EB	Water	03-12-96	NA	ND (0.0150)	NA	ND (0.0916)	NA
04923	58F-GR-018-0.0-EB	Water	03-12-96	NA	ND (3.61)	NA	ND (1.75)	NA

Refer to footnotes at end of table.

Table 4.4.2.2.2-11 (Continued)
Summary of SWMU 58, Feature 58F RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
04944	58F-GR-001-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.182)**	--	ND (1.34)	--
04944	58F-GR-002-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.173)**	--	ND (1.30)	--
04944	58F-GR-003-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.175)**	--	ND (1.28)	--
04941	58F-GR-004-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.229)**	--	**ND (3.27)**	--
04923[d]	58F-GR-004-0.0-SSO	Soil	03-12-96	0–0.5	ND (0.137)	--	ND (1.76)	--
04944	58F-GR-005-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.181)**	--	ND (1.35)	--
04944	58F-GR-006-0.0-SS	Soil	03-12-96	0–0.5	0.110	0.123	ND (1.32)	--
04944	58F-GR-007-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.167)**	--	ND (1.24)	--
04941	58F-GR-008-0.0-SS	Soil	03-12-96	0–0.5	ND (0.149)	--	ND (1.01)	--
04923[d]	58F-GR-008-0.0-SSO	Soil	03-12-96	0–0.5	ND (0.0904)	--	ND (1.03)	--
04944	58F-GR-009-0.0-SS	Soil	03-12-96	0–0.5	ND (0.151)	--	ND (1.09)	--
04944	58F-GR-010-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.171)**	--	ND (1.27)	--
04944	58F-GR-011-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.172)**	--	ND (1.26)	--
04941	58F-GR-012-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.211)**	--	**ND (3.02)**	--
04923[d]	58F-GR-012-0.0-SSO	Soil	03-12-96	0–0.5	ND (0.0772)	--	ND (1.15)	--
04944	58F-GR-013-0.0-SS	Soil	03-12-96	0–0.5	ND (0.159)	--	ND (1.15)	--
04944	58F-GR-014-0.0-SS	Soil	03-12-96	0–0.5	ND (0.158)	--	ND (1.13)	--
04944	58F-GR-015-0.0-SS	Soil	03-12-96	0–0.5	**ND (0.166)**	--	ND (1.26)	--
04941	58F-GR-016-0.0-SS	Soil	03-12-96	0–0.5	ND (0.155)	--	0.860	0.897
04944	58F-GR-016-0.0-SSD	Soil	03-12-96	0–0.5	0.0567	0.107	ND (1.17)	--
04923[d]	58F-GR-016-0.0-SSO	Soil	03-12-96	0–0.5	ND (0.0355)	--	ND (0.577)	--
04923[d]	58F-GR-016-0.0-SSOD	Soil	03-12-96	0–0.5	**ND (1.00)**	--	ND (0.905)	--
04944	58F-GR-017-0.0-SS	Soil	03-12-96	0–0.5	ND (0.160)	--	ND (1.20)	--
Background Activities—Lower Canyons Area[e]		NA	NA	NA	0.16	NA	2.31	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
04944	58F-GR-018-0.0-EB	Water	03-12-96	NA	ND (0.0857)	NA	ND (0.360)	NA
04923	58F-GR-018-0.0-EB	Water	03-12-96	NA	ND (8.16)	NA	ND (500)	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.

Table 4.4.2.2.2-11 (Concluded)
Summary of SWMU 58, Feature 58F RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

[c]Two standard deviations about the mean activity.
[d]Sample was analyzed at an off-site laboratory for isotopic uranium, thorium, and cesium-137.
[e]Dinwiddie September 1997.

58F = SWMU 58, Feature F.
EB = Equipment rinsate blank.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SSO = Surface soil sample analyzed off site.
SSOD = Soil sample duplicate analyzed off site.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.2.2-12
Summary of SWMU 58, Feature 58H RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
04946	58H-GR-001-0.0-SS	Soil	03-13-96	0–0.5	0.177	0.0317	0.726	0.342
04946	58H-GR-002-0.0-SS	Soil	03-13-96	0–0.5	0.0906	0.0269	0.916	0.444
04946	58H-GR-003-0.0-SS	Soil	03-13-96	0–0.5	0.185	0.0474	0.847	0.402
04945	58H-GR-004-0.0-SS	Soil	03-13-96	0–0.5	0.100	0.0321	0.699	0.334
04924[d]	58H-GR-004-0.0-SSO	Soil	03-13-96	0–0.5	0.128	0.0402	**ND (1.10)**	--
04946	58H-GR-005-0.0-SS	Soil	03-13-96	0–0.5	0.731	0.0231	0.726	0.355
04946	58H-GR-006-0.0-SS	Soil	03-13-96	0–0.5	0.104	0.0264	0.691	0.336
04946	58H-GR-007-0.0-SS	Soil	03-13-96	0–0.5	0.0973	0.0262	0.644	0.323
04945	58H-GR-008-0.0-SS	Soil	03-13-96	0–0.5	0.212	0.0401	0.741	0.362
04924[d]	58H-GR-008-0.0-SSO	Soil	03-13-96	0–0.5	0.278	0.0473	ND (0.877)	--
04946	58H-GR-009-0.0-SS	Soil	03-13-96	0–0.5	ND (0.0322)	--	0.610	0.300
04946	58H-GR-010-0.0-SS	Soil	03-13-96	0–0.5	0.0204	0.0141	0.662	0.336
04946	58H-GR-011-0.0-SS	Soil	03-13-96	0–0.5	ND (0.0302)	--	0.583	0.279
04945	58H-GR-012-0.0-SS	Soil	03-13-96	0–0.5	ND (0.0273)	--	0.491	0.232
04924[d]	58H-GR-012-0.0-SSO	Soil	03-13-96	0–0.5	ND (0.0108)	--	ND (0.603)	--
04946	58H-GR-013-0.0-SS	Soil	03-13-96	0–0.5	ND (0.0415)	--	0.976	0.472
04946	58H-GR-014-0.0-SS	Soil	03-13-96	0–0.5	ND (0.0300)	--	0.713	0.335
04946	58H-GR-015-0.0-SS	Soil	03-13-96	0–0.5	0.123	0.0307	0.715	0.371
04945	58H-GR-016-0.0-SS	Soil	03-13-96	0–0.5	ND (0.0326)	--	0.774	0.399
04946	58H-GR-016-0.0-SS	Soil	03-13-96	0–0.5	ND (0.0301)	--	0.692	0.326
04924[d]	58H-GR-016-0.0-SSO	Soil	03-13-96	0–0.5	ND (0.00676)	--	ND (0.973)	--
04924[d]	58H-GR-016-0.0-SSOD	Soil	03-13-96	0–0.5	ND (0.0117)	--	ND (0.955)	--
04946	58H-GR-017-0.0-SS	Soil	03-13-96	0–0.5	0.0851	0.0259	0.715	0.372
Background Activities—Lower Canyons Area[e]		NA	NA	NA	1.55	NA	1.03	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
04946	58H-GR-018-0.0-EB	Water	03-13-96	NA	ND (0.0215)	--	ND (0.135)	--
04924[d]	58H-GR-018-0.0-EB	Water	03-13-96	NA	**1.33**	**2.00**	**1.83**	**4.74**

Refer to footnotes at end of table.

Table 4.4.2.2.2-12 (Continued)
Summary of SWMU 58, Feature 58H RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
04946	58H-GR-001-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.204)**	--	**ND (2.91)**	--
04946	58H-GR-002-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.175)**	--	ND (1.19)	--
04946	58H-GR-003-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.245)**	--	**ND (3.52)**	--
04945	58H-GR-004-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.201)**	--	**ND (2.89)**	--
04924[d]	58H-GR-004-0.0-SSO	Soil	03-13-96	0–0.5	ND (0.131)	--	ND (0.998)	--
04946	58H-GR-005-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.162)**	--	ND (1.07)	--
04946	58H-GR-006-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.210)**	--	**ND (3.03)**	--
04946	58H-GR-007-0.0-SS	Soil	03-13-96	0–0.5	ND (0.152)	--	ND (1.00)	--
04945	58H-GR-008-0.0-SS	Soil	03-13-96	0–0.5	ND (0.157)	--	0.914	0.866
04924[d]	58H-GR-008-0.0-SSO	Soil	03-13-96	0–0.5	ND (0.0324)	--	ND (0.851)	--
04946	58H-GR-009-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.188)**	--	**ND (2.68)**	--
04946	58H-GR-010-0.0-SS	Soil	03-13-96	0–0.5	ND (0.136)	--	0.618	0.474
04946	58H-GR-011-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.184)**	--	**ND (2.64)**	--
04945	58H-GR-012-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.170)**	--	**ND (2.55)**	--
04924[d]	58H-GR-012-0.0-SSO	Soil	03-13-96	0–0.5	ND (0.0689)	--	ND (0.810)	--
04946	58H-GR-013-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.183)**	--	ND (1.33)	--
04946	58H-GR-014-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.202)**	--	**ND (2.97)**	--
04946	58H-GR-015-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.165)**	--	0.541	0.604
04945	58H-GR-016-0.0-SS	Soil	03-13-96	0–0.5	ND (0.153)	--	1.53	0.855
04946	58H-GR-016-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.202)**	--	**ND (2.85)**	--
04924[d]	58H-GR-016-0.0-SSO	Soil	03-13-96	0–0.5	ND (0.147)	--	ND (0.665)	--
04924[d]	58H-GR-016-0.0-SSOD	Soil	03-13-96	0–0.5	ND (0.0806)	--	ND (0.904)	--
04946	58H-GR-017-0.0-SS	Soil	03-13-96	0–0.5	**ND (0.163)**	--	0.623	0.467
Background Activities—Lower Canyons Area[e]		NA	NA	NA	0.16	NA	2.31	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
04946	58H-GR-018-0.0-EB	Water	03-13-96	NA	ND (0.147)	--	ND (1.68)	--
04924[d]	58H-GR-018-0.0-EB	Water	03-13-96	NA	**4.18**	**13.0**	**86.6**	**148**

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.

Table 4.4.2.2.2-12 (Concluded)
Summary of SWMU 58, Feature 58H RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

[c]Two standard deviations about the mean activity.
[d]Sample was analyzed at an off-site laboratory for isotopic uranium, thorium, and cesium-137.
[e]Dinwiddie September 1997.
58H = SWMU 58, Feature H.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SSO = Surface soil sample analyzed off site.
SSOD = Soil sample duplicate analyzed off site.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.2.2-13
Summary of SWMU 58, Feature 58J RFI Soil Sampling, Gamma Spectroscopy Analytical Results
September 1998
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
600804	S58J-GR-135-0-SS	Soil	09-08-98	0–0.5	1.35	0.241	0.816	0.444
600804	S58J-GR-136-0-SS	Soil	09-08-98	0–0.5	1.20	0.178	**1.04**	0.531
600804	S58J-GR-137-0-SS	Soil	09-08-98	0–0.5	0.335	0.180	0.740	0.385
600804	S58J-GR-138-0-SS	Soil	09-08-98	0–0.5	0.664	0.106	0.725	0.360
600804	S58J-GR-139-0-SS	Soil	09-08-98	0–0.5	0.452	0.083	0.835	0.398
600804	S58J-GR-140-0-SS	Soil	09-08-98	0–0.5	0.681	0.215	0.987	0.492
600804	S58J-GR-141-0-SS	Soil	09-08-98	0–0.5	1.38	0.199	0.787	1.56
600804	S58J-GR-142-0-SS	Soil	09-08-98	0–0.5	0.842	0.131	0.812	0.397
600804	S58J-GR-143-0-SS	Soil	09-08-98	0–0.5	**2.00**	0.288	**1.33**	0.704
Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
600804	S58J-GR-135-0-SS	Soil	09-08-98	0–0.5	**ND (0.273)**	--	0.517	0.499
600804	S58J-GR-136-0-SS	Soil	09-08-98	0–0.5	**ND (0.294)**	--	ND (1.01)	--
600804	S58J-GR-137-0-SS	Soil	09-08-98	0–0.5	**ND (0.208)**	--	ND (0.695)	--
600804	S58J-GR-138-0-SS	Soil	09-08-98	0–0.5	**ND (0.225)**	--	0.671	0.520
600804	S58J-GR-139-0-SS	Soil	09-08-98	0–0.5	**ND (0.237)**	--	0.63	0.42
600804	S58J-GR-140-0-SS	Soil	09-08-98	0–0.5	**0.320**	0.213	1.05	0.594
600804	S58J-GR-141-0-SS	Soil	09-08-98	0–0.5	**ND (0.254)**	--	0.808	0.521
600804	S58J-GR-142-0-SS	Soil	09-08-98	0–0.5	**ND (0.273)**	--	0.581	0.653
600804	S58J-GR-143-0-SS	Soil	09-08-98	0–0.5	**0.309**	0.301	ND (0.806)	--
Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.

Table 4.4.2.2.2-13 (Concluded)
Summary of SWMU 58, Feature 58J RFI Soil Sampling, Gamma Spectroscopy Analytical Results
September 1998
(On-Site Laboratory)

[d]Dinwiddie September 1997.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58J = SWMU 58, Feature J.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.2.2-14
Summary of SWMU 58, Feature 58L RFI Soil Sampling, Gamma Spectroscopy Analytical Results
September 1998
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
600804	S58L-GR-144-0-SS	Soil	09-08-98	0–0.5	0.326	0.0874	0.684	0.373
600804	S58L-GR-145-0-SS	Soil	09-08-98	0–0.5	1.05	0.170	0.841	0.404
600804	S58L-GR-146-0-SS	Soil	09-08-98	0–0.5	0.611	0.0989	0.827	0.399
600804	S58L-GR-147-0-SS	Soil	09-08-98	0–0.5	1.35	0.194	1.01	0.525
600804	S58L-GR-148-0-SS	Soil	09-08-98	0–0.5	0.996	0.145	0.852	0.404
600804	S58L-GR-149-0-SS	Soil	09-08-98	0–0.5	0.257	0.0960	0.881	0.440
600804	S58L-GR-150-0-SS	Soil	09-08-98	0–0.5	**2.96**	0.405	**1.07**	0.563
600804	S58L-GR-151-0-SS	Soil	09-08-98	0–0.5	**2.17**	0.308	0.897	0.439
600804	S58L-GR-152-0-SS	Soil	09-08-98	0–0.5	0.994	0.145	0.896	0.622
Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID[c]	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
600804	S58L-GR-144-0-SS	Soil	09-08-98	0–0.5	**ND (0.211)**	--	0.704	0.483
600804	S58L-GR-145-0-SS	Soil	09-08-98	0–0.5	**ND (0.263)**	--	0.404	0.414
600804	S58L-GR-146-0-SS	Soil	09-08-98	0–0.5	**ND (0.209)**	--	0.607	0.424
600804	S58L-GR-147-0-SS	Soil	09-08-98	0–0.5	**ND (0.274)**	--	0.800	0.526
600804	S58L-GR-148-0-SS	Soil	09-08-98	0–0.5	**ND (0.230)**	--	0.598	0.461
600804	S58L-GR-149-0-SS	Soil	09-08-98	0–0.5	**ND (0.220)**	--	0.609	0.405
600804	S58L-GR-150-0-SS	Soil	09-08-98	0–0.5	**ND (0.280)**	--	0.755	0.508
600804	S58L-GR-151-0-SS	Soil	09-08-98	0–0.5	**ND (0.308)**	--	ND (1.04)	--
600804	S58L-GR-152-0-SS	Soil	09-08-98	0–0.5	**ND (0.240)**	--	ND (0.587)	--
Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.

Table 4.4.2.2.2-14 (Concluded)
Summary of SWMU 58, Feature 58L RFI Soil Sampling, Gamma Spectroscopy Analytical Results
September 1998
(On-Site Laboratory)

ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58L = SWMU 58, Feature L.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.2.2-15
Summary of SWMU 58, Feature 58S RFI Soil Sampling, Gamma Spectroscopy Analytical Results
October 1997
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
06199	1332-58S-001-0.5-SS	Soil	10-16-97	0–0.5	0.102	0.0264	0.868	0.443
06200	1332-58S-002-0.5-SS	Soil	10-16-97	0–0.5	0.0471	0.0253	0.906	0.453
06200	1332-58S-003-0.5-SS	Soil	10-16-97	0–0.5	0.107	0.0335	0.914	0.462
06199	1332-58S-004-0.5-SS	Soil	10-16-97	0–0.5	0.108	0.0362	0.728	0.384
06199	1332-58S-005-0.5-SS	Soil	10-16-97	0–0.5	0.160	0.0506	0.857	0.458
06200	1332-58S-006-0.5-SS	Soil	10-16-97	0–0.5	0.127	0.0370	0.719	0.364
06200	1332-58S-007-0.5-SS	Soil	10-16-97	0–0.5	0.926	0.140	0.792	0.436
06200	1332-58S-008-0.5-SS	Soil	10-16-97	0–0.5	0.210	0.0491	0.802	0.418
06200	1332-58S-009-0.5-SS	Soil	10-16-97	0–0.5	0.155	0.0471	0.759	0.375
06199	1332-58S-010-0.5-SS	Soil	10-16-97	0–0.5	0.127	0.0403	0.887	0.429
06200	1332-58S-011-0.5-SS	Soil	10-16-97	0–0.5	0.0859	0.0449	0.868	0.433
06200	1332-58S-012-0.5-SS	Soil	10-16-97	0–0.5	0.274	0.0606	0.781	0.414
06200	1332-58S-013-0.5-SS	Soil	10-16-97	0–0.5	0.344	0.0654	0.741	0.356
06200	1332-58S-014-0.5-SS	Soil	10-16-97	0–0.5	0.606	0.0984	0.948	0.457
06199	1332-58S-015-0.5-SS	Soil	10-16-97	0–0.5	0.0412	0.0328	0.863	0.444
06200	1332-58S-016-0.5-SS	Soil	10-16-97	0–0.5	0.460	0.0782	0.938	0.479
06200	1332-58S-017-0.5-SS	Soil	10-16-97	0–0.5	0.193	0.0494	0.829	0.392
06200	1332-58S-018-0.5-SD	Soil	10-16-97	0–0.5	0.235	0.0498	0.864	0.413
Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
06200	1332-58S-019-FB	Water	10-16-97	NA	ND (0.0233)	NA	ND (0.141)	NA
06200	1332-58S-020-EB	Water	10-16-97	NA	ND (0.0293)	NA	ND (0.175)	NA

Refer to footnotes at end of table.

Table 4.4.2.2.2-15 (Concluded)
Summary of SWMU 58, Feature 58S RFI Soil Sampling, Gamma Spectroscopy Analytical Results
October 1997
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID[c]	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
06199	1332-58S-001-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.244)**	--	**ND (3.49)**	--
06200	1332-58S-002-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.272)**	--	**ND (3.72)**	--
06200	1332-58S-003-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.249)**	--	**ND (3.34)**	--
06199	1332-58S-004-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.252)**	--	**ND (3.42)**	--
06199	1332-58S-005-0.5-SS	Soil	10-16-97	0–0.5	0.0696	NC	**ND (3.58)**	--
06200	1332-58S-006-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.237)**	--	**ND (3.22)**	--
06200	1332-58S-007-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.270)**	--	**ND (3.69)**	--
06200	1332-58S-008-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.253)**	--	**ND (3.42)**	--
06200	1332-58S-009-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.227)**	--	**ND (3.10)**	--
06199	1332-58S-010-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.254)**	--	**ND (3.44)**	--
06200	1332-58S-011-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.245)**	--	**ND (3.41)**	--
06200	1332-58S-012-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.249)**	--	**ND (3.49)**	--
06200	1332-58S-013-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.236)**	--	**ND (3.15)**	--
06200	1332-58S-014-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.279)**	--	**ND (3.75)**	--
06199	1332-58S-015-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.266)**	--	**ND (3.61)**	--
06200	1332-58S-016-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.267)**	--	**ND (3.54)**	--
06200	1332-58S-017-0.5-SS	Soil	10-16-97	0–0.5	**ND (0.234)**	--	**ND (3.20)**	--
06200	1332-58S-018-0.5-SD	Soil	10-16-97	0–0.5	**ND (0.258)**	--	**ND (3.43)**	--
Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
06200	1332-58S-019-FB	Water	10-16-97	NA	ND (0.159)	NA	ND (1.68+00)	NA
06200	1332-58S-020-EB	Water	10-16-97	NA	ND (0.182)	NA	ND (2.15+00)	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.

58S = SWMU 58, Feature S.
EB = Equipment blank.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
NC = Not calculated.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation
SD = Sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.2.2-16
Summary of SWMU 58, Feature 58U RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
04954	58DRT-GR-001-0.0-SS	Soil	03-14-96	0–0.5	0.580	0.0823	0.725	0.336
04954	58DRT-GR-002-0.0-SS	Soil	03-14-96	0–0.5	1.27	0.171	0.893	0.431
04954	58DRT-GR-003-0.0-SS	Soil	03-14-96	0–0.5	0.828	0.115	0.943	0.445
04955	58DRT-GR-004-0.0-SS	Soil	03-14-96	0–0.5	**1.87**	0.248	0.959	0.453
04956[d]	58DRT-GR-004-0.0-SS	Soil	03-14-96	0–0.5	**2.06**	0.0956	**ND (1.18)**	--
04954	58DRT-GR-005-0.0-SS	Soil	03-14-96	0–0.5	0.615	0.0890	0.796	0.374
04954	58DRT-GR-006-0.0-SS	Soil	03-14-96	0–0.5	1.34	0.181	0.996	0.462
04954	58DRT-GR-007-0.0-SS	Soil	03-14-96	0–0.5	1.40	0.189	0.962	0.482
04955	58DRT-GR-008-0.0-SS	Soil	03-14-96	0–0.5	1.51	0.217	**1.10**	0.541
04956[d]	58DRT-GR-008-0.0-SS	Soil	03-14-96	0–0.5	**1.78**	0.0907	**ND (1.31)**	--
04954	58DRT-GR-009-0.0-SS	Soil	03-14-96	0–0.5	**1.95**	0.261	**1.29**	0.609
04954	58DRT-GR-010-0.0-SS	Soil	03-14-96	0–0.5	**1.80**	0.241	**1.06**	0.494
04954	58DRT-GR-011-0.0-SS	Soil	03-14-96	0–0.5	**1.61**	0.271	**1.23**	0.590
04955	58DRT-GR-012-0.0-SS	Soil	03-14-96	0–0.5	0.175	0.0310	0.784	0.375
04956[d]	58DRT-GR-012-0.0-SS	Soil	03-14-96	0–0.5	0.218	0.0750	ND (0.988)	--
04954	58DRT-GR-013-0.0-SS	Soil	03-14-96	0–0.5	0.0937	0.0290	0.709	0.337
04954	58DRT-GR-014-0.0-SS	Soil	03-14-96	0–0.5	0.0840	0.0190	0.672	0.318
04954	58DRT-GR-015-0.0-SS	Soil	03-14-96	0–0.5	1.08	0.146	0.856	0.423
04955	58DRT-GR-016-0.0-SS	Soil	03-14-96	0–0.5	**1.59**	0.230	**1.21**	0.591
04956[d]	58DRT-GR-016-0.0-SS	Soil	03-14-96	0–0.5	1.39	0.0778	**ND (1.31)**	--
04956[d]	58DRT-GR-016-0.0-SSD	Soil	03-14-96	0–0.5	**1.60**	0.0850	**ND (1.31)**	--
04954	58DRT-GR-017-0.0-SS	Soil	03-14-96	0–0.5	1.27	0.173	1.03	0.484
Background Activities—Lower Canyons Area[e]		NA	NA	NA	1.55	NA	1.03	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
04956[d]	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	NA	NA	ND (0.00266)	NA
04956[d]	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	ND (10)	NA	ND (15)	NA
04954	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	ND (0.0243)	NA	ND (0.128)	NA

Refer to footnotes at end of table.

Table 4.4.2.2.2-16 (Continued)
Summary of SWMU 58, Feature 58U RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
04954	58DRT-GR-001-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.226)**	--	**ND (3.26)**	--
04954	58DRT-GR-002-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.251)**	--	**ND (3.51)**	--
04954	58DRT-GR-003-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.237)**	--	**ND (3.32)**	--
04955	58DRT-GR-004-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.269)**	--	**ND (3.85)**	--
04956[d]	58DRT-GR-004-0.0-SS	Soil	03-14-96	0–0.5	ND (0.0574)	--	0.684B	0.112
04954	58DRT-GR-005-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.256)**	--	**ND (3.63)**	--
04954	58DRT-GR-006-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.265)**	--	**ND (3.73)**	--
04954	58DRT-GR-007-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.284)**	--	**ND (3.98)**	--
04955	58DRT-GR-008-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.217)**	--	1.66	1.40
04956[d]	58DRT-GR-008-0.0-SS	Soil	03-14-96	0–0.5	ND (0.0138)	--	0.746	0.113
04954	58DRT-GR-009-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.314)**	--	**ND (4.71)**	--
04954	58DRT-GR-010-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.303)**	--	**ND (4.38)**	--
04954	58DRT-GR-011-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.308)**	--	**ND (4.36)**	--
04955	58DRT-GR-012-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.205)**	--	**ND (2.92)**	--
04956[d]	58DRT-GR-012-0.0-SS	Soil	03-14-96	0–0.5	ND (0.0535)	--	0.526	0.0906
04954	58DRT-GR-013-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.201)**	--	**ND (2.97)**	--
04954	58DRT-GR-014-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.209)**	--	**ND (3.01)**	--
04954	58DRT-GR-015-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.239)**	--	**ND (3.43)**	--
04955	58DRT-GR-016-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.212)**	--	0.767	0.916
04956[d]	58DRT-GR-016-0.0-SS	Soil	03-14-96	0–0.5	ND (0.0245)	--	0.818	0.111
04956[d]	58DRT-GR-016-0.0-SSD	Soil	03-14-96	0–0.5	ND (0.0415)	--	0.744	0.107
04954	58DRT-GR-017-0.0-SS	Soil	03-14-96	0–0.5	**ND (0.274)**	--	**ND (3.99)**	--
Background Activities—Lower Canyons Area[e]		NA	NA	NA	0.16	NA	2.31	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
04956[d]	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	ND (0.0311)	NA	ND (0.0115)	NA
04956[d]	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	ND (21.5)	NA	ND (500)	NA
04954	58DRT-GR-018-0.0-EB	Water	03-14-96	NA	ND (0.151)	NA	ND (1.69)	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.

Table 4.4.2.2.2-16 (Concluded)
Summary of SWMU 58, Feature 58U RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1996
(On- and Off-Site Laboratories)

[c]Two standard deviations about the mean activity.
[d]Sample was analyzed off-site for isotopic uranium, thorium, and cesium-137.
[e]Dinwiddie September 1997.
58DRT = SWMU 58, Doppler Radar Test (Feature U).
B = Analyte present in associated blank.
EB = Equipment blank.
ER = Environmental Restoration.
ID = Identification.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.2.2-17
Summary of SWMU 58, Feature 58X RFI Soil Sampling, Gamma Spectroscopy Analytical Results
May 1996
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
05083	58X-GR-001-.5-SS	Soil	05-06-96	0–0.5	0.108	0.0247	0.972	0.457
05083	58X-GR-002-.5-SS	Soil	05-06-96	0–0.5	0.396	0.0633	0.768	0.358
05083	58X-GR-003-.5-SS	Soil	05-06-96	0–0.5	0.324	0.0574	0.905	0.423
05083	58X-GR-004-.5-SS	Soil	05-06-96	0–0.5	0.125	0.0276	0.811	0.383
05114	58X-GR-005-.5.SS	Soil	05-06-96	0–0.5	0.627	0.0982	0.808	0.402
05085	58X-GR-005-.5-SS[d]	Soil	05-06-96	0–0.5	Not analyzed	NA	**1.06**	**0.181**
05085	58X-GR-005-.5-SS[e]	Soil	05-06-96	0–0.5	0.790	0.0672	**1.12**	**0.0730**
05083	58X-GR-006-.5-SS	Soil	05-06-96	0–0.5	0.138	0.0331	0.831	0.393
05083	58X-GR-007-.5-SS	Soil	05-06-96	0–0.5	0.396	0.0618	0.825	0.384
05083	58X-GR-008-.5-SS	Soil	05-06-96	0–0.5	0.0472	0.0211	0.892	0.420
05083	58X-GR-009-.5-SS	Soil	05-06-96	0–0.5	ND (0.0319)	--	0.811	0.381
05114	58X-GR-010-.5-SS	Soil	05-06-96	0–0.5	0.0544	0.0216	0.749	0.348
05083	58X-GR-011-.5-SS	Soil	05-06-96	0–0.5	0.0266	0.0318	**1.05**	0.500
05083	58X-GR-012-.5-SS	Soil	05-06-96	0–0.5	0.168	0.0305	0.804	0.376
05083	58X-GR-013-.5-SS	Soil	05-06-96	0–0.5	0.200	0.0399	0.856	0.402
05083	58X-GR-014-.5-SS	Soil	05-06-96	0–0.5	0.158	0.0316	0.827	0.390
05114	58X-GR-015-.5-SS	Soil	05-06-96	0–0.5	0.670	0.103	0.753	0.368
05083	58X-GR-016-.5-SS	Soil	05-06-96	0–0.5	0.529	0.0764	0.824	0.382
05083	58X-GR-017-.5-SS	Soil	05-06-96	0–0.5	0.0743	0.0214	0.770	0.368
NMED-Approved Background Activities—Lower Canyons Area[f]		NA	NA	NA	1.55	NA	1.03	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
05083	58X-GR-016-EB	Water	05-06-96	NA	ND (0.0210)	NA	ND (0.120)	NA
05083	58X-GR-016-FB	Water	05-06-96	NA	ND (0.0216)	NA	ND (0.132)	NA

Refer to footnotes at end of table.

Table 4.4.2.2.2-17 (Continued)
Summary of SWMU 58, Feature 58X RFI Soil Sampling, Gamma Spectroscopy Analytical Results
May 1996
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
05083	58X-GR-001-.5-SS	Soil	05-06-96	0–0.5	**0.378**	0.196	**6.55**	2.79
05083	58X-GR-002-.5-SS	Soil	05-06-96	0–0.5	**0.254**	0.0983	**3.94**	3.00
05083	58X-GR-003-.5-SS	Soil	05-06-96	0–0.5	0.144	0.146	**2.95**	2.52
05083	58X-GR-004-.5-SS	Soil	05-06-96	0–0.5	**ND (0.228)**	--	**ND (3.21)**	--
05114	58X-GR-005-.5.SS	Soil	05-06-96	0–0.5	**2.42**	0.411	**46.8**	12.4
05085	58X-GR-005-.5-SS[e]	Soil	05-06-96	0–0.5	**0.232**	0.0186	**3.00**	0.0186
05085	58X-GR-005-.5-SS[f]	Soil	05-06-96	0–0.5	**2.21**	0.306	**40.3**	2.82
05083	58X-GR-006-.5-SS	Soil	05-06-96	0–0.5	**0.299**	0.212	**3.16**	2.30
05083	58X-GR-007-.5-SS	Soil	05-06-96	0–0.5	**0.738**	0.185	**13.7**	4.22
05083	58X-GR-008-.5-SS	Soil	05-06-96	0–0.5	**0.242**	0.175	**8.09**	3.62
05083	58X-GR-009-.5-SS	Soil	05-06-96	0–0.5	**ND (0.225)**	--	**ND (3.25)**	--
05114	58X-GR-010-.5-SS	Soil	05-06-96	0–0.5	0.115	0.101	2.28	1.07
05083	58X-GR-011-.5-SS	Soil	05-06-96	0–0.5	**0.231**	0.165	**ND (3.96)**	--
05083	58X-GR-012-.5-SS	Soil	05-06-96	0–0.5	**0.271**	0.127	**5.23**	2.41
05083	58X-GR-013-.5-SS	Soil	05-06-96	0–0.5	**ND (0.229)**	--	**ND (3.25)**	--
05083	58X-GR-014-.5-SS	Soil	05-06-96	0–0.5	**ND (0.217)**	--	**ND (3.21)**	--
05114	58X-GR-015-.5-SS	Soil	05-06-96	0–0.5	**0.823**	0.207	**17.3**	4.72
05083	58X-GR-016-.5-SS	Soil	05-06-96	0–0.5	**ND (0.247)**	--	**ND (3.48)**	--
05083	58X-GR-017-.5-SS	Soil	05-06-96	0–0.5	**0.589**	0.200	**9.24**	3.52
NMED-Approved Background Activities—Lower Canyons Area[f]		NA	NA	NA	0.16	NA	2.31	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
05083	58X-GR-016-EB	Water	05-06-96	NA	ND (0.142)	NA	ND (1.64)	NA
05083	58X-GR-016-FB	Water	05-06-96	NA	ND (0.145)	NA	ND (1.64)	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Analyzed by alpha spectroscopy.
[e]Analyzed by gamma spectroscopy.
[g]Dinwiddie September 1997.

Table 4.4.2.2.2-17 (Concluded)
Summary of SWMU 58, Feature 58X RFI Soil Sampling, Gamma Spectroscopy Analytical Results
May 1996
(On-Site Laboratory)

58X = SWMU 58, Feature X.
EB = Equipment blank.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.2.2-18
Summary of SWMU 58, Feature 58Z RFI Soil Sampling, Gamma Spectroscopy Analytical Results
June 1995
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
03869	58-GR-001-0-SS	Soil	06-27-95	0–0.5	0.219	0.0520	0.882	0.293
03869	58-GR-002-0-SS	Soil	06-27-95	0–0.5	0.165	0.0462	0.856	0.280
03869	58-GR-003-0-SS	Soil	06-27-95	0–0.5	0.391	0.0777	0.794	0.274
03869	58-GR-004-0-SS	Soil	06-27-95	0–0.5	0.317	0.0662	0.731	0.358
03869	58-GR-005-0-SS	Soil	06-27-95	0–0.5	0.256	0.0596	0.756	0.297
03869	58-GR-006-0-SS	Soil	06-27-95	0–0.5	0.454	0.0807	0.742	0.259
03869	58-GR-007-0-SS	Soil	06-27-95	0–0.5	0.316	0.0693	0.786	0.276
03869	58-GR-008-0-SS	Soil	06-27-95	0–0.5	0.256	0.0539	0.661	0.238
03869	58-GR-009-0-SS	Soil	06-27-95	0–0.5	0.227	0.0539	0.686	0.250
03869	58-GR-010-0-SS	Soil	06-27-95	0–0.5	0.171	0.0454	0.872	0.302
03869	58-GR-011-0-SS	Soil	06-27-95	0–0.5	0.187	0.0498	0.745	0.246
03869	58-GR-012-0-SS	Soil	06-27-95	0–0.5	0.180	0.0521	0.822	0.319
03869	58-GR-013-0-SS	Soil	06-27-95	0–0.5	0.460	0.0816	0.733	0.119
03869	58-GR-014-0-SS	Soil	06-27-95	0–0.5	0.165	0.0451	0.726	0.221
03869	58-GR-015-0-SS	Soil	06-27-95	0–0.5	0.179	0.0463	0.833	0.260
03869	58-GR-016-0-SS	Soil	06-27-95	0–0.5	0.162	0.0477	0.837	0.291
03869	58-GR-017-0-SS	Soil	06-27-95	0–0.5	0.248	0.0594	0.667	0.229
NMED-Approved Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA

Refer to footnotes at end of table.

Table 4.4.2.2.2-18 (Concluded)
Summary of SWMU 58, Feature 58Z RFI Soil Sampling, Gamma Spectroscopy Analytical Results
June 1995
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Uranium-235		Uranium-238	
					Result	Error	Result	Error
03869	58-GR-001-0-SS	Soil	06-27-95	0–0.5	**ND (0.401)**	--	**ND (5.35)**	--
03869	58-GR-002-0-SS	Soil	06-27-95	0–0.5	**ND (0.474)**	--	**ND (5.98)**	--
03869	58-GR-003-0-SS	Soil	06-27-95	0–0.5	**ND (0.434)**	--	**ND (6.14)**	--
03869	58-GR-004-0-SS	Soil	06-27-95	0–0.5	**ND (0.445)**	--	**ND (5.93)**	--
03869	58-GR-005-0-SS	Soil	06-27-95	0–0.5	**ND (0.445)**	--	**ND (6.15)**	--
03869	58-GR-006-0-SS	Soil	06-27-95	0–0.5	**ND (0.426)**	--	**ND (6.04)**	--
03869	58-GR-007-0-SS	Soil	06-27-95	0–0.5	**ND (0.454)**	--	**ND (6.33)**	--
03869	58-GR-008-0-SS	Soil	06-27-95	0–0.5	**ND (0.408)**	--	**ND (5.70)**	--
03869	58-GR-009-0-SS	Soil	06-27-95	0–0.5	**ND (0.414)**	--	**ND (5.60)**	--
03869	58-GR-010-0-SS	Soil	06-27-95	0–0.5	**ND (0.403)**	--	**ND (5.43)**	--
03869	58-GR-011-0-SS	Soil	06-27-95	0–0.5	**ND (0.406)**	--	**ND (5.62)**	--
03869	58-GR-012-0-SS	Soil	06-27-95	0–0.5	**ND (0.483)**	--	**ND (6.65)**	--
03869	58-GR-013-0-SS	Soil	06-27-95	0–0.5	**ND (0.388)**	--	**ND (5.25)**	--
03869	58-GR-014-0-SS	Soil	06-27-95	0–0.5	**ND (0.395)**	--	**ND (5.12)**	--
03869	58-GR-015-0-SS	Soil	06-27-95	0–0.5	**ND (0.392)**	--	**ND (5.53)**	--
03869	58-GR-016-0-SS	Soil	06-27-95	0–0.5	**ND (0.404)**	--	**ND (5.58)**	--
03869	58-GR-017-0-SS	Soil	06-27-95	0–0.5	**ND (4.35)**	--	**ND (5.98)**	--
NMED-Approved Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.

58 = SWMU 58.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.2.2-19
Summary of SWMU 58, Feature 58U RFI Soil Sampling, Gross Alpha Beta Analytical Results
November 1997
(Off-Site Laboratory)

Sample Attributes					Gross Alpha and Gross Beta (pCi/g)			
Record Number[a]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Gross Alpha	Accuracy, Gross Alpha (+/-)	Gross Beta	Accuracy, Gross Beta (+/-)
510045	58DRT-GR-009-0.0-SS	Soil	11-06-97	0–0.5	23.8	4.66	28.1	3.89
510045	58DRT-GR-015-0.0-SS	Soil	11-06-97	0–0.5	19.4	4.28	23.9	3.71
510045	58DRT-GR-017-0.0-SS	Soil	11-06-97	0–0.5	17.2	4.26	25.4	4.00

[a]Analysis request/chain-of-custody record.
58DRT = SWMU 58, Doppler Radar Test (Feature U).
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

- Seven samples from SWMU 58U contained elevated copper concentrations ranging from 17.6 to 29J mg/kg, compared to a background limit of 17.1 mg/kg.

- Five samples from SWMU 58H and seven samples from SWMU 58U contained elevated lead levels ranging from to 19 to 47.5 mg/kg, compared to a background limit of 18.9 mg/kg.

- Two samples collected at SWMU 58F and three samples from SWMU 58U contained elevated mercury concentrations ranging from 0.0764 to 0.585 mg/kg, compared to the background limit of 0.055 mg/kg.

- One sample from SWMU 58F and seven samples from SWMU 58U contained elevated zinc levels ranging from 53.4 to 85 mg/kg, compared to a background limit of 52.1 mg/kg.

- One sample from SWMU 58H and one sample from SWMUs 58U contained elevated selenium levels of 8.04J and 59J mg/kg, compared to the background limit of 2.7 mg/kg.

- One sample from SWMU 58F and one sample collected at SWMU 58U contained elevated silver concentrations of 0.591J and 2.1J mg/kg, compared to the background limit of 0.5 mg/kg.

HE Compounds

Soil samples collected from SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z were analyzed for HE compounds. The sample locations are exactly the same locations where samples were collected for metals/radionuclides analysis.

Tables 4.4.2.2.2-5 through 4.4.2.2.2-8 summarize the HE analysis results for the soil samples collected at SWMUs 58F, 58J, 58L, and 58S. The following HE detections were reported:

- One sample from SWMUs 58F and 58L contained HMX at concentrations of 450 and 520 μg/kg.

- Three samples from SWMU 58F contained m-dinitrobenzene at concentrations ranging from 90 to 150 μg/kg.

- Two samples from SWMU 58J contained 2-amino-4,6-dinitrotoluene at concentrations of 110 and 130 μg/kg.

- One sample from SWMUs 58J, 58L, and 58S contained 2,4,6-trinitrotoluene at concentrations ranging from 150 to 6,300 μg/kg.

- One sample from SWMU 58S contained 4-amino-2,6-dinitrotoluene at 680 μg/kg.

No HE compounds were detected in any of the samples collected from SWMUs 58H, 58U, 58X, and 58Z. Table 4.4.2.2.2-9 provides the analytical MDLs for the HE compounds investigated at SWMUs 58F, 58H, 58J, 58L, and 58S in 1997 and 1998. Table 4.4.2.2.2-10 provides the analytical MDLs for the HE compounds investigated at SWMUs 58U, 58X, and 58Z in 1996.

Radionuclides

A total of 140 soil samples from SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z were collected and analyzed for radionuclides by gamma spectroscopy. In addition, 15 samples from SWMUs 58F, 58H, and 58U were analyzed off site for isotopic uranium/thorium by alpha spectroscopy and cesium-137 by gamma spectroscopy. The sample locations are exactly the same locations where samples were collected for metals analysis.

Tables 4.4.2.2.2-11 through 4.4.2.2.2-18 summarize the on-site and off-site gamma spectroscopy analytical results for the RFI soil samples collected at SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z.

- Twelve samples (for SWMU 58X) contained uranium-238 activity levels above the background limit of 2.31 pCi/g, with activities ranging from 2.95 to 46.8 pCi/g; 67 samples were reported with MDAs above the background limit, ranging from 2.55 to 6.65 pCi/g.

- Eleven samples contained thorium-232 activity levels above the background limit of 1.03 pCi/g, ranging from 1.04 to 2.33 pCi/g, compared to the background limit of 1.03 pCi/g. Five results were reported with MDAs above the background limit, ranging from 1.10 to 1.31 pCi/g.

- Fourteen samples contained uranium-235 activity levels above the background limit of 0.16 pCi/g. Twelve of the samples were from SWMU 58X. The highest activity of 2.42 pCi/g was at SWMU 58X. Ninety-seven samples were reported with MDAs above the background limit, ranging from 0.162 to 1.00 pCi/g.

- Eleven samples contained cesium-137 activities above the background limit of 1.55 pCi/g, ranging from 1.59 to 2.96 pCi/g. Eight of these samples were from SWMU 58U.

Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

Table 4.4.2.2.2-19 summarizes the off-site gross alpha/gross beta activity results for the three RFI samples collected at SWMU 58U. All three samples contained gross alpha/gross beta activity within natural levels.

4.4.2.2.2.1 Data Quality Results for SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z (SWMU 58 Test Locations Involving Detonation of Explosives)

This section discusses the results of the analyses of the QA/QC samples that were collected during the RFI at SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z. The QA/QC samples were collected as part of the 1995, 1996, 1997, 1998 sampling events, and included 11 duplicate samples, 12 EBs, and 4 FBs. The EBs/FBs were analyzed for metals, HE compounds, and radionuclides.

For features where metal analyses were performed (SWMUs 58F, 58H, and 58U), metal concentrations in the EB samples were slightly greater than the MDLs for arsenic, barium, beryllium, chromium, copper, lead, mercury, and zinc. The concentrations of arsenic, beryllium, cadmium, chromium, copper, lead, and mercury were below the PQL, and the results were

qualified as J (estimated). No HE compounds or radionuclides (cesium-237, thorium-232, uranium-235, or uranium-238) were detected in the EB/FB samples, with the exception of one sample analyzed off site for radiological analyses.

For features where metals analyses were performed (SWMUs 58F, 58H, and 58U), metal concentrations in the FB sample was slightly above the MDLs for arsenic, cadmium, mercury, and zinc. The concentrations of cadmium, mercury, and zinc were below the PQL, and the results were qualified as J (estimated).

RPDs were calculated for the metals detected in the primary and duplicate samples for SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z, which were analyzed by GEL and ERCL. The RPDs are presented in Tables 4.4.2.2.2-20 through 4.4.2.2.2-22. Three of the six sample pairs exceeded the RPD limit for mercury. Two of the six sample pairs analyzed for metals exceeded the acceptable RPD limit of 25 percent for chromium, lead, and selenium. One of the six sample pairs exceeded the RPD limits for barium, cadmium, and silver. Although some of the RPDs presented in Tables 4.4.2.2.2-20 through 4.4.2.2.2-22 exceed the RPD limit for barium, cadmium, chromium, lead, mercury, selenium, and silver, the values are typical of the heterogeneous soil and are therefore acceptable.

Duplicate samples for analyses of HE compounds were collected from SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z. Primary and duplicate samples analyzed for HE compounds yielded nondetections for all samples, except the duplicate samples from SWMUs 58F and 58J.

Data Validation Results for SWMUs 58F, 58H, 58J, 58L, 58S, 58U, 58X, and 58Z (SWMU 58 Test Locations Involving Detonation of Explosives)

All off-site laboratory results were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For AR/COCs 04399, 05071, 05085, 06296, 510043, and 510045, QC measures were adequate. No sample results were qualified.

For AR/COC 03871, validation qualifications were applied to the HE compound and metal data for soil sample results. The MSD recovery for HMX was outside the QC limits and the result was qualified as nondetect, estimated. The MSD RPDs for 1,3,5-trinitrobenzene, 1,3-dinitrobenzene, nitrobenzene, methyl-2,4,6-trinitrophenylnitramine (tetryl), 2,4,6-trinitrotoluene, 4-amino-2,6-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene, 4-nitrotoluene, and 3-nitrotoluene were outside the QC limits, and the results were qualified as nondetect, estimated. No other sample results were qualified.

Table 4.4.2.2.2-20
Summary of SWMU 58, Feature 58F Field Duplicate Relative Percent Difference Values
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
04923	58F-GR-016-0.0-SS 58F-GR-016-0.0-SSD	0–0.5	3.92	0.14	4.70	3.08	22.41	7.45	0.37	173.94	8.54	30.30	NC	2.53
06299	58F-GR-001-0.0-SS 58F-GR-018-0.0-SSD	0–0.5	18.86	12.96	10.16	NC	0.92	10.28	9.26	NC	10.32	NC	1.06	7.58

[a]Analysis request/chain-of-custody record.

[b]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.

58F = SWMU 58, Feature F.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NC = Not calculated for nondetected results or laboratory estimated values.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SSO = Surface soil sample analyzed off site.
SSOD = Soil sample duplicate analyzed off site.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-21
Summary of SWMU 58, Feature 58H Field Duplicate Relative Percent Difference Values
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
04924	58H-GR-016-0.0-SS 58H-GR-016-0.0-SSD	0–0.5	2.5	22.46	0.61	2.25	6.06	0.92	15.47	13.82	1.07	NC	NC	4.39
510043	58H-GR-001-0.0-SS 58H-GR-018-0.0-SD	0–0.5	21.05	0.89	8.87	NC	33.66	10.88	28.86	36.55	9.92	NC	19.45	13.23

[a]Analysis request/chain-of-custody record.

[b]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.

58H = SWMU 58, Feature H.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NC = Not calculated for nondetected results or laboratory estimated values.
SD = Soil sample duplicate.
SS = Surface soil sample.
SSO = Surface soil sample analyzed off site.
SSOD = Soil sample duplicate analyzed off site.
SWMU = Solid Waste Management Unit.

Table 4.4.2.2.2-22
Summary of SWMU 58, Feature 58U Field Duplicate Relative Percent Difference Values
March 1996 and October 1997
(On- and Off-Site Laboratories)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
04956	58DRT-GR-016-0.0-SS 58DRT-GR-016-0.0-SSD	0–0.5	2.9	3.94	0.24	62.00	5.25	1.98	65.73	14.85	1.32	166	NC	6.65
510045	58DRT-GR-002-0.0-SS 58DRT-GR-002-0.0-SSD	0–0.5	24.69	58.33	19.83	NC	29.11	9.52	3.26	65.56	12.38	NC	73.00	15.97

[a]Analysis request/chain-of-custody record.
58DRT = SWMU 58, Doppler Radar Test (Feature U).
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NC = Not calculated for nondetected results or laboratory estimated values.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

For AR/COC 04923, validation qualifications were applied to the metals and radiochemical data for soil and aqueous sample results. Mercury was detected in the method blank for the EB, and the mercury concentrations were qualified as estimated in the associated samples. Thorium-232 was detected in the method blank for the EB, and the result was qualified as estimated. No other sample results were qualified.

For AR/COC 04924, validation qualifications were applied to the metals data for soil and aqueous sample results and radiochemical data for soil sample results. Beryllium was detected in the method blank for the EB, and the associated sample result was qualified as estimated. Zinc was detected in the EB, and the results were qualified as estimated in the associated samples. Thorium-234 and uranium-238 were detected in the method blank, and the associated results were qualified as estimated. No other sample results were qualified.

For AR/COC 04956, validation qualifications were applied to the metals and radiochemical data for soil and aqueous sample results. Beryllium was detected in the method blank for the EB and was qualified as estimated. Uranium-238 was detected in the method blank for the EB, and the result was qualified as estimated. The field duplicate replicate error ratio for cesium-137 was outside QC limits and was qualified as estimated. No other sample results were qualified.

For AR/COC 06299, validation qualifications were applied to the metals data for soil sample results. Silver was detected in the method blank for the soil samples and was qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 600803, validation qualifications were applied to the HE compound data for soil and aqueous sample results. The samples were not analyzed within the prescribed holding times. All nondetected sample results are qualified as nondetect, estimated and all positive sample results are qualified as estimated. No other sample results were qualified.

For AR/COC 600805, validation qualifications were applied to the HE compound data for soil and aqueous sample results. The LCS/LCSD percent recoveries for nitrobenzene, 2-nitrotoluene, and 3-nitrotoluene were outside QC limits for the EB, and the results were qualified as unusable. The LCS/LCSD RPD for tetryl was outside QC limits for the EB, and the result was qualified as unusable. The LCS/LCSD percent recovery for tetryl were outside QC limits for the soil samples, and the results were qualified as unusable for the associated samples. No other sample results were qualified.

For AR/COC 600806, validation qualifications were applied to the HE compound data for soil sample results. The LCS/LCSD percent recovery were outside QC limits for tetryl, and the result was qualified as unusable. No other sample results were qualified.

4.4.2.3 SWMUs 58FF, 58I, 58O, 58TT, 58UU, 58VV (SWMU 58 Test Locations Involving Burn Tests)

The following six features involved burn tests that took place throughout SWMU 58:

- Pile of Fire Bricks (SWMU 58FF)
- Missile Trap Test Location (SWMU 58I)
- Empty Pit with a Mound (SWMU 58O)
- Fire Brick Area No. 2 (SWMU 58TT)
- Fire Brick Area No. 3 (SWMU 58UU)
- Fire Brick Area No. 1 (SWMU 58VV)

These tests may have generated metal and HE combustion by-products. The OU 1332 RFI Work Plan (SNL/NM June 1995) provides a complete description of these features and associated tests. This section describes the RFI sampling conducted at these features.

Because SWMU 58FF required a surface radiological cleanup and two additional rounds of subsurface characterization activities, this feature is discussed separately in Sections 4.4.2.3.1 and 4.4.2.3.2. The remaining burn test locations are described in Sections 4.4.2.3.3 and 4.4.2.3.4.

4.4.2.3.1 Sampling Activities at 58FF (Pile of Fire Bricks)

SWMU 58FF was the site of a burn test with an inert nuclear weapon (without fissionable materials) to investigate how the explosives inside the weapon would react. In 1995, RFI sampling was performed at this feature. Sixteen samples were collected at random locations along a radial pattern and one sample was collected at the center. The same surface locations were resampled in January 1999, and the sample locations are shown in Figure 4.4.2.3.1-1. The samples were analyzed for metals, VOCs, SVOCs, and HE compounds at GEL, LAS, and ERCL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

In April 1996, one borehole was advanced at the center of SWMU 58FF (Figure 4.4.2.3.1-2) to a depth of 19.5 feet bgs. Subsurface samples were collected at 1.0, 5.5, 10.5, and 19.5 feet bgs. The samples were analyzed for metals, HE compounds, SVOCs, and VOCs at GEL.

Because heavy metals (primarily lead) were found in the subsurface samples collected in April 1996 from the borehole, six additional boreholes were advanced at SWMU 58FF in August 1996. The borehole locations are shown in Figure 4.4.2.3.1-2. Subsurface samples were collected from each borehole at 5.0, 10.0, 19.0, 24.0, and 29.0 feet bgs. The samples were analyzed for metals at the off-site laboratory, GEL, and for radionuclides by gamma spectroscopy at the on-site SNL/NM RPSD Laboratory.

A radiation VCM was conducted in October 1996 to remove contaminated soil and debris (SNL/NM September 1997); contaminated soil was removed from the center of the site.

In order to further characterize the subsurface at SWMU 58FF, seven additional boreholes were drilled at the site in April 1997 (Figure 4.4.2.3.1-2). The boreholes were advanced to a depth of 50.0 feet bgs, and subsurface samples were collected at 10.0, 20.0, 30.0, 40.0, and 50.0 feet bgs. The samples were analyzed for metals at GEL and for radionuclides (50-foot depth interval only) by gamma spectroscopy at the SNL/NM RPSD Laboratory. Because organic vapors were detected during field-screening in one soil sample from Borehole No. 6, this sample was analyzed for VOCs at GEL.

4.4.2.3.2 Sampling Results for 58FF (Pile of Fire Bricks)

To summarize, ten metals were detected above the background levels, no HE compounds or SVOCs were detected, one VOC was detected, and one radionuclide was detected above the background levels and 2 radionuclides had MDAs above background levels. The analytical results are incorporated into the Risk Assessment for SWMUs 8 and 58 (Annex A).

Tables 4.4.2.3.2-1 and 4.4.2.3.2-2 summarize the metals analytical results for the surface and subsurface soil samples collected at SWMU 58FF. Tables 4.4.2.3.2-3 and 4.4.2.3.2-4 provide

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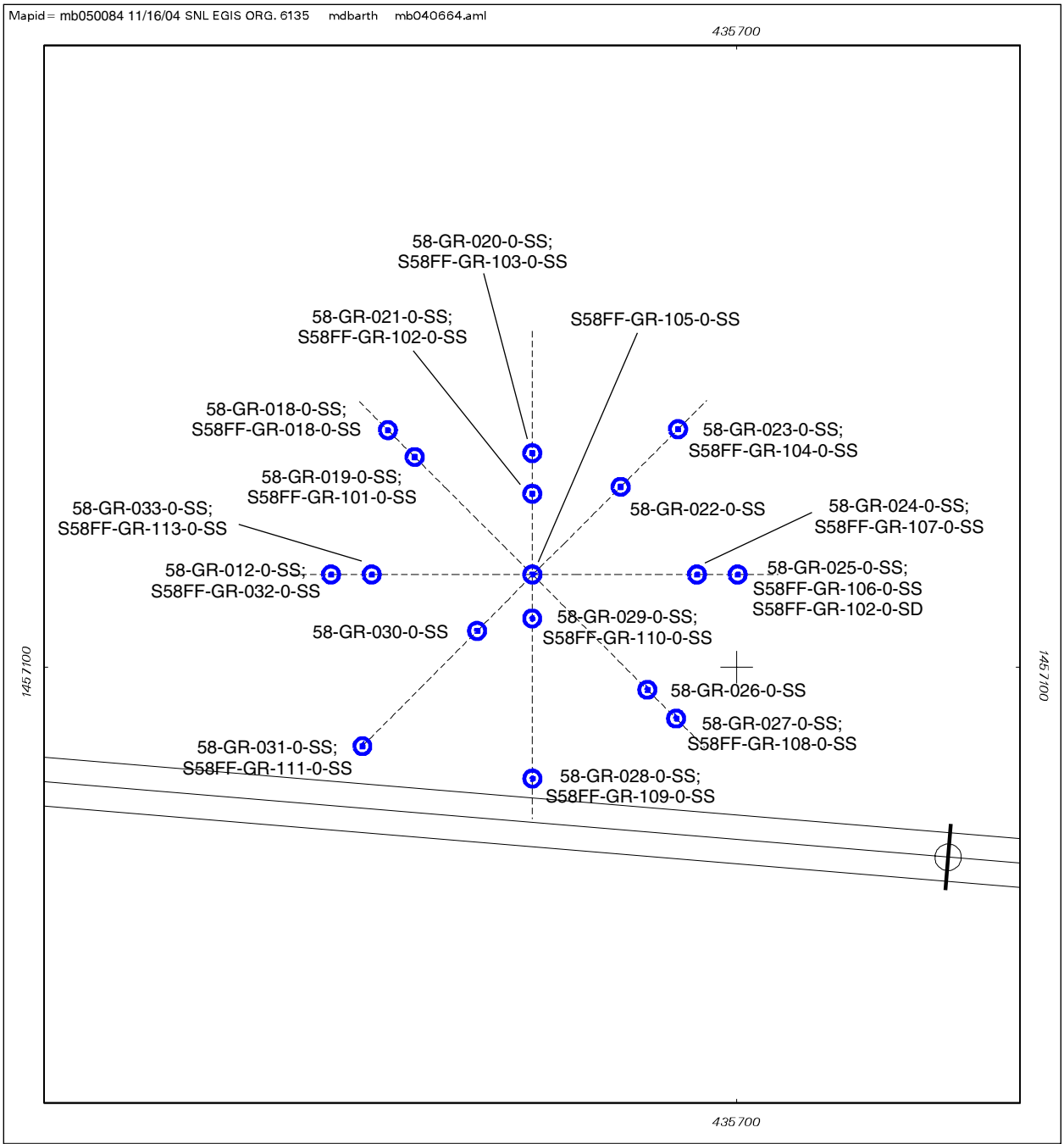

Legend

- Randomly selected sample location
- Power Pole
- Grid Line
- Power Line

Figure 4.4.2.3.1-1
Surface sample locations
at Feature 58FF

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

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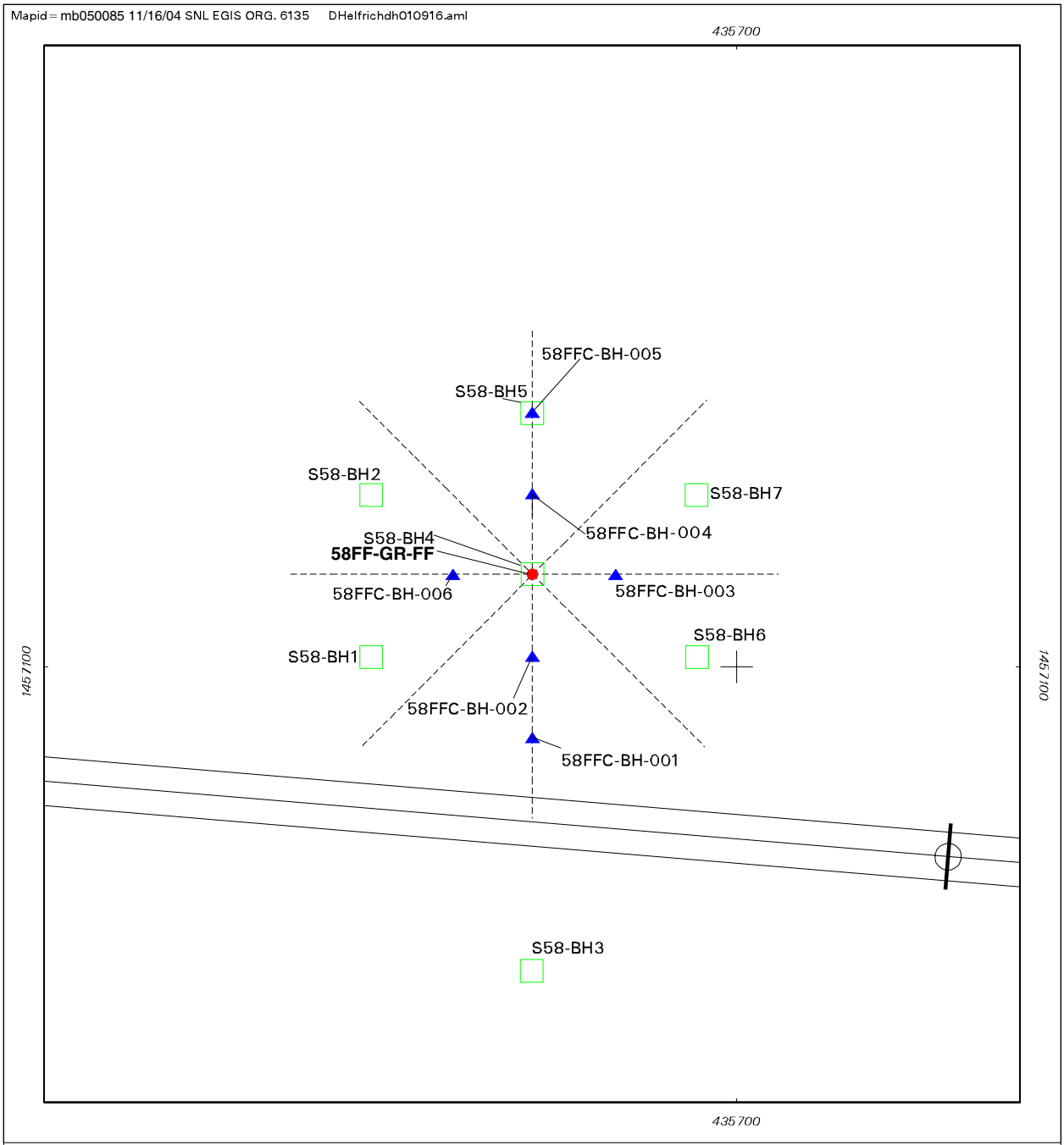

Legend

- April 96 boring location
- August 96 boring location
- April 97 boring location
- Power Pole
- Grid Line
- Power Line

Figure 4.4.2.3.1-2
Subsurface sample locations
at Feature 58FF

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

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Environmental Geographic Information System

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Table 4.4.2.3.2-1
Summary of SWMU 58, Feature 58FF RFI Surface Soil Sampling, Metals Analytical Results
June 1995 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
601330	S58FF-GR-101-0-SS	Soil	01-18-99	0–0.5	3.09	153	0.509	0.0969 J (0.463)	10.5	na
601330	S58FF-GR-102-0-SS	Soil	01-18-99	0–0.5	3.17	171	0.493	0.135 J (0.459)	10.9	na
601330	S58FF-GR-103-0-SS	Soil	01-18-99	0–0.5	2.75	167	0.441 J (0.463)	0.103 J (0.463)	9.46	na
601330	S58FF-GR-104-0-SS	Soil	01-18-99	0–0.5	2.71	191	0.440 J (0.495)	0.163 J (0.495)	7.34	na
601330	S58FF-GR-105-0-SS	Soil	01-18-99	0–0.5	4.21	154	0.530	0.122 J (0.490)	**23.7**	na
601330	S58FF-GR-106-0-SS	Soil	01-18-99	0–0.5	3.40	109	0.556	ND (0.476)	9.10	na
601330	S58FF-GR-107-0-SS	Soil	01-18-99	0–0.5	2.65	206	0.418 J (0.472)	0.127 J (0.472)	8.33	na
601330	S58FF-GR-108-0-SS	Soil	01-18-99	0–0.5	3.59	161	0.601	0.0508 J (0.459)	10.9	na
601330	S58FF-GR-109-0-SS	Soil	01-18-99	0–0.5	3.95	123	0.533	0.168 J (0.455)	9.59	na
601330	S58FF-GR-110-0-SS	Soil	01-18-99	0–0.5	4.29	177	0.596	0.279 J (0.481)	**43.5**	na
601330	S58FF-GR-111-0-SS	Soil	01-18-99	0–0.5	2.70	101	0.462 J (0.481)	0.152 J (0.481)	10.0	na
601330	S58FF-GR-112-0-SS	Soil	01-18-99	0–0.5	1.96	46.5	0.251 J (0.500)	ND (0.500)	11.5	na
601330	S58FF-GR-113-0-SS	Soil	01-18-99	0–0.5	3.45	107	0.547	0.0604 J (0.472)	16.1	na
601330	S58FF-GR-102-0-SD[c]	Soil	01-18-99	0–0.5	3.22	104	0.509	0.0430 J	9.16	na
03861	58-GR-018-0-SS	Soil	06-28-95	0–0.5	6.1	130	**ND (1.0)**	**ND (1.0)**	12	**29**
03861	58-GR-022-0-SS	Soil	06-28-95	0–0.5	2.5	93	**ND (1.0)**	**ND (1.0)**	6.9	14
03861	58-GR-026-0-SS	Soil	06-28-95	0–0.5	5.4	120	**ND (1.0)**	**ND (1.0)**	13	**18**
03861	58-GR-030-0-SS	Soil	06-28-95	0–0.5	5.8	140	**ND (1.0)**	**ND (1.0)**	13	**38**
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Refer to footnotes at end of table.

Table 4.4.2.3.2-1 (Concluded)
Summary of SWMU 58FF RFI Soil Sampling, Metals Analytical Results
June 1995 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
601330	S58FF-GR-101-0-SS	Soil	01-18-99	0–0.5	18.9	0.0181 J (0.0305)	9.36	0.839	0.123 J (0.463)	na
601330	S58FF-GR-102-0-SS	Soil	01-18-99	0–0.5	**23.0**	0.0156 J (0.0275)	9.52	0.929	0.111 J (0.459)	na
601330	S58FF-GR-103-0-SS	Soil	01-18-99	0–0.5	**23.6**	0.0148 J (0.0273)	8.18	0.672	0.0796 J (0.463)	na
601330	S58FF-GR-104-0-SS	Soil	01-18-99	0–0.5	**29.2**	0.0210 J (0.0318)	7.60	0.684	ND (0.495)	na
601330	S58FF-GR-105-0-SS	Soil	01-18-99	0–0.5	**23.8**	0.0169 J (0.0292)	11.6	0.674	0.0686 J (0.490)	na
601330	S58FF-GR-106-0-SS	Soil	01-18-99	0–0.5	9.81	0.0145 J (0.0284)	9.21	0.682	0.0748 J (0.476)	na
601330	S58FF-GR-107-0-SS	Soil	01-18-99	0–0.5	18.4	0.00546 J (0.0287)	7.50	0.736	0.0802 J (0.472)	na
601330	S58FF-GR-108-0-SS	Soil	01-18-99	0–0.5	14.3	0.00896 J (0.0316)	9.71	0.620	0.0614 J (0.459)	na
601330	S58FF-GR-109-0-SS	Soil	01-18-99	0–0.5	**56.7**	0.00813 J (0.0295)	12.0	0.731	**0.522**	na
601330	S58FF-GR-110-0-SS	Soil	01-18-99	0–0.5	**19.9**	0.00932 J (0.0299)	12.4	1.04	0.169 J (0.481)	na
601330	S58FF-GR-111-0-SS	Soil	01-18-99	0–0.5	**20.3**	0.0111 J (0.0327)	8.89	0.532	0.341 J (0.481)	na
601330	S58FF-GR-112-0-SS	Soil	01-18-99	0–0.5	7.40	0.00837 J (0.0332)	4.98	0.416 J (0.500)	ND (0.500)	na
601330	S58FF-GR-113-0-SS	Soil	01-18-99	0–0.5	1.36	0.00339 J (0.0324)	10.0	0.647	0.0798 J (0.472)	na
601330	S58FF-GR-102-0-SD[c]	Soil	01-18-99	0–0.5	9.99	ND (0.0283)	8.89	0.735	0.0614 J (0.467)	na
03861	58-GR-018-0-SS	Soil	06-28-95	0–0.5	**20**	**ND (0.10)**	13	ND (1.0)	**ND (2.0)**	39
03861	58-GR-022-0-SS	Soil	06-28-95	0–0.5	7.4	**ND (0.10)**	8.6	ND (1.0)	**ND (2.0)**	26
03861	58-GR-026-0-SS	Soil	06-28-95	0–0.5	**40**	**ND (0.10)**	13	ND (1.0)	**ND (2.0)**	42
03861	58-GR-030-0-SS	Soil	06-28-95	0–0.5	**120**	**ND (0.10)**	12	ND (1.0)	**ND (2.0)**	**53**
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Duplicate of S58FF-GR-106-0-SS.

[d]Garcia November 1988.

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
na = Not analyzed.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SD = Soil sample duplicate.
SS = Surface Soil Sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.2-2
Summary of SWMU 58, Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
April 1996 Borehole										
05073	58FF-GR-FF-5.0-6.0-SS	Soil	04-16-96	5.0–6.0	2.46	109	0.433	**0.727**	7.38	**25.4**
05073	58FF-GR-FF-10.0-11.0-SS	Soil	04-16-96	10.0–11.0	1.48	57.9	0.216 J (0.476)	0.0582 J (0.476)	5.1 J	10.2
05073	58FF-GR-FF-19.0-20.0-SS	Soil	04-16-96	19.0–20.0	2.22	132	0.329	0.609	17.1	**41.6**
August 1996 Boreholes										
05706	58FFC-BH-001-5.0-S	Soil	08-19-96	4.0–5.0	2.41	235 J	0.317 J	ND (0.005)	10.1 J	15.4 J
05706	58FFC-BH-001-10.0-S	Soil	08-19-96	9.0–10.0	2.58	103 J	0.366 J (0.0005)	ND (0.005)	12.9 J	13.1 J
05706	58FFC-BH-001-19.0-S	Soil	08-19-96	18.0–19.0	2.31	51.6 J	0.486 J (0.500)	ND (0.005)	7.16 J	7.38 J
05706	58FFC-BH-001-24.0-S	Soil	08-20-96	23.0–24.0	2.2	92.7 J	0.497	ND (0.005)	15.9 J	**17.4 J**
05706	58FFC-BH-001-29.0-S	Soil	08-20-96	28.0–29.0	**13.6**	178 J	**1.22 J**	ND (0.005)	**41.6 J**	**22.1 J**
05706	58FFC-BH-002-5.0-S	Soil	08-20-96	4.0–5.0	2.84	167 J	0.410 J (0.0005)	0.0164 J (0.005)	15.3 J	**34.6 J**
05706	58FFC-BH-002-10.0-S	Soil	08-20-96	9.0–10.0	2.33	56.8 J	0.367 J (0.0005)	ND (0.005)	10.4 J	**17.7 J**
05706	58FFC-BH-002-19.0-S	Soil	08-20-96	18.0–19.0	1.86	52.6 J	0.378 J (0.0005)	ND (0.005)	6.87 J	7.05 J
05706	58FFC-BH-002-24.0-S	Soil	08-21-96	23.0–24.0	**19.6**	46.3 J	**1.97 J**	ND (0.005)	**20.2 J**	15.8 J
05706	58FFC-BH-002-29.0-S	Soil	08-21-96	28.0–29.0	**12.3**	27.2 J	**0.936 J**	ND (0.005)	14.9 J	11.3 J
05706	58FFC-BH-003-5.0-S	Soil	08-21-96	4.0–5.0	2.86	**318 J**	0.359 J (0.005)	ND (0.005)	6.54 J	5.83 J
05706	58FFC-BH-003-10.0-S	Soil	08-21-96	9.0–10.0	1.85	33 J	0.311 J (0.0005)	ND (0.005)	12.5 J	**19.9 J**
05706	58FFC-BH-003-19.0-S	Soil	08-21-96	18.0–19.0	1.94	37.3 J	0.399 J (0.0005)	ND (0.005)	13.9 J	**18.3 J**
05706	58FFC-BH-003-24.0-S	Soil	08-26-96	23.0–24.0	**17**	**352 J**	**1.97 J**	ND (0.005)	9.1 J	14 J
05706	58FFC-BH-003-29.0-S	Soil	08-26-96	28.0–29.0	**10.2**	**585 J**	**1 J**	ND (0.005)	**91.8 J**	**29 J**
05706	58FFC-BH-004-5.0-S	Soil	08-27-96	4.0–5.0	2.94	111 J	0.328 J (0.0005)	ND (0.005)	6.11 J	5.33 J
05706	58FFC-BH-004-10.0-S	Soil	08-27-96	9.0–10.0	4.25	**411 J**	0.312 J (0.476)	ND (0.005)	12.2 J	11.8 J
05706	58FFC-BH-004-19.0-S	Soil	08-27-96	18.0–19.0	1.27	57.7 J	0.245 J (0.490)	ND (0.005)	8.49 J	10.2 J
05706	58FFC-BH-004-24.0-S	Soil	08-27-96	23.0–24.0	2.52	56 J	0.481	ND (0.005)	12.4 J	**21.4 J**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Refer to footnotes at end of table.

Table 4.4.2.3.2-2 (Continued)
Summary of SWMU 58, Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
05706	58FFC-BH-004-29.0-S	Soil	08-27-96	28.0–29.0	**11.6**	39.4 J	**1.5**	ND (0.005)	14.7 J	12.8 J
05706	58FFC-BH-005-5.0-S	Soil	08-29-96	4.0–5.0	3.43	108 J	0.355 J (0.500)	ND (0.005)	7.9 J	5.89 J
05706	58FFC-BH-005-10.0-S	Soil	08-29-96	9.0–10.0	2.46	73.4 J	0.266 J (0.500)	ND (0.005)	6.65 J	10.3 J
05706	58FFC-BH-005-19.0-S	Soil	09-04-96	18.0–19.0	1.97	42.4 J	0.426 J (0.500)	ND (0.005)	12.1 J	**18 J**
05706	58FFC-BH-005-24.0-S	Soil	09-04-96	23.0–24.0	1.8	50.2 J	0.366 J (0.500)	ND (0.005)	**25.3 J**	**24.6 J**
05706	58FFC-BH-005-24.0-SD	Soil	09-04-96	23.0–24.0	1.72	32.3 J	0.388 J (0.495)	ND (0.005)	16 J	15.6 J
05706	58FFC-BH-006-5.0-S	Soil	08-28-96	4.0–5.0	3.5	208 J	0.445 J (0.500)	ND (0.005)	14.8 J	13.7 J
05706	58FFC-BH-006-10.0-S	Soil	08-28-96	9.0–10.0	1.85	90.2 J	0.242 J (0.500)	ND (0.005)	18.6 J	**28.7 J**
05706	58FFC-BH-006-19.0-S	Soil	08-28-96	18.0–19.0	2.82	116 J	0.584	ND (0.005)	18 J	14.6 J
05706	58FFC-BH-006-24.0-S	Soil	08-28-96	23.0–24.0	2.98	45.6 J	0.659	ND (0.005)	11.5 J	**23.2 J**
05706	58FFC-BH-006-29.0-S	Soil	08-28-96	28.0–29.0	**25.2**	49.9 J	**1.56**	ND (0.005)	13.7 J	**24.9 J**
April 1997 Boreholes										
06579	S58-BH1-001-010-SA	Soil	04-10-97	10–11.0	1.43 J	102 J	0.223 J (0.467)	0.141 J (0.467)	8.5 J	**18.5 J**
06579	S58-BH1-002-020-SA	Soil	04-10-97	20–21	0.424 J	8.42 J	0.142 J (0.476)	ND (0.0105 J)	2.19 J	1.64 J
06579	S58-BH1-003-030-SA	Soil	04-10-97	30–31	**16.5 J**	25.8 J	**0.863 J**	0.0529 J (0.472)	11.8 J	12.6 J
06579	S58-BH1-004-040-SA	Soil	04-10-97	40–41	9.22 J	55.4 J	0.529 J	0.0503 J (0.500)	6.1 J	13 J
06579	S58-BH1-005-050-SA	Soil	04-10-97	50–51	**10.8 J**	24.6 J	**1.07 J**	0.155 J (0.485)	5.76 J	**18.7 J**
06579	S58-BH2-006-010-SA	Soil	04-09-97	10.0–11.0	1.81 J	184 J	0.253 J (0.495)	0.272 J (0.495)	7.62 J	9.89 J
06579	S58-BH2-007-020-SA	Soil	04-09-97	20–21	2.03 J	58.7 J	0.390 J (0.490)	0.166 J (0.490)	5.88 J	10.3 J
06579	S58-BH2-036-020-DU	Soil	04-09-97	20–21	1.91 J	28.4 J	0.371 J (0.485)	0.102 J (0.485)	9.91 J	10.1 J
06579	S58-BH2-008-030-SA	Soil	04-09-97	30–31	**103 J**	84.3 J	**3.80 J**	0.455 J (0.481)	8.95 J	**62.1 J**
06579	S58-BH2-009-040-SA	Soil	04-09-97	40–41	**11.4 J**	22.1 J	**0.920 J**	0.127 J (0.463)	9.33 J	**20.4 J**
06579	S58-BH2-010-050-SA	Soil	04-09-97	50–51	9.64 J	23.1 J	**1.01 J**	0.183 J (0.490)	7.24 J	16.9 J
06579	S58-BH3-011-010-SA	Soil	04-10-97	10.0–11.0	1.58 J	63 J	0.230 J (0.472)	ND (0.0105 J)	9.52 J	14.6 J
06579	S58-BH3-012-020-SA	Soil	04-10-97	20–21	2.81 J	28.6 J	0.463 J (0.490)	ND (0.0105 J)	8.4 J	8.57 J
06579	S58-BH3-012-020-DU[d]	Soil	04-10-97	20–21	2.24 J	33.9 J	0.424 J (0.500)	ND (0.0105 J)	7.27 J	8.21 J
06579	S58-BH3-013-033-SA	Soil	04-10-97	33	**14.6 J**	29.3 J	**1.28 J**	0.138 J (0.459)	9.13 J	**25.2 J**
06579	S58-BH3-014-040-SA	Soil	04-10-97	40–41	**18.1 J**	57.8 J	**1.88 J**	0.361 J (0.481)	**30.6 J**	**50.1 J**
06579	S58-BH3-015-050-SA	Soil	04-10-97	50–51	**26 J**	23.3 J	**0.927 J**	0.147 J (0.485)	13.7 J	**28 J**
05014	S58-BH4-016-010-SA	Soil	04-11-97	10.0–11.0	1.18	43.5	0.159 J (0.481)	ND (0.0105)	5.45 J	13
05014	S58-BH4-017-020-SA	Soil	04-11-97	20–21	1.16	25.9	0.166 J (0.500)	ND (0.0105)	3.78 J	6.46
05014	S58-BH4-018-030-SA	Soil	04-11-97	30–31	**12.6**	41.4	**1.09**	0.0226 J (0.472)	6.77 J	9.32
05014	S58-BH4-019-040-SA	Soil	04-11-97	40–41	5.46	18.1	0.474 J (0.490)	ND (0.0105)	**161 J**	**25.1**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Refer to footnotes at end of table.

Table 4.4.2.3.2-2 (Continued)
Summary of SWMU 58m Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
05014	S58-BH4-020-050-SA	Soil	04-14-97	50–51	8.89	17.1	0.692	0.0236 J (0.481)	3.21 J	12.2
06579	S58-BH5-021-010-SA	Soil	04-09-97	10.0–11.0	1.79 J	49.2 J	0.139 J (0.472)	ND (0.0105 J)	3.8 J	9.96 J
06579	S58-BH5-022-020-SA	Soil	04-09-97	20–21	1.52 J	17.7 J	0.222 J (0.459)	ND (0.0105 J)	6.57 J	8.73 J
06579	S58-BH5-023-030-SA	Soil	04-09-97	30–31	**9.87 J**	24 J	**0.935 J**	ND (0.0105 J)	8.95 J	9.79 J
06579	S58-BH5-024-044-SA	Soil	04-09-97	44–45	7.82 J	29.4 J	0.671 J	0.0546 J (0.459)	5.7 J	14.9 J
06579	S58-BH5-025-050-SA	Soil	04-09-97	50–51	**15.7 J**	30.1 J	**1.65 J**	0.248 J (0.485)	9.97 J	**29.6 J**
05014	S58-BH6-026-010-SA	Soil	04-14-97	10.0–11.0	3.53	80.4	0.431 J (0.481)	ND (0.0105)	7.06 J	8.72
05014	S58-BH6-027-020-SA	Soil	04-14-97	20–21	1.91	45.7	0.279 J (0.500)	ND (0.0105)	4.93 J	6.97
05014	S58-BH6-028-030-SA	Soil	04-14-97	30–31	8.15	36	**0.913**	0.0397 J (0.500)	14.6 J	12.1
05014	S58-BH6-029-040	Soil	04-14-97	40–41	**9.84**	25.1	0.52	ND (0.0105)	9.12 J	13.1
05014	S58-BH6-030-050-SA	Soil	04-15-97	50–51	**14.1**	22.4	**1.01**	ND (0.0105)	6.18 J	**20**
05014	S58-BH7-031-010-SA	Soil	04-15-97	10.0–11.0	ND (0.0212)	2.1	**79.3**	0.190 J (0.463)	ND (0.0105 J)	16.3
05014	S58-BH7-032-020-SA	Soil	04-15-97	20–21	ND (0.0212)	1.53	**57**	0.297 J (0.495)	ND (0.0105 J)	10.9
05014	S58-BH7-033-030-SA	Soil	04-15-97	30–31	ND (0.0212)	11.9	**24.5**	**0.875 J**	ND (0.0105 J)	11
05014	S58-BH7-034-040-SA	Soil	04-15-97	40–41	ND (0.0212)	6.89	**18.9**	0.418 J (0.490)	ND (0.0105 J)	13.2
05014	S58-BH7-035-045-SA	Soil	04-15-97	45	ND (0.0212)	6.34	**24.6**	0.394 J (0.467	ND (0.0105 J)	**30.7**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
05073	58FF-GR-FF-EB	Water	04-16-96	NA	ND (0.00276)	0.000851 J (0.0100)	ND (0.000135)	ND (0.000209)	0.00156 J (0.0100)	ND (0.00114)
05073	58FF-GR-FF-FB	Water	04-16-96	NA	ND (0.00276)	ND (0.000247)	ND (0.000135)	ND (0.000209)	ND (0.000621)	ND (0.00114)
05706	58FFC-BH-005-0.0-EB	Water	09-05-96	NA	ND (0.00186)	0.000365 J (0.0100)	0.0000323 J (0.00500)	ND (0.000097)	ND (0.000596)	0.00212 J (0.0100)
05706	58FFC-BH-005-0.0-FB	Water	09-05-96	NA	ND (0.00186)	0.000174 J (0.0100)	0.0000120 J (0.00500)	ND (0.000097)	ND (0.000596)	0.00456 J (0.0100)
06579	S58-BH7-039-FB	Water	04-10-97	NA	ND (0.00276)	0.000472 J (0.0100)	0.000312 J (0.00500)	0.000280 J (0.00500)	ND (0.000621)	0.00390 J (0.0100)
06579	S58-BH7-040-EB	Water	04-10-97	NA	ND (0.00276)	0.00646 J (0.0100)	0.000151 J (0.00500)	ND (0.000209)	0.00217 J (0.0100)	0.00158 J (0.0100)
05014	S58-BH7-038-FB	Water	04-15-97	NA	ND (0.00276)	0.000467 J (0.0100)	ND (0.000135)	0.000223 J (0.00500)	ND (0.000621)	ND (0.00114)
05014	S58-BH7-041-EB	Water	04-15-97	NA	ND (0.00276)	0.000428 J (0.0100)	ND (0.000135)	0.000215 J (0.00500)	0.000807 J (0.0100)	ND (0.00114)

Refer to footnotes at end of table.

Table 4.4.2.3.2-2 (Continued)
Summary of SWMU 58, Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
April 1996 Borehole										
05073	58FF-GR-FF-5.0-6.0-SS	Soil	04-16-96	5.0–6.0	**15,000**	ANP	**19.1 J**	1.20	ND (0.124)	40.7
05073	58FF-GR-FF-10.0-11.0-SS	Soil	04-16-96	10.0–11.0	11.2	ND (0.02)	5.41 J	0.339 J (0.476)	ND (0.0212)	25.8
05073	58FF-GR-FF-19.0-20.0-SS	Soil	04-16-96	19.0–20.0	**6,250**	ANP	**546 J**	0.599	ND (0.124)	36.3
August 1996 Boreholes										
05706	58FFC-BH-001-5.0-S	Soil	08-19-96	4.0–5.0	8.39	ND (0.02)	6.79 J	0.505	ND (0.124)	28.0
05706	58FFC-BH-001-10.0-S	Soil	08-19-96	9.0–10.0	6.88	ND (0.02)	14.2 J	0.716	ND (0.124)	28.2
05706	58FFC-BH-001-19.0-S	Soil	08-19-96	18.0–19.0	6.95	ND (0.02)	13.9 J	0.627	ND (0.124)	23.7
05706	58FFC-BH-001-24.0-S	Soil	08-20-96	23.0–24.0	5.13	ND (0.02)	**18.3 J**	0.774	ND (0.124)	33.2
05706	58FFC-BH-001-29.0-S	Soil	08-20-96	28.0–29.0	5.87	ND (0.02)	**631 J**	1.18	ND (0.124)	**57.4**
05706	58FFC-BH-002-5.0-S	Soil	08-20-96	4.0–5.0	**74.8**	ND (0.02)	**61.1 J**	0.576	ND (0.124)	**70.2**
05706	58FFC-BH-002-10.0-S	Soil	08-20-96	9.0–10.0	7.38	ND (0.02)	9.52 J	0.851	ND (0.124)	39.9
05706	58FFC-BH-002-19.0-S	Soil	08-20-96	18.0–19.0	6.35	**0.273 J**	5.69 J	0.352 J (0.072)	ND (0.124)	19
05706	58FFC-BH-002-24.0-S	Soil	08-21-96	23.0–24.0	6.36	ND (0.02)	**25.4 J**	0.769	ND (0.124)	**59.6**
05706	58FFC-BH-002-29.0-S	Soil	08-21-96	28.0–29.0	3.15	**0.0617 J**	**33.4 J**	0.737	ND (0.124)	42.6
05706	58FFC-BH-003-5.0-S	Soil	08-21-96	4.0–5.0	5.31	ND (0.02)	5.95	0.587	ND (0.124)	18.4
05706	58FFC-BH-003-10.0-S	Soil	08-21-96	9.0–10.0	6.21	ND (0.02)	9.33	0.788	ND (0.124)	38.4
05706	58FFC-BH-003-19.0-S	Soil	08-21-96	18.0–19.0	7.39	**0.0705 J**	9.56	0.770	ND (0.124)	37.2
05706	58FFC-BH-003-24.0-S	Soil	08-26-96	23.0–24.0	7.19	ND (0.02)	**20.6 J**	0.609	ND (0.124)	46.6
05706	58FFC-BH-003-29.0-S	Soil	08-26-96	28.0–29.0	6.21	ND (0.02)	**3,960 J**	0.747	ND (0.124)	**53.5**
05706	58FFC-BH-004-5.0-S	Soil	08-27-96	4.0–5.0	5.26	ND (0.02)	7.09	0.544	ND (0.124)	17.9
05706	58FFC-BH-004-10.0-S	Soil	08-27-96	9.0–10.0	6.24	ND (0.02)	**98.5 J**	0.430 J (0.476)	ND (0.124)	18.7
05706	58FFC-BH-004-19.0-S	Soil	08-27-96	18.0–19.0	4.95	ND (0.02)	6.75	0.453 J (0.490)	ND (0.124)	25.4
05706	58FFC-BH-004-24.0-S	Soil	08-27-96	23.0–24.0	7.8	ND (0.02)	**19.3 J**	1.09	ND (0.124)	43.2
05706	58FFC-BH-004-29.0-S	Soil	08-27-96	28.0–29.0	6.24	ND (0.02)	**24.5 J**	0.620	ND (0.124)	**59**
05706	58FFC-BH-005-5.0-S	Soil	08-29-96	4.0–5.0	5.96	ND (0.02)	6.65	0.436 J (0.500)	ND (0.124)	19
05706	58FFC-BH-005-10.0-S	Soil	08-29-96	9.0–10.0	5.71	ND (0.02)	7.18	0.446 J (0.500)	ND (0.124)	24.7
05706	58FFC-BH-005-19.0-S	Soil	09-04-96	18.0–19.0	6.36	ND (0.02)	9.45	0.918	ND (0.124)	37.3
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1

Refer to footnotes at end of table.

Table 4.4.2.3.2-2 (Continued)
Summary of SWMU 58, Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
05706	58FFC-BH-005-24.0-S	Soil	09-04-96	23.0–24.0	8.44	ND (0.02)	12.5 J	1.06	ND (0.124)	40.9
05706	58FFC-BH-005-24.0-SD	Soil	09-04-96	23.0–24.0	6.72	ND (0.02)	10.1 J	0.935	ND (0.124)	36.9
05706	58FFC-BH-006-5.0-S	Soil	08-28-96	4.0–5.0	7.39	ND (0.02)	10.2 J	1.00	ND (0.124)	31
05706	58FFC-BH-006-10.0-S	Soil	08-28-96	9.0–10.0	6.6	ND (0.02)	14.8 J	1.28	ND (0.124)	31.4
05706	58FFC-BH-006-19.0-S	Soil	08-28-96	18.0–19.0	9.18	**0.0822 J**	12.2 J	0.978	ND (0.124)	32.9
05706	58FFC-BH-006-24.0-S	Soil	08-28-96	23.0–24.0	8.71	ND (0.02)	10.7 J	0.959	ND (0.124)	38.4
05706	58FFC-BH-006-29.0-S	Soil	08-28-96	28.0–29.0	10	ND (0.02)	**67.6**	1.14	ND (0.124)	**85.4**
April 1997 Boreholes										
06579	S58-BH1-001-010-SA	Soil	04-10-97	10–11.0	4.33 J	0.0200 (0.0313)	6.78 J	0.453 J (0.467)	ND (0.0212 J)	45.8 J
06579	S58-BH1-002-020-SA	Soil	04-10-97	20–21	2.3 J	0.0301 (0.0309)	1.87 J	ND (0.114 J)	ND (0.0212 J)	14.1 J
06579	S58-BH1-003-030-SA	Soil	04-10-97	30–31	3.72 J	0.0164 (0.0296)	**16.9 J**	ND (0.114 J)	ND (0.0212 J)	**63.5 J**
06579	S58-BH1-004-040-SA	Soil	04-10-97	40–41	7 J	0.0285 (0.0329)	15.9 J	ND (0.114 J)	ND (0.0212 J)	41.2 J
06579	S58-BH1-005-050-SA	Soil	04-10-97	50–51	7.58 J	ND (0.0167 J)	16.3 J	ND (0.114 J)	ND (0.0212 J)	45.8 J
06579	S58-BH2-006-010-SA	Soil	04-09-97	10.0–11.0	3.61 J	0.0153 (0.0292)	3.84 J	ND (0.114 J)	0.050 J (0.990)	38.3 J
06579	S58-BH2-007-020-SA	Soil	04-09-97	20–21	5.09 J	ND (0.0167 J)	6.04 J	ND (0.114 J)	ND (0.0212 J)	39.4 J
06579	S58-BH2-036-020-DU[d]	Soil	04-09-97	20–21	4.34 J	0.0375	6.64 J	ND (0.114 J)	ND (0.0212 J)	41.1 J
06579	S58-BH2-008-030-SA	Soil	04-09-97	30–31	4.65 J	0.0233 (0.0307)	**44.6 J**	ND (0.114 J)	ND (0.0212 J)	**108 J**
06579	S58-BH2-009-040-SA	Soil	04-09-97	40–41	5.78 J	0.0270 (0.0325)	12.2 J	0.337 J (0.463)	ND (0.0212 J)	**62.2 J**
06579	S58-BH2-010-050-SA	Soil	04-09-97	50–51	6.74 J	ND (0.0167 J)	15.1 J	ND (0.114 J)	ND (0.0212 J)	**61.9 J**
06579	S58-BH3-011-010-SA	Soil	04-10-97	10.0–11.0	5.21 J	ND (0.0167 J)	6.7 J	ND (0.114 J)	ND (0.0212 J)	29.9 J
06579	S58-BH3-012-020-SA	Soil	04-10-97	20–21	8.36 J	ND (0.0167 J)	7.09 J	ND (0.114 J)	ND (0.0212 J)	30.6 J
06579	S58-BH3-012-020-DU	Soil	04-10-97	20–21	5.71 J	0.0353	6.54 J	ND (0.114 J)	ND (0.0212 J)	26 J
06579	S58-BH3-013-033-SA	Soil	04-10-97	33	6.93 J	ND (0.0167 J)	**26.3 J**	0.248 J (0.459)	ND (0.0212 J)	**58 J**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1

Refer to footnotes at end of table.

Table 4.4.2.3.2-2 (Continued)
Summary of SWMU 58, Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
06579	S58-BH3-014-040-SA	Soil	04-10-97	40–41	15 J	0.0193 (0.0316)	**41.2 J**	0.495	ND (0.0212)	**96.8 J**
06579	S58-BH3-015-050-SA	Soil	04-10-97	50–51	4.55 J	0.0277 (0.0321)	**27 J**	0.657	ND (0.0212)	**53.7 J**
05014	S58-BH4-016-010-SA	Soil	04-11-97	10.0–11.0	3.24 J	ND (0.0167)	4.33	0.521	ND (0.0212)	24.3
05014	S58-BH4-017-020-SA	Soil	04-11-97	20–21	3.15 J	ND (0.0167)	3.68	ND (o.114)	ND (0.0212)	14.9
05014	S58-BH4-018-030-SA	Soil	04-11-97	30–31	4.98 J	0.0306	**22.4**	0.276 J (0.472)	ND (0.0212)	45.7
05014	S58-BH4-019-040-SA	Soil	04-11-97	40–41	6.36 J	0.0188 J (0.0289)	**25.4**	1.09	ND (0.0212)	51
05014	S58-BH4-020-050-SA	Soil	04-14-97	50–51	4.61 J	0.0208 J (0.0326)	8.8	ND (0.114)	ND (0.0212)	30
06579	S58-BH5-021-010-SA	Soil	04-09-97	10.0–11.0	2.98 J	ND (0.0167 J)	4.67 J	0.276 J (0.472)	ND (0.0212 J)	18.1 J
06579	S58-BH5-022-020-SA	Soil	04-09-97	20–21	3.81 J	ND (0.0167 J)	5.13 J	0.445 J (0.459)	ND (0.0212 J)	23 J
06579	S58-BH5-023-030-SA	Soil	04-09-97	30–31	6.6 J	0.0180 (0.0322)	**22.4 J**	0.313 J (0.500)	ND (0.0212 J)	37.1 J
06579	S58-BH5-024-044-SA	Soil	04-09-97	44–45	6.58 J	0.0195 (0.0304)	14.2 J	0.340 J (0.459)	ND (0.0212 J)	35 J
06579	S58-BH5-025-050-SA	Soil	04-09-97	50–51	10.8 J	0.0389	**32.3 J**	ND (0.114 J)	ND (0.0212 J)	**94.3 J**
05014	S58-BH6-026-010-SA	Soil	04-14-97	10.0–11.0	5.94 J	0.0219 J (0.0327)	7.35	0.523	ND (0.0212)	21.7
05014	S58-BH6-027-020-SA	Soil	04-14-97	20–21	4.19 J	ND (0.0167)	4.54	0.465 J (0.500)	ND (0.0212)	18.2
05014	S58-BH6-028-030-SA	Soil	04-14-97	30–31	5.03 J	0.0209 J (0.0314)	**27.7**	0.508	ND (0.0212)	42.1
05014	S58-BH6-029-040	Soil	04-14-97	40–41	5.74 J	0.0206 J (0.0314)	13.1	0.518	ND (0.0212)	40.8
05014	S58-BH6-030-050-SA	Soil	04-15-97	50–51	6.16 J	0.0307 J (0.0309)	11.5	0.574	ND (0.0212)	42.4
05014	S58-BH7-031-010-SA	Soil	04-15-97	10.0–11.0	7.6 J	ND (0.0167)	6.25	0.557	ND (0.0212)	21.7
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1

Refer to footnotes at end of table.

Table 4.4.2.3.2-2 (Continued)
Summary of SWMU 58, Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
05014	S58-BH7-032-020-SA	Soil	04-15-97	20–21	6.87 J	ND (0.0167)	6	0.61	ND (0.0212)	28.2
05014	S58-BH7-033-030-SA	Soil	04-15-97	30–31	5.83 J	0.0217 J (0.0310)	**16.9**	0.376 J (0.472)	ND (0.0212)	33.8
05014	S58-BH7-034-040-SA	Soil	04-15-97	40–41	4.22 J	0.0227 J (0.0289)	16.2	ND (0.114)	ND (0.0212)	30.7
05014	S58-BH7-035-045-SA	Soil	04-15-97	45	**37.6**	0.0401	**25.5**	0.56	ND (0.0212)	**74.1**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1
Quality Assurance/Quality Control Samples (mg/L)										
05073	58FF-GR-FF-EB	Water	04-16-96	NA	0.0194	ND (0.0001)	0.240	ND (0.00228)	ND (0.000424)	0.00586 J (0.0200)
05073	58FF-GR-FF-FB	Water	04-16-96	NA	ND (0.00136)	ND (0.0001)	ND (0.000996)	ND (0.00228)	0.000790 J (0.0100)	0.00215 J (0.00117)
05706	58FFC-BH-005-0.0-EB	Water	09-05-96	NA	ND (0.00113)	ND (0.0001)	0.00161 J (0.0100)	ND (0.00143)	ND (0.00249)	ND (0.0027)
05706	58FFC-BH-005-0.0-FB	Water	09-05-96	NA	ND (0.00113)	0.000134 J (0.000200)	0.000830 J (0.0100)	ND (0.00143)	ND (0.00249)	ND (0.0027)
06579	S58-BH7-039-FB	Water	04-10-97	NA	ND (0.00136)	ND (0.0001)	ND (0.000996)	ND (0.00228)	0.000924 J (0.0100)	0.00507 J (0.0200)
06579	S58-BH7-040-EB	Water	04-10-97	NA	0.00223 J (0.00500)	ND (0.0001)	.00155 J (0.0100)	ND (0.00228)	0.000635 J (0.0100)	0.0149 J (0.0200)
05014	S58-BH7-038-FB	Water	04-15-97	NA	ND (0.00136 J)	ND (0.0001)	ND (0.000996)	ND (0.00228)	0.000516 J (0.0100)	0.00387 J (0.200)
05014	S58-BH7-041-EB	Water	04-15-97	NA	0.00168 J (0.00500)	ND (0.0001)	ND (0.000996)	ND (0.00228)	ND (0.000424)	0.00506 J (0.0200)

Note: Values in **bold** exceed background values or have MDLs that exceed background values.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Garcia November 1998.

[d]S58-BH2-036-020-DU is a duplicate of S58-BH2-007-020-SA.

58FF = SWMU 58, Feature FF.
ANP = Analyses not performed.
BH = Borehole.
DU = Duplicate soil sample.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).

Table 4.4.2.3.2-2 (Concluded)
Summary of SWMU 58, Feature 58FF RFI Subsurface Soil Sampling, Metals Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

GR	= Grab sample.
ID	= Identification.
J	= Estimated concentration.
J ( )	= The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL	= Method detection limit.
mg/kg	= Milligram(s) per kilogram.
mg/L	= Milligram(s) per liter.
NA	= Not applicable.
ND ( )	= Not detected above the MDL, shown in parentheses.
NMED	= New Mexico Environment Department.
RCRA	= Resource Conservation and Recovery Act.
RFI	= RCRA Facility Investigation.
SA	= Subsurface soil sample.
S	= Soil sample.
SS	= Soil sample.
SSD	= Soil sample duplicate
SWMU	= Solid Waste Management Unit.

Table 4.4.2.3.2-3
Summary of HE Compounds Analytical MDLs for
SWMU 58, Feature 58FF RFI Soil Sampling
June 1995 and January 1999
(Off-Site Laboratories)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
m-Dinitrobenzene	4.1 (250)
2,4-Dinitrotoluene	6.2 (260)
2,6-Dinitrotoluene	6.5 (250)
2-amino-4,6-Dinitrotoluene	6.6 (250)
4-amino-2,6-Dinitrotoluene	5.5 (250)
HMX	5.3 (2200)
Nitrobenzene	5.2 (260)
m-Nitrotoluene	11 (250)
o-Nitrotoluene	7.8 (250)
p-Nitrotoluene	11 (250)
RDX	9.7 (1000)
Tetryl	7.5 (650)
sym-Trinitrobenzene	6.6 (250)
2,4,6-Trinitrotoluene	5.7 (250)

Note: The 1995 sampling detection limits are shown in parentheses.
[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.3.2-4
Summary of HE Compounds Analytical MDLs for
SWMU 58, Feature 58FF RFI Borehole Sampling
April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
m-Dinitrobenzene	80
2,4-Dinitrotoluene	80
2,6-Dinitrotoluene	80
2-amino-4,6-Dinitrotoluene	80
4-amino-2,6-Dinitrotoluene	80
HMX	240
Nitrobenzene	80
m-Nitrotoluene	80
o-Nitrotoluene	80
p-Nitrotoluene	80
RDX	240
Tetryl	160
sym-Trinitrobenzene	80
2,4,6-Trinitrotoluene	80

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro,1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Methyl-2,4,6-Trinitrophenylnitramine.

the analytical MDLs for the HE compounds for surface and subsurface samples collected at SWMU 58FF. Table 4.4.2.3.2-5 provides the analytical MDLs for the SVOCs for subsurface samples collected at SWMU 58FF. Table 4.4.2.3.2-6 summarizes the VOC analytical results and Table 4.4.2.3.2-7 provides the analytical MDLs for the VOCs for subsurface samples collected at SWMU 58FF. Tables 4.4.2.3.2-8 and 4.4.2.3.2-9 provide the gamma spectroscopy analytical results for the surface and subsurface samples collected at SWMU 58FF.

Metals

Tables 4.4.2.3.2-1 and 4.4.2.3.2-2 summarize the metals analytical results for the surface and subsurface soil samples collected at SWMU 58FF, respectively. Because surface soils were removed from the center of the site during a radiation VCM (SNL/NM September 1997), metals results from the 1995 sampling event for the center samples (Sample IDs 58FF-GR-FF-0.-1.0-SS and 58FF-GR-FF-0.-1.0-SSD) are not provided and are not pertinent to the risk assessment analysis for SWMUs 8 and 58; this RFI sample location and results are presented in Annex B, Figure B-6 and Table B-19.

The sample results for both the surface and subsurface samples are combined into one discussion, and the highest concentrations, if applicable, were used in the risk assessment analysis (Annex A). The on-site MDLs for beryllium, cadmium, mercury, and silver were above the approved background limits. The following detections were reported:

- All surface soil samples collected at SWMU 58FF contained arsenic at levels below the background limit of 9.8 mg/kg. Nineteen subsurface soil samples collected contained elevated arsenic concentrations ranging from 9.84 to 103J mg/kg.
- All surface samples collected at SWMU 58FF contained barium at levels below the background limit of 246 mg/kg. Four subsurface samples collected contained elevated barium concentrations ranging from 318J to 585J mg/kg.
- Except for the samples collected in 1995 with high MDLs, all surface samples collected at SWMU 58FF contained beryllium concentrations below the background limit of 0.75 mg/kg. Twenty-five subsurface samples collected contained elevated beryllium concentrations ranging from 0.863J to 79.3 mg/kg.
- Except for the samples collected in 1995 with high MDLs, all surface samples collected at SWMU 58FF contained cadmium at levels below the background limit of 0.64 mg/kg. Two subsurface samples collected contained elevated cadmium concentrations of 0.727 and 0.875J mg/kg.
- Two surface samples and six subsurface samples collected at SWMU 58FF contained elevated chromium levels ranging from 20.2 to 161 mg/kg, compared to a background limit of 18.8 mg/kg. The surface sample concentrations were 23.7 and 43.5 mg/kg, and the subsurface samples had elevated chromium concentrations ranging from 20.2J to 161J mg/kg.
- Three surface soil samples collected at SWMU 58FF contained elevated copper levels ranging from 18 to 38 mg/kg, compared to a background limit of 17.1 mg/kg. Twenty-six subsurface samples contained elevated copper levels ranging from 17.4J to 62.1J mg/kg.

Table 4.4.2.3.2-5
Summary of SVOC Analytical MDLs for SWMU 58,
Feature 58FF RFI Borehole Sampling
April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (μg/kg)
Acenaphthene	167
Acenaphthylene	167
Anthracene	167
Benzo (a) anthracene	167
Benzo (a) pyrene	167
Benzo (b) fluoranthene	167
Benzo (g,h,I) perylene	167
Benzo (k) fluoranthene	167
Benzoic acid	333
Benzyl alcohol	167
4-Bromophenyl–phenylether	167
Butylbenzylphthalate	167
4-Chloro-3-methylphenol	167
4-Chloroanaline	167
bis(2-chloroethoxy) methane	167
(2-Chloroethyl) ether bis	167
bis(2-Chloroisopropyl) ether	167
2-Chloronaphthalene	167
2-Chlorophenol	167
4-Chlorophenyl–phenylether	167
Chrysene	167
m,p-Cresol	167
o-Cresol	167
Dibenzo(a,h)anthracene	167
Dibenzofuran	167
1,2-Dichlorobenzene	167
1,3-Dichlorobenzene	167
1,4-Dichlorobenzene	167
3,3-Dichlorobenzidine	1670
2,4-Dichlorophenol	167
Diethylphthalate	167
2,4-Dimethylphenol	167
Dimethylphthalate	167
Di-n-butylphthalate	167
4,6-Dinitro-2-methylphenol	167
2,4–Dinitrotoluene	167
Di-n-octylphthalate	167
2,4-Dinitrophenol	333
2,6-Dinitrotoluene	167
bis(2-Ethylhexyl) phthalate	167
Fluoranthene	167
Fluorene	167
Hexachlorobenzene	167

Refer to footnotes at end of table.

Table 4.4.2.3.2-5 (Concluded)
Summary of SVOC Analytical MDLs for SWMU 58,
Feature 58FF RFI Borehole Sampling
April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (μg/kg)
Hexachlorobutadiene	167
Hexachlorocyclopentadiene	167
Hexachloroethane	167
Indeno (1,2,3-cd) pyrene	167
Isophorone	167
2-Methylnaphthalene	167
Naphthalene	167
2-Nitroaniline	167
3-Nitroaniline	167
4–Nitroaniline	167
Nitrobenzene	167
2-Nitrophenol	167
4-Nitrophenol	167
N-Nitroso-di-n-propylamine	167
N–Nitrosodiphenylamine	167
Pentachlorophenol	167
Phenanthrene	167
Phenol	167
Pyrene	167
1,2,4-Trichlorobenzene	167
2,4,5-Trichlorophenol	167
2,4,6-Trichlorophenol	167

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SVOC = Semivolatile organic compound.
SWMU= Solid Waste Management Unit.

Table 4.4.2.3.2-6
Summary of SWMU 58, Feature 58FF RFI Soil Sampling, VOC Analytical Results
June 1995 and January 1999
(On-Site and Off-Site Laboratory)

Sample Attributes					VOCs (EPA Method 8260[a]) (μg/kg)
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chloroform
601330	S58FF-GR-101-0-SS	Soil	01-18-99	0–0.5	ND (0.24)
601330	S58FF-GR-102-0-SS	Soil	01-18-99	0–0.5	ND (0.24)
601330	S58FF-GR-103-0-SS	Soil	01-18-99	0–0.5	ND (0.24)
601330	S58FF-GR-104-0-SS	Soil	01-18-99	0–0.5	ND (0.24)
601330	S58FF-GR-105-0-SS	Soil	01-18-99	0–0.5	ND (0.24)
601330	S58FF-GR-106-0-SS	Soil	01-18-99	0–0.5	ND (0.24)
601330	S58FF-GR-107-0-SS	Soil	01-19-99	0–0.5	ND (0.24)
601330	S58FF-GR-108-0-SS	Soil	01-19-99	0–0.5	ND (0.24)
601330	S58FF-GR-109-0-SS	Soil	01-19-99	0–0.5	ND (0.24)
601330	S58FF-GR-110-0-SS	Soil	01-19-99	0–0.5	ND (0.24)
601330	S58FF-GR-111-0-SS	Soil	01-19-99	0–0.5	ND (0.24)
601330	S58FF-GR-112-0-SS	Soil	01-19-99	0–0.5	ND (0.24)
601330	S58FF-GR-113-0-SS	Soil	01-19-99	0–0.5	ND (0.24)
601330	S58FF-GR-102-0-SD[c]	Soil	01-18-99	0–0.5	**0.50 J (1.00)**
03861	58-GR-018-0-SS	Soil	06-28-95	0–0.5	ND (5.0)
03861	58-GR-022-0-SS	Soil	06-28-95	0–0.5	ND (5.0)
03861	58-GR-026-0-SS	Soil	06-28-95	0–0.5	ND (5.0)
03861	58-GR-030-0-SS	Soil	06-28-95	0–0.5	ND (5.0)
Quality Assurance Samples (μg/L)					
03861	58-GR-018-EB	Water	06-28-95	NA	ND (5.0)
601330	S58-GR-101-EB	Water	01-18-99	NA	ND (1.00)
601330	S58-GR-102-EB	Water	01-19-99	NA	ND (1.00)
601330	S58-GR-104-FB	Water	01-18-99	NA	ND (1.00)
601330	S58-GR-107-TB	Water	01-19-99	NA	ND (1.00)

Note: Values in **bold** represent detected analytes.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]S58FF-GR-102-0-SD is a duplicate of S58FF-GR-106-0-SS.

EB = Equipment blank.
ER = Environmental Restoration.
EPA = U.S. Environmental Protection Agency.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58FF = SWMU 58, Feature FF
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 4.4.2.3.2-7
Summary of VOCs Analytical MDLs for SWMU 58,
Feature 58FF RFI Borehole Sampling
April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8260[a]) (μg/kg)
Acetone	2
Benzene	1
Bromodichloromethane	1
Bromoform	1
2-Butanone	2
Carbon Disulfide	2
Carbon Tetrachloride	1
Chlorobenzene	1
Chloroethane	1
Chloroform	1
Dibromochloromethane	1
1,1-Dichloroethane	1
1,2-Dichloroethane	1
cis-1,2-Dichloroethene	1
1,1-Dichloroethene	1
1,2-Dichloropropane	1
cis-1,3-Dichloropropylene	1
trans-1,3-Dichloropropylene	1
Ethylbenzene	1
2-Hexanone	2
Methyl Bromide	1
Methyl Chloride	1
4-Methyl-2-pentanone	2
Methylene Chloride	1
Styrene	1
1,1,2,2-Tetrachloroethane	1
Tetrachloroethene	1
Toluene	1
1,1,1-Trichloroethane	1
1,1,2-Trichloroethane	1
Trichloroethene	1
Vinyl Acetate	2
Vinyl Chloride	1
Xylene (Total)	3

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 4.4.2.3.2-8
Summary of SWMU 58, Feature 58FF RFI Soil Sampling, Gamma Spectroscopy Analytical Results
June 1995
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
03860	58-GR-018-0-SS	Soil	06-28-95	0–0.5	0.174	0.0510	0.870	0.299
03860	58-GR-019-0-SS	Soil	06-28-95	0–0.5	0.536	0.113	0.622	0.193
03860	58-GR-020-0-SS	Soil	06-28-95	0–0.5	0.575	0.0957	0.667	0.242
03860	58-GR-021-0-SS	Soil	06-28-95	0–0.5	0.909	0.141	0.887	0.252
03860	58-GR-022-0-SS	Soil	06-28-95	0–0.5	0.344	0.0670	0.530	0.224
03860	58-GR-023-0-SS	Soil	06-28-95	0–0.5	0.372	0.0692	0.845	0.261
03860	58-GR-024-0-SS	Soil	06-28-95	0–0.5	0.429	0.0732	0.600	0.205
03860	58-GR-025-0-SS	Soil	06-28-95	0–0.5	0.465	0.0827	0.687	0.221
03860	58-GR-026-0-SS	Soil	06-28-95	0–0.5	0.260	0.0568	0.635	0.289
03860	58-GR-027-0-SS	Soil	06-28-95	0–0.5	0.140	0.0421	0.826	0.259
03860	58-GR-028-0-SS	Soil	06-28-95	0–0.5	0.0489	0.0307	0.818	0.283
03860	58-GR-029-0-SS	Soil	06-28-95	0–0.5	0.218	0.0543	**3.76**	0.808
03860	58-GR-030-0-SS	Soil	06-28-95	0–0.5	0.162	0.0455	0.784	0.249
03860	58-GR-031-0-SS	Soil	06-28-95	0–0.5	0.195	0.0520	0.793	0.239
03860	58-GR-032-0-SS	Soil	06-28-95	0–0.5	0.336	0.0696	**1.11**	0.334
03860	58-GR-033-0-SS	Soil	06-28-95	0–0.5	1.06	0.159	**2.67**	0.612
03860	58-GR-034-0-SS	Soil	06-28-95	0–0.5	1.06	0.161	**5.37**	0.976
Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA

Refer to footnotes at end of table.

Table 4.4.2.3.2-8 (Concluded)
Summary of SWMU 58, Feature 58FF RFI Soil Sampling, Gamma Spectroscopy Analytical Results
June 1995
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
03860	58-GR-018-0-SS	Soil	06-28-95	0–0.5	**ND (0.403)**	--	**ND (5.64)**	--
03860	58-GR-019-0-SS	Soil	06-28-95	0–0.5	**ND (0.406)**	--	**ND (5.67)**	--
03860	58-GR-020-0-SS	Soil	06-28-95	0–0.5	**ND (0.419)**	--	**ND (5.65)**	--
03860	58-GR-021-0-SS	Soil	06-28-95	0–0.5	**ND (0.457)**	--	**ND (6.14)**	--
03860	58-GR-022-0-SS	Soil	06-28-95	0–0.5	**ND (0.329)**	--	ND (2.14)	--
03860	58-GR-023-0-SS	Soil	06-28-95	0–0.5	**ND (0.359)**	--	**ND (2.41)**	--
03860	58-GR-024-0-SS	Soil	06-28-95	0–0.5	**ND (0.323)**	--	ND (2.14)	--
03860	58-GR-025-0-SS	Soil	06-28-95	0–0.5	**ND (0.397)**	--	**ND (2.55)**	--
03860	58-GR-026-0-SS	Soil	06-28-95	0–0.5	**ND (0.348)**	--	ND (2.26)	--
03860	58-GR-027-0-SS	Soil	06-28-95	0–0.5	**ND (0.370)**	--	**ND (2.34)**	--
03860	58-GR-028-0-SS	Soil	06-28-95	0–0.5	**ND (0.337)**	--	**ND (2.42)**	--
03860	58-GR-029-0-SS	Soil	06-28-95	0–0.5	**ND (0.551)**	--	**ND (3.59)**	--
03860	58-GR-030-0-SS	Soil	06-28-95	0–0.5	**ND (0.356)**	--	ND (2.27)	--
03860	58-GR-031-0-SS	Soil	06-28-95	0–0.5	**ND (0.352)**	--	ND (2.17)	--
03860	58-GR-032-0-SS	Soil	06-28-95	0–0.5	**ND (0.393)**	--	**ND (2.54)**	--
03860	58-GR-033-0-SS	Soil	06-28-95	0–0.5	**ND (0.503)**	--	**ND (3.64)**	--
03860	58-GR-034-0-SS	Soil	06-28-95	0–0.5	**ND (0.635)**	--	**2.65**	3.35
Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, to have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.3.2-9
Summary of SWMU 58, Feature 58FF RFI Borehole Gamma Spectroscopy Analytical Results
August 1996 and April 1997
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
August 1996 Boreholes								
05713	58FFC-BH-001-5.0-29.0-S	Soil	08-20-96	5.0–29.0	ND (0.0344)	--	0.526	0.339
05713	58FFC-BH-002-5.0-29.0-S	Soil	08-21-96	5.0–29.0	ND (0.0316)	--	0.566	0.284
05713	58FFC-BH-003-5.0-S	Soil	08-21-96	5.0–5.5	ND (0.0323)	--	0.644	0.490
05713	58FFC-BH-003-10.0-S	Soil	08-21-96	10.0–10.5	ND (0.0315)	--	0.577	1.07
05713	58FFC-BH-003-19.0-S	Soil	08-21-96	19.0–19.5	ND (0.0314)	--	0.547	0.276
05713	58FFC-BH-003-24.0-S	Soil	08-26-96	24.0–24.5	ND (0.0394)	--	0.694	0.348
05713	58FFC-BH-003-29.0-S	Soil	08-26-96	29.0–29.5	ND (0.0364)	--	0.653	0.338
05713	58FFC-BH-004-5.0-S	Soil	08-27-96	5.0–5.5	ND (0.0350)	--	0.633	0.368
05713	58FFC-BH-004-10.0-S	Soil	08-27-96	10.0–10.5	ND (0.0278)	--	0.550	0.290
05713	58FFC-BH-004-19.0-S	Soil	08-27-96	19.0–19.5	ND (0.0271)	--	0.531	0.263
05713	58FFC-BH-004-24.0-S	Soil	08-27-96	24.0–24.5	ND (0.0299)	--	0.576	0.283
05713	58FFC-BH-004-29.0-S	Soil	08-27-96	29.0–29.5	ND (0.0327)	--	0.807	0.643
05713	58FFC-BH-006-5.0-S	Soil	08-27-96	5.0–5.5	ND (0.0254)	--	0.466	0.317
05713	58FFC-BH-006-10.0-S	Soil	08-27-96	10.0–10.5	ND (0.0234)	--	0.478	0.931
05713	58FFC-BH-006-19.0-S	Soil	08-28-96	19.0–19.5	ND (0.0280)	--	0.561	0.341
05713	58FFC-BH-006-24.0-S	Soil	08-28-96	24.0–24.5	ND (0.0321)	--	0.562	0.285
05713	58FFC-BH-006-29.0-S	Soil	08-29-96	29.0–29.5	ND (0.0525)	--	0.821	0.433
05713	58FFC-BH-005-5.0-S	Soil	08-29-96	5.0–5.5	ND (0.0390)	--	0.657	0.355
05713	58FFC-BH-005-10.0-S	Soil	08-29-96	10.0–10.5	0.00412	0.00799	0.609	0.898
05713	58FFC-BH-005-19.0-S	Soil	09-04-96	19.0–19.5	ND (0.0296)	--	0.602	0.312
05713	58FFC-BH-005-24.0-S	Soil	09-04-96	24.0–24.5	ND (0.0299)	--	0.606	0.329
05713	58FFC-BH-005-24.0-SD	Soil	09-04-96	24.0–24.5	ND (0.0310)	--	0.528	0.584
April 1997 Boreholes								
06578	S58-BH1-005-050-SA	Soil	04-10-97	50.0–51.0	ND (0.0332)	--	0.624	0.310
06578	S58-BH2-010-050-SA	Soil	04-09-97	50.0–51.0	ND (0.0325)	--	0.686	0.336
06578	S58-BH3-015-050-SA	Soil	04-10-97	50.0–51.0	ND (0.0362)	--	0.896	0.479
06578	S58-BH4-020-050-SA	Soil	04-11-97	50.0–51.0	ND (0.0278)	--	0.670	1.30
06578	S58-BH5-025-050-SA	Soil	04-09-97	50.0–51.0	ND (0.0283)	--	0.668	0.320
06578	S58-BH6-030-050-SA	Soil	04-14-97	50.0–51.0	ND (0.0239)	--	0.803	0.404
06578	S58-BH7-035-050-SA	Soil	04-15-97	50.0–51.0	0.0503	0.0207	0.817	0.397
Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA

Refer to footnotes at end of table.

Table 4.4.2.3.2-9 (Continued)
Summary of SWMU 58, Feature 58FF RFI Borehole Gamma Spectroscopy Analytical Results
August 1996 and April 1997
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Uranium-235		Uranium-238	
					Result	Error	Result	Error
August 1996 Boreholes								
05713	58FFC-BH-001-5.0-29.0-S	Soil	08-20-96	5.0–29.0	**ND (0.168)**	--	ND (0.872)	--
05713	58FFC-BH-002-5.0-29.0-S	Soil	08-21-96	5.0–29.0	ND (0.156)	--	ND (1.14)	--
05713	58FFC-BH-003-5.0-S	Soil	08-21-96	5.0–5.5	**ND (0.161)**	--	ND (1.19)	--
05713	58FFC-BH-003-10.0-S	Soil	08-21-96	10.0–10.5	**ND (0.162)**	--	ND (1.17)	--
05713	58FFC-BH-003-19.0-S	Soil	08-21-96	19.0–19.5	ND (0.155)	--	ND (1.08)	--
05713	58FFC-BH-003-24.0-S	Soil	08-26-96	24.0–24.5	**ND (0.195)**	--	ND (1.47)	--
05713	58FFC-BH-003-29.0-S	Soil	08-26-96	29.0–29.5	**ND (0.178)**	--	ND (1.31)	--
05713	58FFC-BH-004-5.0-S	Soil	08-27-96	5.0–5.5	**ND (0.182)**	--	ND (1.32)	--
05713	58FFC-BH-004-10.0-S	Soil	08-27-96	10.0–10.5	**ND (0.191)**	--	ND (1.25)	--
05713	58FFC-BH-004-19.0-S	Soil	08-27-96	19.0–19.5	**ND (0.182)**	--	**ND (2.57)**	--
05713	58FFC-BH-004-24.0-S	Soil	08-27-96	24.0–24.5	**ND (0.197)**	--	**ND (2.90)**	--
05713	58FFC-BH-004-29.0-S	Soil	08-27-96	29.0–29.5	**ND (0.224)**	--	**ND (3.24)**	--
05713	58FFC-BH-006-5.0-S	Soil	08-27-96	5.0–5.5	**ND (0.174)**	--	**ND (2.46)**	--
05713	58FFC-BH-006-10.0-S	Soil	08-27-96	10.0–10.5	**ND (0.167)**	--	**ND (2.34)**	--
05713	58FFC-BH-006-19.0-S	Soil	08-28-96	19.0–19.5	**ND (0.196)**	--	**ND (2.72)**	--
05713	58FFC-BH-006-24.0-S	Soil	08-28-96	24.0–24.5	ND (0.157)	--	ND (1.12)	--
05713	58FFC-BH-006-29.0-S	Soil	08-29-96	29.0–29.5	**ND (0.260)**	--	ND (1.83)	--
05713	58FFC-BH-005-5.0-S	Soil	08-29-96	5.0–5.5	**ND (0.190)**	--	ND (0.851)	--
05713	58FFC-BH-005-10.0-S	Soil	08-29-96	10.0–10.5	ND (0.160)	--	ND (1.18)	--
05713	58FFC-BH-005-19.0-S	Soil	09-04-96	19.0–19.5	**ND (0.209)**	--	**ND (2.93)**	--
05713	58FFC-BH-005-24.0-S	Soil	09-04-96	24.0–24.5	**ND (0.194)**	--	**ND (2.69)**	--
05713	58FFC-BH-005-24.0-SD	Soil	09-04-96	24.0–24.5	**ND (0.206)**	--	**ND (2.90)**	--
April 1997 Boreholes								
06578	S58-BH1-005-050-SA	Soil	04-10-97	50.0–51.0	**ND (0.244)**	--	**ND (3.34)**	--
06578	S58-BH2-010-050-SA	Soil	04-09-97	50.0–51.0	**ND (0.245)**	--	**ND (3.27)**	--
06578	S58-BH3-015-050-SA	Soil	04-10-97	50.0–51.0	**ND (0.277)**	--	**ND (3.85)**	--
06580	S58-BH4-020-050-SA	Soil	04-11-97	50.0–51.0	**ND (0.216)**	--	**ND (2.83)**	--
06578	S58-BH5-025-050-SA	Soil	04-09-97	50.0–51.0	**ND (0.220)**	--	**ND (3.04)**	--
06580	S58-BH6-030-050-SA	Soil	04-14-97	50.0–51.0	**ND (0.247)**	--	**ND (3.34)**	--
06580	S58-BH7-035-050-SA	Soil	04-15-97	50.0–51.0	**ND (0.259)**	--	**ND (3.44)**	--
Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	NA

Refer to footnotes at end of table.

Table 4.4.2.3.2-9 (Concluded)
Summary of SWMU 58, Feature 58FF RFI Borehole Gamma Spectroscopy Analytical Results
August 1996 and April 1997
(On-Site Laboratory)

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.

BH = Borehole.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown n parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SD = Soil sample duplicate.
S = Soil sample.
SA = Subsurface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

- Eight surface samples and six subsurface samples collected at SWMU 58FF contained lead concentrations up to 15,000 mg/kg, compared to a background limit of 18.9 mg/kg. The surface sample concentrations ranged from 19.9 to 120 mg/kg, and the subsurface sample concentrations ranged from 37.6 to 15,000 mg/kg.

- Except for the samples collected in 1995 with high MDLs, all surface samples collected at SWMU 58FF contained mercury at levels below the background limit of 0.055 mg/kg. Four subsurface samples collected contained elevated mercury concentrations ranging from 0.0617J to 0.273J mg/kg.

- Twenty-five subsurface samples collected at SWMU 58FF contained elevated nickel levels ranging from 16.9 to 3,960J mg/kg, compared to a background limit of 16.6 mg/kg.

- All surface and subsurface samples collected at SWMU 58FF contained selenium at levels below the background concentration of 2.7 mg/kg.

- Except for the samples collected in 1995 with high MDLs, all subsurface samples collected at SWMU 58FF contained silver at levels below the background limit of 0.50 mg/kg. One surface sample collected contained a silver concentration of 0.522 mg/kg, above the background limit of 0.50 mg/kg.

- One surface soil sample collected at SWMU 58FF contained a zinc concentration of 53 mg/kg, above the background limit of 52.1 mg/kg. Fifteen subsurface samples collected contained elevated zinc concentrations ranging from 53.5 to 108J mg/kg.

HE Compounds

Surface and subsurface soil samples were collected from SWMU 58FF and analyzed for HE compounds. The surface sample locations are exactly the same locations where samples were collected for metals/radionuclides analyses.

No HE compounds were detected in any of the soil samples collected from SWMU 58FF. Tables 4.4.2.3.2-3 and 4.4.2.3.2-4 provide the MDLs for the HE compound analyses for surface and subsurface samples collected at SWMU 58FF.

Organic Compounds

No SVOCs were detected in any of the soil samples collected from SWMU 58FF. Table 4.4.2.3.2-5 provides the MDLs for the SVOCs investigated at SWMU 58FF.

Table 4.4.2.3.2-6 summarizes the VOC analytical results for the surface and subsurface soil samples collected at SWMU 58FF. Except for one sample (S58FF-GR-102-0-SD [Figure 4.4.2.3.1-1]) with an elevated concentration of chloroform at 0.50J μg/kg, no VOCs were detected in any of the soil samples collected from SWMU 58FF. Table 4.4.2.3.2-7 provides the MDLs for the VOCs investigated at SWMU 58FF.

Radionuclides

Forty-six soil samples were collected from SWMU 58FF and analyzed for radionuclides by gamma spectroscopy. The sample locations are exactly the same locations where samples were collected for metals analyses, as shown in Figures 4.4.2.3.1-1. In addition, a sample was collected from the bottom of all seven boreholes advanced in April 1997 (Figure 4.4.2.3.1-2). Tables 4.4.2.3.2-8 and 4.4.2.3.2-9 summarize the off-site gamma spectroscopy analysis results for the RFI surface and subsurface soil samples collected at SWMU 58FF. The following detections were reported:

- One sample contained uranium-238 at an activity of 2.65 pCi/g, above the background limit of 2.31 pCi/g. Except for samples with MDAs above the background limit, all other samples collected contained uranium-238 at activities below the background limit.
- Four samples contained thorium-232 at activities above the background limit of 1.03 pCi/g, ranging from 1.11 to 5.37 pCi/g.
- All but four sample results for uranium-235 had MDAs above the background limit of 0.16 pCi/g. The MDAs above background ranged from 0.161 to 0.635 pCi/g.
- All cesium-137 activities were below the background limit of 1.55 pCi/g.

Annex C provides the gamma spectroscopy results for the samples collected at SWMU 58.

4.4.2.3.2.1 Data Quality Results for SWMUs 58FF (Pile of Fire Bricks)

QA/QC field samples collected as part of the surface and subsurface soil sampling event at SWMU 58FF included four duplicates, four FB/EB, and one TB sample.

The EB samples were analyzed off site for metals, VOCs, SVOCs, TPH, and HE compounds. Metal concentrations were slightly greater than the MDLs in one or more samples for barium, beryllium, cadmium, chromium, lead, copper, nickel, silver, and zinc. With the exception of lead and nickel, the ER concentrations were below the PQL, and the results were qualified as J (estimated). No SVOCs, TPH, or HE compounds were detected in the EB samples. Acetone and methylene chloride were detected at a J (estimated) value. No QA/QC samples were collected for radionuclide analyses.

The FB samples were analyzed off site for metals, VOCs, SVOCs, TPH, and HE compounds. Metal concentrations were slightly greater than the MDLs in one or more samples for barium, beryllium, cadmium, copper, mercury, nickel, silver, and zinc. The concentrations of barium, beryllium, cadmium, copper, mercury, nickel, silver, and zinc were below the PQL, and the results were qualified as J (estimated). No SVOCs, TPH, or HE compounds were detected in the FB samples. Acetone and methylene chloride were detected at a J (estimated) value. No QA/QC samples were collected for radionuclide analyses.

The TB samples were analyzed off site for VOCs. Acetone and methylene chloride were detected at a J (estimated) value.

RPDs were calculated for metals detected in the primary and duplicate sample sets for SWMU 58FF. The metals analyses for the sample pairs for arsenic, barium, cadmium, chromium, lead, selenium, and zinc yielded RPDs that exceeded the acceptable RPD limit of less than 25 percent (Table 4.4.2.3.2-10). Although the RPDs presented in Table 4.4.2.3.2-10 exceed the RPD limit, the values are typical of the heterogeneous uncontaminated soil and are therefore acceptable.

Duplicate samples for analyses of VOCs, SVOCs, and HE were collected from SWMU 58FF. Primary and duplicate samples analyzed for VOCs, SVOCs, and HE compounds yielded nondetections for all samples. Therefore, RPDs were not calculated.

Data Validation Results for SWMU 58FF (Pile of Fire Bricks)

The off-site laboratory results from GEL were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For AR/COC 03871, validation qualifications were applied to the SVOC data for soil sample results. Di-n-butylphthalate was detected in the method blank, and the results were qualified as not detected in the associated samples.

For AR/COC 05014, validation qualifications were applied to the metal and VOC data for soil and aqueous sample results. Cadmium was detected in the soil method blank, and the results were qualified as estimated in the associated soil samples. Cadmium, lead, and zinc were detected in the aqueous method blank, and the results were qualified as estimated in the associated samples. The soil MS/MSD recovery for chromium was outside the QC limits, and the result was qualified as estimated. Methylene chloride was detected in the soil method blank, and the results were qualified as nondetected in the associated sample that had a concentration less than the reporting limit. VOC internal standard recovery in the soil TB was outside the QC limits, and all nondetect results were qualified as nondetect, estimated.

For AR/COC 05073, validation qualifications were applied to the metal, VOC, and HE compound data for soil and aqueous sample results. Chromium was detected in the aqueous method blank, and the results were qualified as estimated in the associated samples. Nickel was detected in the soil method blank, and the results were qualified as estimated in the associated samples. Methylene chloride was detected in the aqueous and soil VOC method blanks, and the results were qualified as not detected in the associated samples. HE surrogate recovery was outside the QC limits for the FB, and the result was qualified as nondetect, estimated.

For AR/COC 05706, validation qualifications were applied to the metal data for soil and aqueous sample results. Barium, beryllium, and mercury were detected in the aqueous method blank, and the results were qualified as estimated in the associated samples. Chromium, copper,

Table 4.4.2.3.2-10
Summary of SWMU 58, Feature 58FF Field Duplicate Relative Percent Difference Values
April 1996, August 1996, April 1997, and January 1999
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference										
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Mercury	Nickel	Lead	Selenium	Silver	Zinc
601330	S58FF-GR-106-0-SS S58FF-GR-102-0-SD	0–0.5	5.44	4.69	8.83	NC	0.66	NC	3.54	1.82	7.48	19.68	NC
5706	58FFC-BH-005-24.0-S 58FFC-BH-005-24.0-SD	23.0–24.0	4.55	43.39	5.84	NC	45.04	NC	21.24	22.69	12.53	NC	10.28
6579	S58-BH2-007-020-SA S58-BH2-036-020-DU	20.0–21.0	6.09	69.58	4.99	47.76	51.04	NC	9.46	15.91	NC	NC	4.22
6579	S58-BH3-012-020-SA S58-BH3-012-020-DU	20.0–21.0	22.57	16.96	8.79	NC	14.42	NC	NC	37.67	NC	NC	16.25

[a]Analysis request/chain-of-custody record.
DU = Duplicate sample.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NC = Not calculated for nondetect results or laboratory estimated values.
S = Subsurface soil sample
S58FF = SWMU 58, Feature FF.
SA = Subsurface soil sample.
SD = Soil sample duplicate.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

nickel, and vanadium were outside the QC limits in the MS/MSD for one analytical batch, and the associated sample results were qualified as estimated. Mercury was detected in the FB, and the associated positive sample results were qualified as estimated.

For AR/COC 06579, validation qualifications were applied to the metal data for soil and aqueous sample results. Barium, beryllium, cadmium, lead, silver, and zinc were detected in the aqueous method blank, and the positive results were qualified as estimated. Cadmium and selenium were detected in the soil method blank, and the positive results were qualified as estimated. The MS/MSD recoveries were outside QC limits for arsenic, barium, beryllium, cadmium, chromium, lead, nickel, selenium, and zinc, and were qualified as estimated. Silver was detected in the EB, and was qualified as estimated.

For AR/COC 601310, validation qualifications were applied to the organic data for aqueous sample results. Two SVOC samples were analyzed outside the holding time and were qualified as nondetect, estimated. No MS/MSD or LCS/LCSD for field duplicate samples were analyzed for the VOC analysis, and the positive sample result was qualified as estimated. All nondetections were qualified as nondetect, estimated. TPH was detected in the method blank, and the results were qualified as nondetect.

For AR/COC 601330, validation qualifications were applied to the organic data for soil and aqueous sample results. Methylene chloride was detected in the method blank, and the results were qualified as nondetect.

4.4.2.3.3 Sampling Activities at SWMUs 58I, 58O, 58TT, 58UU, and 58VV (SWMU 58 Test Locations Involving Burn Tests)

The remaining Burn Test Locations at SWMUs 58I, 58O, 58TT, 58UU, and 58VV are discussed in this section.

SWMUs 58I and 58O

SWMU 58I involved a burn test on a simulated missile silo (Missile Trap Test). In the test, JP-4 fuel was used; no explosives or weapons were present. SWMU 58O involved a JP-4 burn test with a nuclear weapon (without fissionable material) to investigate how the explosives inside the weapon would react to a simulated accidental fire.

From April 1996 through December 1997, RFI sampling was performed at SWMUs 58I and 58O. In April 1996, 16 samples were collected at each feature at random locations along a radial pattern. A sample was also collected from beneath each of the three wooden pallets at SWMU 58I. In addition, subsurface samples were collected from the center of each feature (refusal was encountered above the second depth interval at SWMU 58I). In December 1997, six surface sample locations were resampled at each feature. Sample locations for SWMUs 58I and 58O are shown in Figures 4.4.2.3.3-1 and 4.4.2.3.3-2, respectively.

Samples from both features were analyzed for SVOCs, VOCs, and TPH. In addition, samples from SWMU 58O were analyzed for metals and HE compounds. All samples were analyzed off site at GEL and on site at ERCL.

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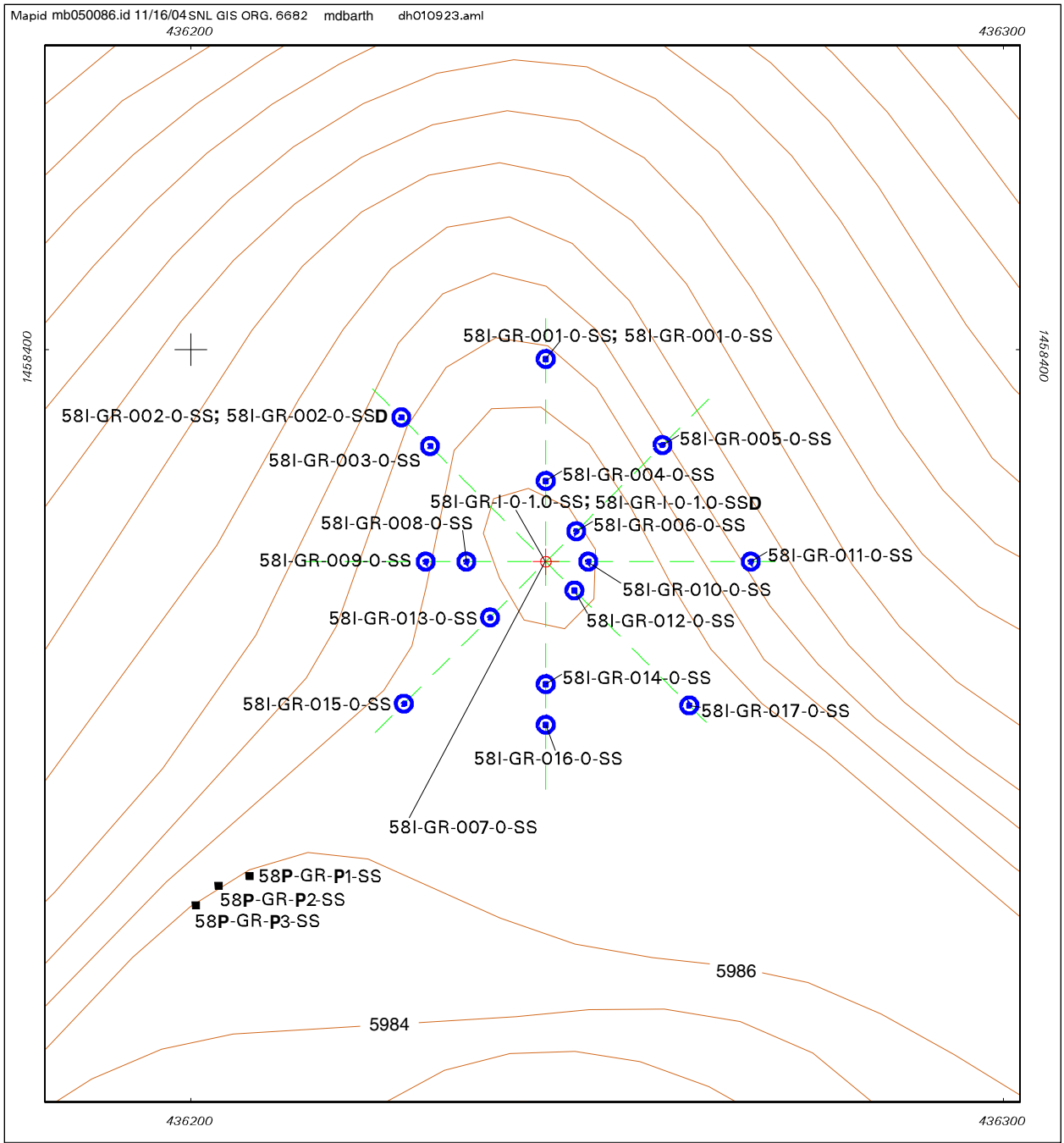

Legend

- Pallet soil sample location
- Randomly selected surface sample location
- Borehole sample location and surface sample location
- 2-Foot Contour
- Sample Grid

Figure 4.4.2.3.3-1
Surface and subsurface sample locations at Feature 58I

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

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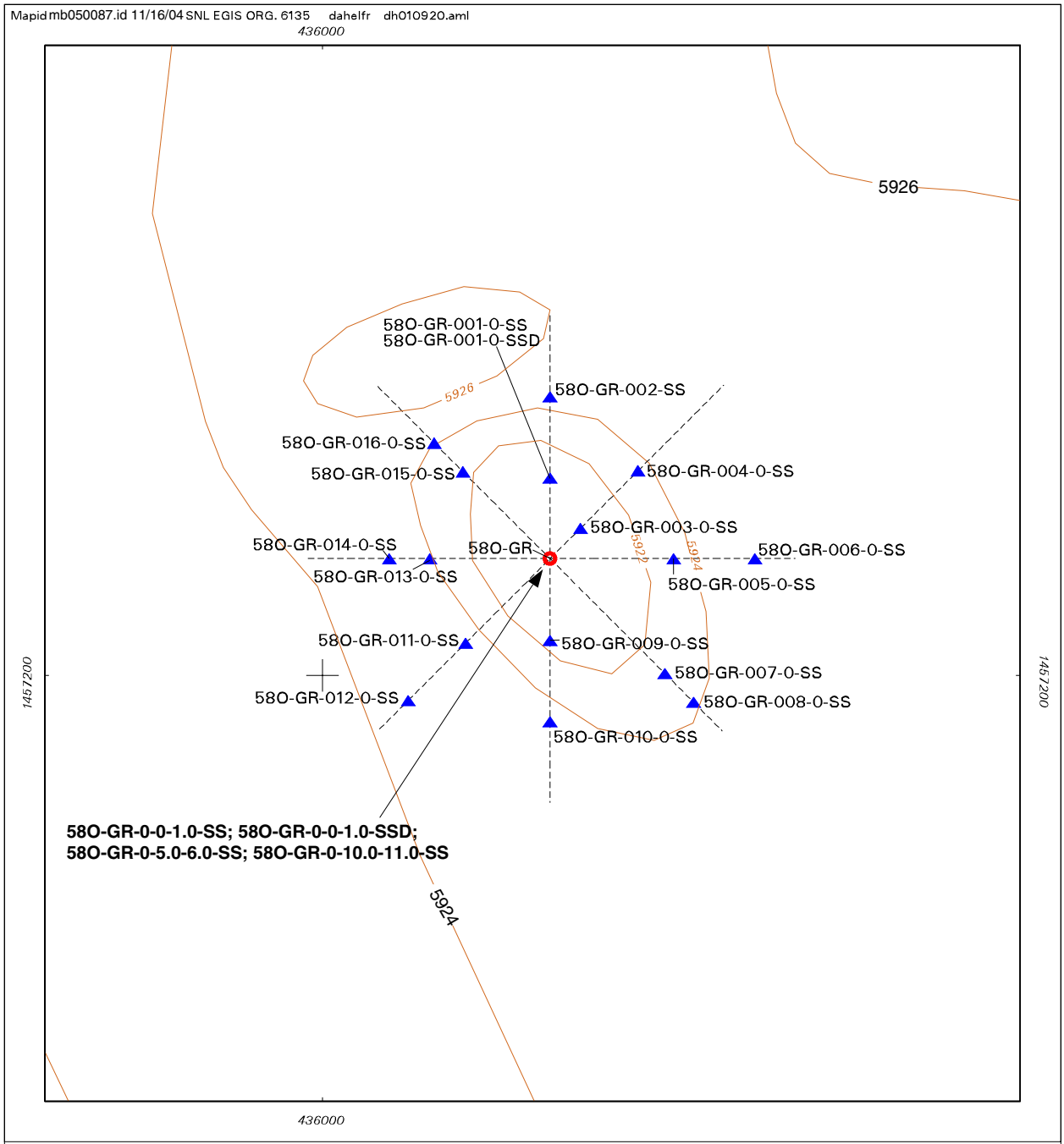

Legend

- Randomly selected surface sample location
- Borehole Sample Location and surface sample location
- Grid Line
- 2-Foot Contour

Figure 4.4.2.3.3-2
Surface and subsurface sample locations at Feature 58O

Scale in Feet: 0 10 20

Scale in Meters: 0 2.4 4.8

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SWMUs 58TT, 58UU, and 58VV

Three firebrick areas were identified and include: 1) SWMU 58TT (Firebrick Area No. 2); 2) SWMU 58UU (Firebrick Area No. 3); and 3) SWMU 58VV (Firebrick Area No. 1). These areas were not addressed in the OU 1332 RFI Work Plan (SNL/NM June 1995), but were discovered during RFI sampling activities at nearby features. The origin of the firebrick and associated debris (ACM, concrete, wire, etc.) at these features is unknown. The features were radiologically surveyed, sampled, and cleaned up during housekeeping/VCA activities conducted in 1999 and 2000. Remediation of radiologically contaminated soil at SWMU 58TT (Firebrick Area No. 2) is discussed in Section 4.5.1. Sample locations for SWMUs 58TT, 58UU, and 58VV are shown in Figures 4.4.2.3.3-3, 4.4.2.3.3-4, and 4.4.2.3.3-5, respectively.

Samples from SWMUs 58TT, 58UU, and 58VV were analyzed for metals and radionuclides. In addition, samples from SWMU 58TT were analyzed for HE compounds. All samples were analyzed for metals and HE compounds off site at GEL and for radionuclides by gamma spectroscopy on site at the SNL/NM RPSD Laboratory.

4.4.2.3.4 Sampling Results for SWMUs 58I, 58O, 58TT, 58UU, and 58VV (SWMU 58 Test Locations Involving Burn Tests)

To summarize, several metals and two radionuclides were detected above the background levels. Two VOCs, eight SVOCs, and one HE compound were detected. The analytical results are incorporated into the Risk Assessment for SWMUs 8 and 58 (Annex A).

Tables 4.4.2.3.4-1 through 4.4.2.3.4-5 summarize the metal analytical results for all the RFI soil samples collected at SWMUs 58O, 58TT, 58UU, and 58VV, respectively. Table 4.4.2.3.4-6 provides the analytical results of VOC compounds detected at SWMU 58O. Tables 4.4.2.3.4-7 and 4.4.2.3.4-8 provide the analytical MDLs for the VOC compounds detected at SWMUs 58I and 58O in surface and subsurface samples, respectively. Tables 4.4.2.3.4-9 and 4.4.2.3.4-10 provide the analytical results of SVOC compounds detected at SWMUs 58I and 58O. Tables 4.4.2.3.4-11 and 4.4.2.3.4-12 provide the analytical MDLs for the SVOC compounds detected at SWMUs 58I and 58O in surface and subsurface samples, respectively. Table 4.4.2.3.4-13 summarizes HE analytical results for all the RFI samples collected at SWMU 58O. Tables 4.4.2.3.4-14 and 4.4.2.3.4-15 provide the analytical MDLs for the HE compounds investigated at SWMUs 58O and 58TT, respectively.

Tables 4.4.2.3.4-16 through 4.4.2.3.4-18 summarize the analytical results for radionuclides by gamma spectroscopy for the soil samples collected at SWMUs 58TT, 58UU, and 58VV, respectively. The complete analytical package for all the sampling events at SWMUs 58TT, 58UU, and 58VV are provided in Annex C.

Metals

Tables 4.4.2.3.4-1 through 4.4.2.3.4-5 summarize the metal analytical results for the soil samples and duplicate samples collected at SWMUs 58O, 58TT, 58UU, and 58VV. The analytical results for SWMU 58TT are for post-VCA confirmatory samples. Because metals were not considered COCs at SWMU 58I, no metals analysis was performed for this feature.

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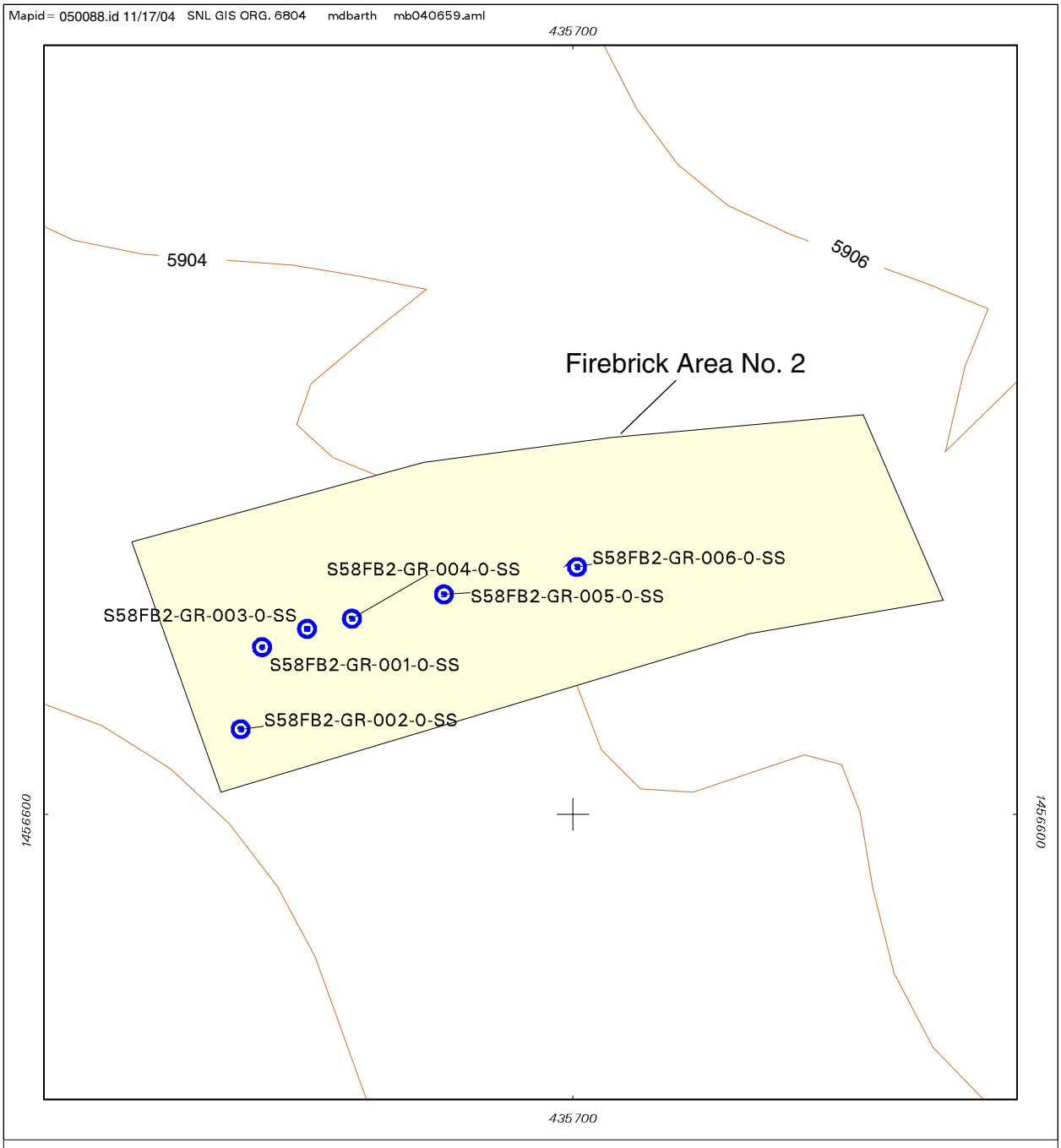

Legend

Judgmentally selected sample location

2-Foot Contour

Radiation Survey Area

Figure 4.4.2.3.3-3
Radiological Survey Area and surface sample locations at Feature 58TT (Firebrick Area No. 2)

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

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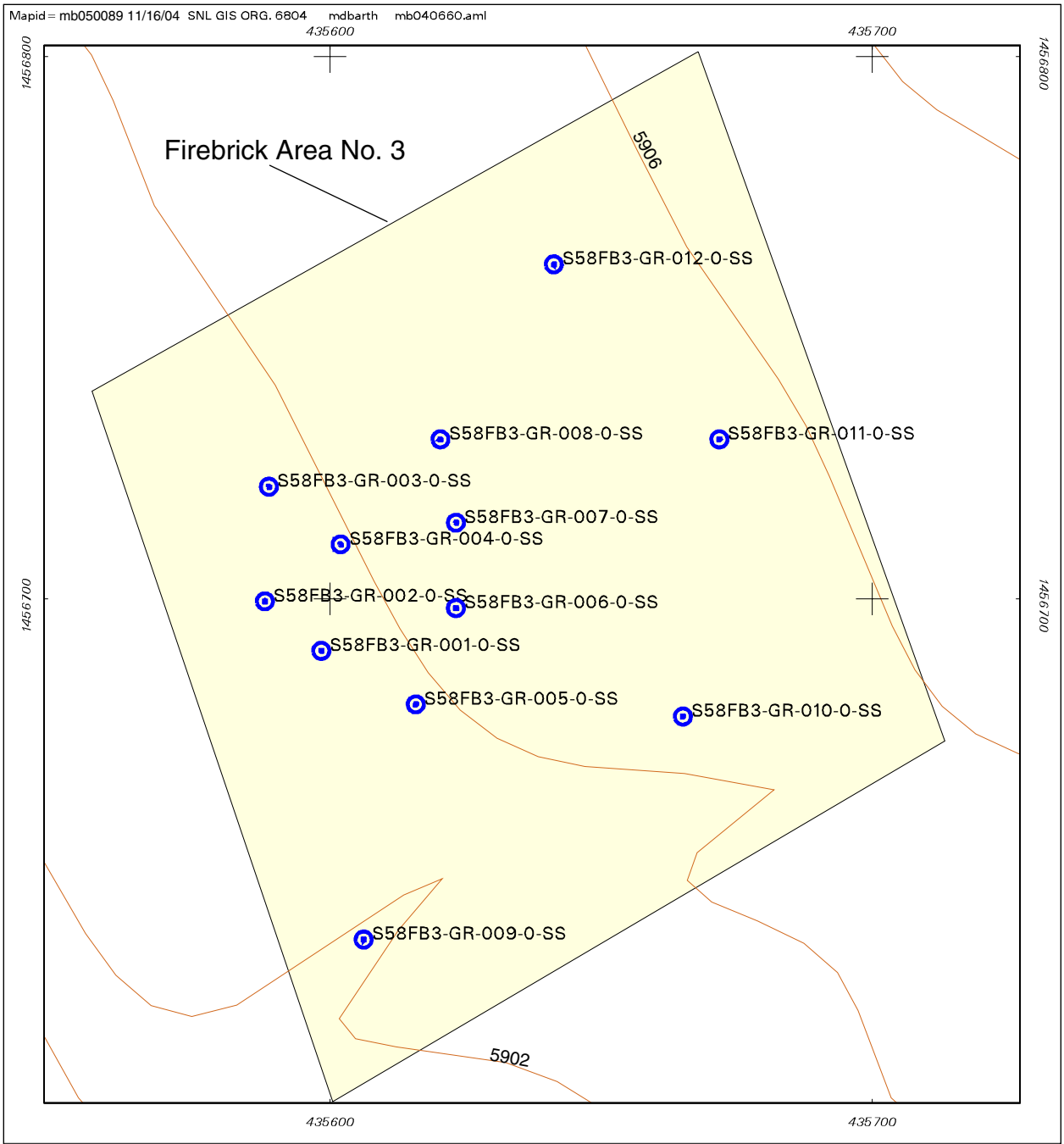

Legend

- Judgmentally selected sample location
- 2-Foot Contour
- Radiation Survey Area

Figure 4.4.2.3.3-4
Radiological Survey Area and surface sample locations at Feature 58UU
(Firebrick Area No.3)

0 15 30
Scale in Feet

0 3.6 7.2
Scale in Meters

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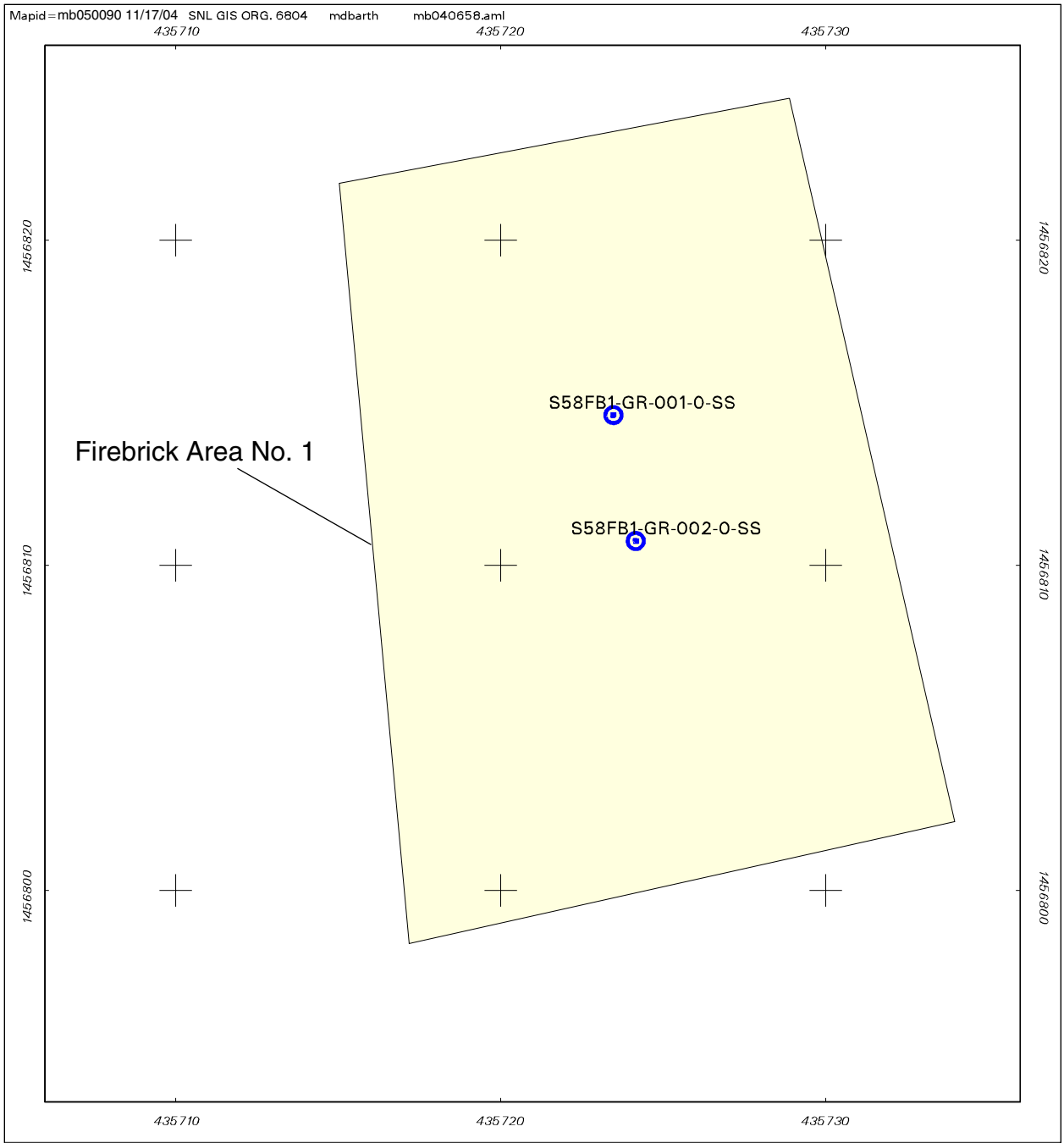

Legend

Judgmentally selected sample location

Radiation Survey Area

Figure 4.4.2.3.3-5
Radiological Survey Area and sample locations at Feature 58VV (Firebrick Area No. 1)

0 2.5 5
Scale in Feet

0 0.6 1.2
Scale in Meters

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Table 4.4.2.3.4-1
Summary of SWMU 58, Feature 58O RFI Surface Soil Sampling, Metals Analytical Results
April 1996 and December 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
510119	58O-GR-001-0-SS	Soil	12-15-97	0–0.5	2.39	134	0.372 J (0.476)	**2.49**	10.6	**22.8**
510119	58O-GR-001-0-SSD	Soil	12-15-97	0–0.5	2.19	110	0.318 J (0.459)	**2.78**	6.96	**20.2**
510119	58O-GR-002-0-SS	Soil	12-15-97	0–0.5	2.26	92.1	0.487	**1.57**	8.96	**22.2**
510119	58O-GR-003-0-SS	Soil	12-15-97	0–0.5	2.91	139	0.445 J (0.467)	**2.20**	10.9	**21.7**
05127	58O-GR-004-0-SS	Soil	04-29-96	0–0.5	3.04 J	141	0.378 J (0.5)	**2.23**	11.0	**25.2**
04960	58O-GR-005-0-SS	Soil	04-29-96	0–0.5	**ND (26)**	190	ND (0.11)	**ND (2.1)**	ND (5)	**30 J (76)**
04960	58O-GR-006-0-SS	Soil	04-29-96	0–0.5	**ND (26)**	150	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
04960	58O-GR-007-0-SS	Soil	04-29-96	0–0.5	**ND (26)**	180	ND (0.11)	**ND (2.1)**	ND (5)	**22 J (76)**
510119	58O-GR-008-0-SS	Soil	12-15-97	0–0.5	1.96	51.8	0.211 J (0.463)	ND (0.0104)	**25.4**	10.3
510119	58O-GR-009-0-SS	Soil	12-15-97	0–0.5	5.06	118	0.431 J (0.481)	**1.15**	13.5	**19.2**
04960	58O-GR-010-0-SS	Soil	04-29-96	0–0.5	**ND (26)**	130	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
04960	58O-GR-011-0-SS	Soil	04-29-96	0–0.5	**ND (26)**	110	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
510119	58O-GR-012-0-SS	Soil	12-15-97	0–0.5	2.40	166	0.428 J (0.459)	0.136 J (0.459)	12.1	15.6
04960	58O-GR-013-0-SS	Soil	04-29-96	0–0.5	**ND (26)**	110	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
04960	58O-GR-014-0-SS	Soil	04-29-96	0–0.5	**ND (26)**	120	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Refer to footnotes at end of table.

Table 4.4.2.3.4-1 (Continued)
Summary of SWMU 58, Feature 58O RFI Surface Soil Sampling, Metals Analytical Results
April 1996 and December 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
04960	58O-GR-015-0-SS	Soil	04-29-96	0–0.5	**ND (26)**	120	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05127	58O-GR-016-0-SS	Soil	04-29-96	0–0.5	3.67 J	98.4 J	0.405 J (0.00113)	ND (0.00970)	10.5	13.4
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance Samples (mg/L)										
05127	58O-GR-016-EB	Water	04-30-96	NA	ND (0.00186)	0.000684 J B (0.01)	ND (0.0000114)	ND (0.0000970)	ND (0.000596)	0.00112 J (0.01)
05127	58O-GR-016-FB	Water	04-30-96	NA	ND (0.00186)	0.000111 J (0.01)	ND (0.0000114)	ND (0.0000970)	ND (0.000596)	0.000654 J (0.01)

Refer to footnotes at end of table.

Table 4.4.2.3.4-1 (Continued)
Summary of SWMU 58, Feature 58O RFI Soil Sampling, Metals Analytical Results
April 1996 and December 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
510119	58O-GR-001-0-SS	Soil	12-15-97	0–0.5	15.3	ND (0.0173)	7.88	ND (0.07)	0.190 J (0.476)	38.9
510119	58O-GR-001-0-SSD	Soil	12-15-97	0–0.5	16.6	0.032	7.08	0.131 J (0.459)	0.224 J (0.459)	34.7
510119	58O-GR-002-0-SS	Soil	12-15-97	0–0.5	11.4	ND (0.0173)	8.43	ND (0.07)	0.248 J (0.481)	31.3
510119	58O-GR-003-0-SS	Soil	12-15-97	0–0.5	**32.4**	0.0304	9.14	ND (0.07)	0.217 J (0.467)	**71.8**
05127	58O-GR-004-0-SS	Soil	04-29-96	0–0.5	**28.4**	0.0334 J	9.14	ND (0.143)	ND (0.249)	46.8
04960	58O-GR-005-0-SS	Soil	04-29-96	0–0.5	18	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	30 J (38)
04960	58O-GR-006-0-SS	Soil	04-29-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	38
04960	58O-GR-007-0-SS	Soil	04-29-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	33 J (38)
510119	58O-GR-008-0-SS	Soil	12-15-97	0–0.5	4.55	ND (0.0173)	**17.7**	ND (0.07)	0.104 J (0.463)	31.7
05127	58O-GR-008-0-SS	Soil	04-29-96	0–0.5	9.33B	0.0211 J (0.0312)	7.76	ND (0.143)	ND (0.249)	23.6
510119	58O-GR-009-0-SS	Soil	12-15-97	0–0.5	**57.8**	0.0150 J (0.0275)	9.76	ND (0.07)	0.160 J (0.481)	**56.2**
04960	58O-GR-010-0-SS	Soil	04-29-96	0–0.5	ND (3.4)	**0.094 J (0.24)**	ND (4)	**ND (50)**	**ND (1.7)**	38
04960	58O-GR-011-0-SS	Soil	04-29-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	44
05127	58O-GR-012-0-SS	Soil	04-29-96	0–0.5	9.76B	0.0236 J (0.0332)	9.42	ND (0.143)	ND (0.249)	28.6
510119	58O-GR-012-0-SS	Soil	12-15-97	0–0.5	**28.8**	0.0308	8.44	ND (0.07)	0.112 J (0.459)	33.8
04960	58O-GR-013-0-SS	Soil	04-29-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	26 J (38)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1

Refer to footnotes at end of table.

Table 4.4.2.3.4-1 (Concluded)
Summary of SWMU 58, Feature 58O RFI Soil Sampling, Metals Analytical Results
April 1996 and December 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
04960	58O-GR-014-0-SS	Soil	04-29-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	27 J (38)
04960	58O-GR-015-0-SS	Soil	04-29-96	0–0.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	38
05127	58O-GR-016-0-SS	Soil	04-29-96	0–0.5	7.85B	0.0423	11.1	ND (0.142)	ND (0.247)	28.5
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance Samples (mg/L)										
05127	58O-GR-016-EB	Water	04-30-96	NA	ND (0.000113)	0.0000200 J (0.0002)	ND (0.000807)	ND (0.00143)	ND (0.00249)	ND (0.00270)
05127	58O-GR-016-FB	Water	04-30-96	NA	ND (0.000113)	0.0000540 J (0.0002)	ND (0.000807)	ND (0.00143)	ND (0.00249)	ND (0.00270)

Note: Values in **bold** exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

58O = SWMU 58, Feature O.
B = Analyte present in associated blank.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-2
Summary of SWMU 58, Feature 58O RFI Borehole Soil Sampling, Metals Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
05115	58O-GR-0-0-1.0-SS	Soil	04-17-96	0–1.0	3.21	**437 J**	0.127 J (0.490)	0.0656 J (0.490)	3.08 J	4.48
05115	58O-GR-0-0-1.0-SSD	Soil	04-17-96	0–1.0	3.57	**465 J**	0.134 J (0.490)	0.0664 J (0.490)	3.42 J	4.77
05115	58O-GR-0-5.0-6.0-SS	Soil	04-17-96	5.0–6.0	6.04	**988 J**	0.105 J (0.500)	0.0686 J (0.500)	4.21 J	7.85
05115	58O-GR-0-10.0-11.0-SS	Soil	04-17-96	10.0–11.0	2.13	98.4 J	0.277 J (0.500)	0.563 J (0.500)	11.8 J	8.11
NMED-Approved Background Value—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8 J	17.1
Quality Assurance Samples (mg/L)										
05115	58O-GR-0-FB	Water	04-17-96	NA	ND (1.86)	0.115 J (10)	ND (0.0114)	ND (0.0970)	ND (0.596)	ND (0.539)
05115	58O-GR-0-EB	Water	04-17-96	NA	ND (1.86)	1.45 J (10)	0.0165 J (5)	ND (0.0970)	1.46 J (10)	2.16 J (10)

Refer to footnotes at end of table.

Table 4.4.2.3.4-2 (Concluded)
Summary of SWMU 58, Feature 58O RFI Borehole Soil Sampling, Metals Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
05115	58O-GR-0-0-1.0-SS	Soil	04-17-96	0–1.0	5.80	0.0170 J (0.0324)	4.81	0.474 J (0.490)	ND (0.244)	**ND (265)**
05115	58O-GR-0-0-1.0-SSD	Soil	04-17-96	0–1.0	3.13	0.0340	4.51	0.362 J (0.490)	ND (0.244)	**ND (265)**
05115	58O-GR-0-5.0-6.0-SS	Soil	04-17-96	5.0–6.0	3.43	0.0133 J (0.032)	6.95	0.281 J (0.500)	ND (0.249)	5.08
05115	58O-GR-0-10.0-11.0-SS	Soil	04-17-96	10.0–11.0	4.45	0.00619 J (0.0288)	7.59	0.438 J (0.500)	ND (0.249)	16.70
NMED-Approved Background Value—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance Samples (mg/L)										
05115	58O-GR-0-FB	Water	04-17-96	NA	ND (1.13)	ND (0.0148)	ND (0.807)	ND (1.43)	ND (2.49)	ND (2.70)
05115	58O-GR-0-EB	Water	04-17-96	NA	ND (1.13)	ND (0.0148)	9.57 J (10)	ND (1.43)	ND (2.49)	2.99 J (20)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

580 = SWMU 58, Feature O.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Soil Sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-3
Summary of SWMU 58, Feature 58TT (Firebrick Area No. 2) VCA Confirmatory Soil Sampling, Metals Analytical Results
March 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7471/7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium
601584	S58FB2-GR-001-0-SS	Soil	03-09-99	0–0.5	2.65	94.5	0.384 J (0.463)	0.0995 J (0.463)	7.81
601584	S58FB2-GR-002-0-SS	Soil	03-09-99	0–0.5	3.18	109	0.426 J (0.490)	0.207 J (0.490)	10.2
601584	S58FB2-GR-003-0-SS	Soil	03-09-99	0–0.5	3.12	113	0.406 J (0.485)	0.110 J (0.485)	8.13
601584	S58FB2-GR-004-0-SS	Soil	03-09-99	0–0.5	2.43	131	0.378 J (0.467)	0.0630 J (0.467)	8.80
601584	S58FB2-GR-004-0-SD	Soil	03-09-99	0–0.5	2.76	128	0.400 J (0.455)	0.0561 J (0.455)	9.11
601584	S58FB2-GR-005-0-SS	Soil	03-09-99	0–0.5	2.6	142	0.403 J (0.485)	0.0620 J (0.485)	7.35
601584	S58FB2-GR-006-0-SS	Soil	03-09-99	0–0.5	2.63	150	0.422 J (0.500)	0.0424 J (0.500)	8.28
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8

Sample Attributes					Metals (EPA Methods 6010A and 7471/7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver
601584	S58FB2-GR-001-0-SS	Soil	03-09-99	0–0.5	**24.7 J**	0.00467 J (0.0314)	7.82	ND (0.135)	0.189 J (0.463)
601584	S58FB2-GR-002-0-SS	Soil	03-09-99	0–0.5	**78.8 J**	0.00749 J (0.0292)	10.1	ND (0.135)	0.189 J (0.490)
601584	S58FB2-GR-003-0-SS	Soil	03-09-99	0–0.5	**29.8 J**	0.00327 J (0.0325)	8.19	ND (0.135)	0.197 J (0.485)
601584	S58FB2-GR-004-0-SS	Soil	03-09-99	0–0.5	5.72 J	ND (0.00225)	8.14	ND (0.135)	0.218 J (0.467)
601584	S58FB2-GR-004-0-SD	Soil	03-09-99	0–0.5	5.9 J	ND (0.00225)	9.16	ND (0.135)	0.214 J (0.455)
601584	S58FB2-GR-005-0-SS	Soil	03-09-99	0–0.5	6.16 J	ND (0.00225)	7.92	ND (0.135)	0.253 J (0.485)
601584	S58FB2-GR-006-0-SS	Soil	03-09-99	0–0.5	6.09 J	ND (0.00225)	8.45	ND (0.135)	0.218 J (0.500)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9 J	0.055	16.6	2.7	<0.5

Refer to footnotes at end of table.

Table 4.4.2.3.4-3 (Concluded)
Summary of SWMU 58, Feature 58TT (Firebrick Area No. 2) VCA Confirmatory Soil Sampling, Metals Analytical Results
March 1999
(Off-Site Laboratory)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
S = Surface soil sample.
SD = Soil sample duplicate.
S58FB2 = SWMU 58 Firebrick Area No. 2.
SWMU = Solid Waste Management Unit.
VCA = Voluntary Corrective Action.

Table 4.4.2.3.4-4
Summary of SWMU 58, Feature 58UU (Firebrick Area No. 3) RFI Soil Sampling, Metals Analytical Results
January 1999 and March 2000
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Copper
601353	S58FB3-GR-001-0-SS	Soil	01-28-99	0–0.5	2.44	85.8	0.340 J (0.485)	0.276 J (0.485)	NA
601353	S58FB3-GR-002-0-SS	Soil	01-28-99	0–0.5	2.21	80.7	0.344 J 0.500)	0.387 J (0.500)	NA
601353	S58FB3-GR-003-0-SS	Soil	01-28-99	0–0.5	2.72	70.9	0.301 J (0.485)	0.366 J (0.485)	NA
601353	S58FB3-GR-004-0-SS	Soil	01-28-99	0–0.5	2.27	66.6	0.284 J (0.490)	0.447 J (0.490)	NA
603140	S58FB3-GR-005-0-SS	Soil	03-09-00	0–0.5	2.29	75.2	0.297 J (0.500)	ND (0.0382)	12.1 J
603140	S58FB3-GR-006-0-SS	Soil	03-09-00	0–0.5	2.20 J	68.6	0.271 J (0.495)	ND (0.0382)	12.1 J
603140	S58FB3-GR-007-0-SS	Soil	03-09-00	0–0.5	2.77	72.3	0.294 J (0.500)	ND (0.0382)	12.1 J
603140	S58FB3-GR-008-0-SS	Soil	03-09-00	0–0.5	3.08	89.2	0.324 J (0.495)	ND (0.0382)	12.1 J
603140	S58FB3-GR-009-0-SS	Soil	03-09-00	0–0.5	3.31	97.9	0.417 J (0.490)	ND (0.0382)	12.1 J
603140	S58FB3-GR-010-0-SS	Soil	03-09-00	0–0.5	2.79	85.2	0.362 J (0.490)	ND (0.0382)	12.1 J
603140	S58FB3-GR-011-0-SS	Soil	03-09-00	0–0.5	2.59	70.7	0.313 J (0.495)	ND (0.0382)	12.1 J
603140	S58FB3-GR-012-0-SS	Soil	03-09-00	0–0.5	2.90	79.0	0.342 J (0.472)	ND (0.0382)	12.1 J
603140	S58FB3-GR-013-0-SD[c]	Soil	03-09-00	0–0.5	3.24	98.9	0.427 J (0.500)	ND (0.0382)	12.1 J
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	9.8	246	0.75	0.64	17.1

Refer to footnotes at end of table.

Table 4.4.2.3.4-4 (Continued)
Summary of SWMU 58UU (Firebrick Area No. 3) RFI Soil Sampling, Metals Analytical Results
January 1999 and March 2000
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7471A[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
603140	S58FB3-GR-005-0-SS	Soil	03-09-00	0–0.5	**29.3**	0.0302	8.64	ND (0.146 J)	ND (0.101)	**66.5 J**
603140	S58FB3-GR-006-0-SS	Soil	03-09-00	0–0.5	8.05	0.0257 J (0.0333)	7.94	ND (0.146 J)	ND (0.101)	29.3 J
603140	S58FB3-GR-007-0-SS	Soil	03-09-00	0–0.5	8.61	0.0402	7.29	ND (0.146 J)	ND (0.101)	28.6 J
603140	S58FB3-GR-008-0-SS	Soil	03-09-00	0–0.5	6.53	ND (0.0152)	8.58	ND (0.146 J)	ND (0.101)	29.9 J
603140	S58FB3-GR-009-0-SS	Soil	03-09-00	0–0.5	7.03	0.0457	9.10	ND (0.146 J)	ND (0.101)	33.1 J
603140	S58FB3-GR-010-0-SS	Soil	03-09-00	0–0.5	9.31	ND (0.0152)	9.18	ND (0.146 J)	ND (0.101)	35.5 J
603140	S58FB3-GR-011-0-SS	Soil	03-09-00	0–0.5	7.54	**0.0844**	8.76	ND (0.146 J)	ND (0.101)	33.8 J
603140	S58FB3-GR-012-0-SS	Soil	03-09-00	0–0.5	8.62	0.032	8.42	ND (0.146 J)	ND (0.101)	31.5 J
603140	S58FB3-GR-013-0-SD[c]	Soil	03-09-00	0–0.5	7.57	ND (0.0152)	10.1	ND (0.146 J)	ND (0.101)	33.1 J
NMED-Approved Background Values—Canyon Area[d]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1 J

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]S58FB3-GR-013-0-SD is a duplicate of S58FB3-GR-009-0-SS.
[d]Garcia November 1998.

Table 4.4.2.3.4-4 (Concluded)
Summary of SWMU 58UU (Firebrick Area No. 3) RFI Soil Sampling, Metals Analytical Results
January 1999 and March 2000
(Off-Site Laboratory)

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58FB3 = SWMU 58, Firebrick Area No. 3.
SD = Surface soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-5
Summary of SWMU 58, Feature 58VV (Firebrick Area No. 1) RFI Soil Sampling, Metals Analytical Results
January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Copper
601308	S58FB1-GR-001-0-SS	Soil	01-25-99	0–0.5	2.71	78.9	0.352 J (0.500)	0.0888 J (0.500)	12.1 J
601308	S58FB1-GR-002-0-SS	Soil	01-25-99	0–0.5	2.48	77.3	0.309 J (0.467)	0.0688 J (0.467)	na
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	17.1

Sample Attributes					Metals (EPA Methods 6010A and 7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver
601308	S58FB1-GR-001-0-SS	Soil	01-25-99	0–0.5	9.52	0.0111 J (0.0304)	7.45	0.758	ND (0.031)
601308	S58FB1-GR-002-0-SS	Soil	01-25-99	0–0.5	9.30	0.00980 J (0.0259)	8.46	0.622	ND (0.031)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
na = Not analyzed.
ND ( ) = Not detected at the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58FB1 = SWMU 58 Firebrick Area No. 1.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-6
Summary of SWMU 58, Feature 58O RFI Soil Sampling, VOC Analytical Results
April and December 1997
(On- and Off-Site Laboratories)

Sample Attributes					VOCs (EPA Method 8260[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Acetone	Toluene
510119	58O-GR-001-0-SS	Soil	12-15-97	0–0.5	ND (2)	ND (1)
510119	58O-GR-001-0-SSD	Soil	12-15-97	0–0.5	ND (2)	ND (1)
510119	58O-GR-002-0-SS	Soil	12-15-97	0–0.5	**21**	ND (1)
510119	58O-GR-003-0-SS	Soil	12-15-97	0–0.5	ND (2)	ND (1)
05127	58O-GR-004-0-SS	Soil	04-29-96	0–0.5	ND (2 J)	**4.60 J (10)**
04960	58O-GR-005-0-SS	Soil	04-29-96	0–0.5	**14 J (20)**	ND (1)
04960	58O-GR-006-0-SS	Soil	04-29-96	0–0.5	ND (5)	ND (1)
04960	58O-GR-007-0-SS	Soil	04-29-96	0–0.5	ND (5)	ND (1)
510119	58O-GR-008-0-SS	Soil	12-15-97	0–0.5	ND (2)	ND (1)
510119	58O-GR-009-0-SS	Soil	12-15-97	0–0.5	ND (2)	ND (1)
04960	58O-GR-010-0-SS	Soil	04-29-96	0–0.5	**8 J (20)**	ND (1)
04960	58O-GR-011-0-SS	Soil	04-29-96	0–0.5	ND (5)	ND (1)
510119	58O-GR-012-0-SS	Soil	12-15-97	0–0.5	ND (2)	ND (1)
04960	58O-GR-013-0-SS	Soil	04-29-96	0–0.5	ND (5)	ND (1)
04960	58O-GR-014-0-SS	Soil	04-29-96	0–0.5	ND (5)	ND (1)
04960	58O-GR-015-0-SS	Soil	04-29-96	0–0.5	ND (5)	ND (1)
04960	58O-GR-016-0-SS	Soil	04-29-96	0–0.5	ND (9)	ND (1 J)
Quality Assurance/Quality Control Samples (μg/L)						
05127	58O-GR-016-SB	Soil	04-30-96	NA	ND (5.20)[c]	ND (1)[c]
05127	58O-GR-016-TB	Water	04-30-96	NA	ND (2)	ND (1)
05127	58O-GR-016-EB	Water	04-30-96	NA	**3.11 J**	ND (1)
05127	58O-GR-016-FB	Water	04-30-96	NA	ND (2)	ND (1)

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]In μg/kg.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
μg/L = Microgram(s) per liter.
μg/kg = Microgram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected at or above the MDL in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SB = Soil blank.
SS = Soil sample.
SWMU = Solid Waste Management Unit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 4.4.2.3.4-7
Summary of VOC Analytical MDLs for SWMU 58, Features 58I and 58O
RFI Surface Soil Sampling
April 1996 and December 1997
(On- and Off-Site Laboratories)

Analyte	MDL (EPA Method 8260[a]) (μg/kg)		
	AR/COCs 05127 and 05981 (Off-Site Laboratory)	AR/COCs 510118 and 510119 (Off-Site Laboratory)	AR/COCs 4960 and 4961 (On-Site Laboratory)
Acetone	2	2	5
Benzene	1	1	1
Bromodichloromethane	1	1	1
Bromoform	1	1	5
2-Butanone	2	2	5
Carbon Disulfide	2	2	5
Carbon Tetrachloride	1	1	1
Chlorobenzene	1	1	1
Chloroethane	1	1	NR
Chloroform	1	1	1
Dibromochloromethane	1	1	1
1,1-Dichloroethane	1	1	1
1,2-Dichloroethane	1	1	1
cis-1,2-Dichloroethene	1	1	1
1,1-Dichloroethene	1	1	5
1,2-Dichloropropane	1	1	1
cis-1,3-Dichloropropylene	1	1	1
trans-1,3-Dichloropropylene	1	1	1
Ethylbenzene	1	1	1
2-Hexanone	2	2	5
Methyl Bromide	1	1	NR
Methyl Chloride	1	1	1
4-Methyl-2-pentanone	2	2	5
Methylene Chloride	1	1	1
Styrene	1	1	1
1,1,2,2-Tetrachloroethane	1	1	1
Tetrachloroethene	1	1	1
Toluene	1	1	1
1,1,1-Trichloroethane	1	1	1
1,1,2-Trichloroethane	1	1	1
Trichloroethene	1	1	1
Vinyl Acetate	2	2	2
Vinyl Chloride	1	1	5
Xylene (Total)	2	2	2

[a]EPA November 1986.
AR/COC = Analysis request/chain-of-custody record.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
NR = Not Reported.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 4.4.2.3.4-8
Summary of VOC Analytical MDLs for SWMU 58,
Features 58I and 58O RFI Subsurface Soil Sampling
April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8260[a]) for AR/COCs 05074 and 05115 (μg/kg)
Acetone	5
Benzene	1
Bromodichloromethane	1
Bromoform	1
2-Butanone	2
Carbon Disulfide	2
Carbon Tetrachloride	1
Chlorobenzene	1
Chloroethane	1
Chloroform	1
Dibromochloromethane	1
1,1-Dichloroethane	1
1,2-Dichloroethane	1
cis-1,2-Dichloroethene	1
1,1-Dichloroethene	1
1,2-Dichloropropane	1
cis-1,3-Dichloropropylene	1
trans-1,3-Dichloropropylene	1
Ethylbenzene	1
2-Hexanone	5
Methyl Bromide	1
Methyl Chloride	1
4-Methyl-2-pentanone	5
Methylene Chloride	1
Styrene	1
1,1,2,2-Tetrachloroethane	1
Tetrachloroethene	1
Toluene	1
1,1,1-Trichloroethane	1
1,1,2-Trichloroethane	1
Trichloroethene	1
Vinyl Acetate	5
Vinyl Chloride	1
Xylene (Total)	1

[a]EPA November 1986.
AR/COC = Analysis request/chain of custody.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 4.4.2.3.4-9
Summary of SWMU 58, Feature 58I RFI Soil Sampling, SVOC Analytical Results
April and May 1996
(Off-Site Laboratory)

Sample Attributes					SVOCs (EPA Method 8270[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	2,4-Dinitrotoluene	N-Nitrosodiphenylamine
05074	58I-GR-I-0-1.0-SS	Soil	04-22-96	1.0–1.5	**237 J (162)**	**253 J (162)**
05074	58I-GR-I-0-1.0-SSD	Soil	04-22-96	1.0–1.5	**197 J (164)**	**203 J (164)**
05081	58I-GR-001-0-SS	Soil	05-01-96	0–0.5	ND (167 J)	ND (167 J)
05081	58I-GR-001-0-SSD	Soil	05-01-96	0–0.5	ND (167 J)	ND (167 J)
05081	58I-GR-002-0-SS	Soil	05-01-96	0–0.5	ND (163 J)	ND (163 J)
05081	58I-GR-003-0-SS	Soil	05-01-96	0–0.5	ND (164 J)	ND (164 J)
05081	58I-GR-004-0-SS	Soil	05-01-96	0–0.5	ND (163 J)	ND (163 J)
05081	58I-GR-005-0-SS	Soil	05-01-96	0–0.5	ND (166 J)	ND (166 J)
05081	58I-GR-006-0-SS	Soil	05-01-96	0–0.5	ND (165 J)	ND (165 J)
05081	58I-GR-007-0-SS	Soil	05-01-96	0–0.5	**326 J**	ND (163 J)
05081	58I-GR-008-0-SS	Soil	05-01-96	0–0.5	ND (162 J)	ND (162 J)
05081	58I-GR-009-0-SS	Soil	05-01-96	0–0.5	ND (163 J)	ND (163 J)
05081	58I-GR-010-0-SS	Soil	05-01-96	0–0.5	ND (166 J)	ND (166 J)
05081	58I-GR-011-0-SS	Soil	05-01-96	0–0.5	ND (164 J)	ND (164 J)
05081	58I-GR-012-0-SS	Soil	05-01-96	0–0.5	ND (166 J)	ND (166 J)
05081	58I-GR-013-0-SS	Soil	05-01-96	0–0.5	ND (167 J)	ND (167 J)
05081	58I-GR-014-0-SS	Soil	05-01-96	0–0.5	ND (165 J)	ND (165 J)
05081	58I-GR-015-0-SS	Soil	05-01-96	0–0.5	ND (164 J)	ND (164 J)
05081	58I-GR-016-0-SS	Soil	05-01-96	0–0.5	ND (166 J)	ND (166 J)
05081	58P-GR-P1-SS	Soil	05-01-96	0–0.5	ND (166 J)	ND (166 J)
05081	58P-GR-P2-SS	Soil	05-01-96	0–0.5	ND (162 J)	ND (162 J)
05081	58P-GR-P3-SS	Soil	05-01-96	0–0.5	ND (166 J)	ND (166 J)
Quality Assurance/Quality Control Samples (μg/L)						
05081	58I-GR-I-EB	Water	04-22-96	NA	ND (5.0 J)	ND (5.0 J)
05081	58I-GR-I-FB	Water	04-22-96	NA	ND (5.0 J)	ND (5.0 J)
05081	58I-GR-016-FB	Water	05-01-96	NA	ND (5.0 J)	ND (5.0 J)
05081	58I-GR-016-EB	Water	05-01-96	NA	ND (5.0 J)	ND (5.0 J)

Refer to footnotes at end of table.

Table 4.4.2.3.4-9 (Concluded)
Summary of SWMU 58, Feature 58I RFI Soil Sampling, SVOC Analytical Results
April and May 1996
(Off-Site Laboratory)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986
[b]Analysis request/chain-of-custody record.
58I = SWMU 58, Feature I.
58P = SWMU 58, Wooden Pallet.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
μ/kg = Microgram(s) per kilogram.
μ/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected at or above the MDL in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Soil sample.
SSD = Soil sample duplicate.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-10
Summary of SWMU 58, Feature 58O RFI Soil Sampling, SVOC Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					SVOCs (EPA Method 8270[a]) (μg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Benzo(a) pyrene	Benzo(b) anthracene	Chrysene	2,4-Dinitrotoluene
05115	58O-GR-0-0.1.0-SS	Soil	04-17-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05115	58O-GR-0-0.1.0-SSD	Soil	04-17-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05115	58O-GR-0-5.0-6.0-SS	Soil	04-17-96	5.0–6.0	ND (164)	ND (164)	ND (164)	ND (164)
05115	58O-GR-0-10.0-11.0-SS	Soil	04-17-96	10.0–11.0	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-001-0-SS	Soil	04-29-96	0–0.5	ND (164)	ND (164)	ND (164)	ND (164)
05127	58O-GR-001-0-SSD	Soil	04-29-96	0–0.5	ND (167)	ND (167)	ND (167)	ND (167)
05127	58O-GR-002-0-SS	Soil	04-29-96	0–0.5	ND (167)	ND (167)	ND (167)	ND (167)
05127	58O-GR-003-0-SS	Soil	04-29-96	0–0.5	ND (167)	ND (167)	ND (167)	ND (167)
05127	58O-GR-004-0-SS	Soil	04-29-96	0–0.5	**235 J (166)**	**202 J (166)**	**248 J (166)**	ND (166)
05127	58O-GR-005-0-SS	Soil	04-29-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-006-0-SS	Soil	04-29-96	0–0.5	ND (165)	ND (165)	ND (165)	ND (165)
05127	58O-GR-007-0-SS	Soil	04-29-96	0–0.5	ND (167)	ND (167)	ND (167)	ND (167)
05127	58O-GR-008-0-SS	Soil	04-29-96	0–0.5	ND (165)	ND (165)	ND (165)	ND (165)
05127	58O-GR-009-0-SS	Soil	04-29-96	0–0.5	ND (164)	ND (164)	ND (164)	ND (164)
05127	58O-GR-010-0-SS	Soil	04-29-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-011-0-SS	Soil	04-29-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-012-0-SS	Soil	04-30-96	0–0.5	ND (165)	ND (165)	ND (165)	ND (165)
05127	58O-GR-013-0-SS	Soil	04-30-96	0–0.5	ND (164)	ND (164)	ND (164)	ND (164)
05127	58O-GR-014-0-SS	Soil	04-30-96	0–0.5	ND (162)	ND (162)	ND (162)	ND (162)
05127	58O-GR-015-0-SS	Soil	04-30-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-016-0-SS	Soil	04-30-96	0–0.5	ND (165)	ND (165)	ND (165)	ND (165)
Quality Assurance/Quality Control Samples (μg/L)								
05115	58O-GR-0-EB	Water	04-17-96	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
05115	58O-GR-0-FB	Water	04-17-96	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
05127	58O-GR-016-EB	Water	04-30-96	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
05127	58O-GR-016-FB	Water	04-30-96	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)

Refer to footnotes at end of table.

Table 4.4.2.3.4-10 (Concluded)
Summary of SWMU 58, Feature 58O RFI Soil Sampling, SVOC Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					SVOCs (EPA Method 8270[a]) (μg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	bis(2-Ethylhexyl) phthalate	Fluoranthene	N-Nitro-sodiphenylamine	Pyrene
05115	58O-GR-0-0.1.0-SS	Soil	04-17-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05115	58O-GR-0-0.1.0-SSD	Soil	04-17-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05115	58O-GR-0-5.0-6.0-SS	Soil	04-17-96	5.0–6.0	ND (164)	ND (164)	ND (164)	ND (164)
05115	58O-GR-0-10.0-11.0-SS	Soil	04-17-96	10.0–11.0	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-001-0-SS	Soil	04-29-96	0–0.5	ND (164)	ND (164)	ND (164)	ND (164)
05127	58O-GR-001-0-SSD	Soil	04-29-96	0–0.5	ND (167)	ND (167)	ND (167)	ND (167)
05127	58O-GR-002-0-SS	Soil	04-29-96	0–0.5	ND (167)	ND (167)	ND (167)	ND (167)
05127	58O-GR-003-0-SS	Soil	04-29-96	0–0.5	ND (167)	ND (167)	ND (167)	ND (167)
05127	58O-GR-004-0-SS	Soil	04-29-96	0–0.5	ND (166)	**278 J (166)**	ND (166)	**334 J**
05127	58O-GR-005-0-SS	Soil	04-29-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-006-0-SS	Soil	04-29-96	0–0.5	ND (165)	ND (165)	ND (165)	ND (165)
05127	58O-GR-007-0-SS	Soil	04-29-96	0–0.5	ND (167)	ND (167)	ND (167)	ND (167)
05127	58O-GR-008-0-SS	Soil	04-29-96	0–0.5	ND (165)	ND (165)	ND (165)	ND (165)
05127	58O-GR-009-0-SS	Soil	04-29-96	0–0.5	ND (164)	ND (164)	ND (164)	ND (164)
05127	58O-GR-010-0-SS	Soil	04-29-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-011-0-SS	Soil	04-29-96	0–0.5	**342 J**	ND (166)	ND (166)	ND (166)
05127	58O-GR-012-0-SS	Soil	04-30-96	0–0.5	ND (165)	ND (165)	ND (165)	ND (165)
05127	58O-GR-013-0-SS	Soil	04-30-96	0–0.5	ND (164)	ND (164)	ND (164)	ND (164)
05127	58O-GR-014-0-SS	Soil	04-30-96	0–0.5	ND (162)	ND (162)	ND (162)	ND (162)
05127	58O-GR-015-0-SS	Soil	04-30-96	0–0.5	ND (166)	ND (166)	ND (166)	ND (166)
05127	58O-GR-016-0-SS	Soil	04-30-96	0–0.5	ND (165)	ND (165)	ND (165)	ND (165)
Quality Assurance/Quality Control Samples (μg/L)								
05115	58O-GR-0-EB	Water	04-17-96	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
05115	58O-GR-0-FB	Water	04-17-96	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
05127	58O-GR-016-EB	Water	04-30-96	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
05127	58O-GR-016-FB	Water	04-30-96	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
MDL = Method detection limit.
ND ( ) = Not detected at or above the MDL in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Soil sample.
SSD = Soil sample duplicate.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-11
Summary of SVOC Analytical MDLs for SWMU 58,
Features 58I and 58O RFI Soil Sampling
April–May 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (AR/COCs 05081 and 05127) (μg/kg)
Acenaphthene	162–167
Acenaphthylene	162–167
Anthracene	162–167
Benzo(a)anthracene	162–167
Benzo(a)pyrene	162–167
Benzo(b)fluoranthene	162–167
Benzo(g,h,I)perylene	162–167
Benzo(k)fluoranthene	162–167
Benzoic acid	324–333
Benzyl alcohol	162–167
4-Bromophenyl-phenylether	162–167
Butylbenzylphthalate	162–167
4-Chloro-3-methylphenol	162–167
4-Chloroaniline	162–167
bis(2-Chloroethoxy) methane	162–167
bis(2-Chloroethyl) ether	162–167
bis(2-Chloroisopropyl) ether	162–167
2-Chloronaphthalene	162–167
2-Chlorophenol	162–167
4-Chlorophenyl-phenylether	162–167
Chrysene	162–167
m,p-Cresol	162–167
o-Cresol	162–167
Dibenzo(a,h)anthracene	162–167
Dibenzofuran	162–167
1,2-Dichlorobenzene	162–167
1,3-Dichlorobenzene	162–167
1,4-Dichlorobenzene	162–167
3,3-Dichlorobenzidine	1620–1670
2,4-Dichlorophenol	162–167
Diethylphthalate	162–167
2,4-Dimethylphenol	162–167
Dimethylphthalate	162–167
Di-n-butyl phthalate	162–167
4,6-Dinitro-2-methylphenol	162–167
2,4-Dinitrophenol	324–333
2,4-Dinitrotoluene	162–167
2,6-Dinitrotoluene	162–167
Di-n-octylphthalate	162–167
1,2-Diphenylhydrazine	162–167
bis(2-Ethylhexyl) phthalate	162–167
Fluoranthene	162–167

Refer to footnotes at end of table.

Table 4.4.2.3.4-11 (Concluded)
Summary of SVOC Analytical MDLs for SWMU 58,
Features 58I and 58O RFI Soil Sampling
April–May 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (AR/COCs 05081 and 05127) (μg/kg)
Fluorene	162–167
Hexachlorobenzene	162–167
Hexachlorobutadiene	162–167
Hexachlorocyclopentadiene	162–167
Hexachloroethane	162–167
Indeno (1,2,3-cd) pyrene	162–167
Isophorone	162–167
2-Methylnaphthalene	162–167
Naphthalene	162–167
m-Nitroaniline	162–167
o-Nitroaniline	162–167
p-Nitroaniline	162–167
Nitrobenzene	162–167
2-Nitrophenol	162–167
4-Nitrophenol	162–167
N-Nitroso-di-n-propylamine	162–167
N–Nitrosodiphenylamine	162–167
Pentachlorophenol	162–167
Phenanthrene	162–167
Phenol	162–167
Pyrene	162–167
1,2,4-Trichlorobenzene	162–167
2,4,5-Trichlorophenol	162–167
2,4,6-Trichlorophenol	162–167

[a]EPA November 1986.
AR/COC = Analysis request/chain of custody.
EPA = U.S. Environmental Protection Agency.
μg/kg = Microgram(s) per kilogram.
MDL = Method detection limit.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-12
Summary of SVOC Analytical MDLs for SWMU 58,
Features 58I and 58O RFI Borehole Soil Sampling
April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (AR/COCs 5074 and 05115) (µg/kg)
Acenaphthene	162–166
Acenaphthylene	162–166
Anthracene	162–166
Benzo(a)anthracene	162–166
Benzo(a)pyrene	162–166
Benzo(b)fluoranthene	162–166
Benzo(g,h,I)perylene	162–166
Benzo(k)fluoranthene	162–166
Benzoic acid	324–332
Benzyl alcohol	162–166
4-Bromophenyl-phenylether	162–166
Butylbenzylphthalate	162–166
4-Chloro-3-methylphenol	162–166
4-Chloroaniline	162–166
bis(2-Chloroethoxy) methane	162–166
bis(2-Chloroethyl) ether	162–166
bis(2-Chloroisopropyl) ether	162–166
2-Chloronaphthalene	162–166
2-Chlorophenol	162–166
4-Chlorophenyl-phenylether	162–166
Chrysene	162–166
m,p-Cresol	113–166
o-Cresol	119–166
Dibenzo(a,h)anthracene	162–166
Dibenzofuran	162–166
1,2-Dichlorobenzene	162–166
1,3-Dichlorobenzene	162–166
1,4-Dichlorobenzene	162–166
3,3-Dichlorobenzidine	1620–1660
2,4-Dichlorophenol	162–166
Diethylphthalate	162–166
2,4-Dimethylphenol	162–166
Dimethylphthalate	162–166
Di-n-butyl phthalate	162–166
4,6-Dinitro-2-methylphenol	162–166
2,4-Dinitrophenol	324–332
2,4-Dinitrotoluene	162–166
2,6-Dinitrotoluene	162–166
Di-n-octylphthalate	162–166
1,2-Diphenylhydrazine	162–166
bis(2-Ethylhexyl) phthalate	162–166

Refer to footnotes at end of table.

Table 4.4.2.3.4-12 (Concluded)
Summary of SVOC Analytical MDLs for SWMU 58,
Features 58I and 58O RFI Borehole Soil Sampling
April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (AR/COCs 5074 and 05115) (µg/kg)
Fluoranthene	162–166
Fluorene	162–166
Hexachlorobenzene	162–166
Hexachlorobutadiene	162–166
Hexachlorocyclopentadiene	162–166
Hexachloroethane	162–166
Indeno (1,2,3-cd) pyrene	162–166
Isophorone	162–166
2-Methylnaphthalene	162–166
Naphthalene	162–166
m-Nitroaniline	166–252
o-Nitroaniline	162–166
p-Nitroaniline	133–166
Nitrobenzene	162–166
2-Nitrophenol	162–166
4-Nitrophenol	162–166
N-Nitroso-di-n-propylamine	162–166
N-Nitrosodiphenylamine	162–166
Pentachlorophenol	162–166
Phenanthrene	162–166
Phenol	162–166
Pyrene	162–166
1,2,4-Trichlorobenzene	162–166
2,4,5-Trichlorophenol	162–166
2,4,6-Trichlorophenol	162–166

[a]EPA November 1986.
AR/COC = Analysis Request/Chain-of-Custody.
EPA = U.S. Environmental Protection Agency.
µg/kg = Microgram(s) per kilogram.
MDL = Method detection limit.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-13
Summary of SWMU 58, Feature 58O RFI Soil Sampling, HE Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					HE Residues (EPA Method 8330[a]) (μg/kg)
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	RDX
5115	58O-GR-0-0.1.0-SS	Soil	04-17-96	0–0.5	ND (240)
5115	58O-GR-0-0.1.0-SSD	Soil	04-17-96	0–0.5	ND (240)
5115	58O-GR-0-5.0-6.0-SS	Soil	04-17-96	5.0–6.0	ND (240)
5115	58O-GR-0-10.0-11.0-SS	Soil	04-17-96	10.0–11.0	ND (240)
5127	58O-GR-001-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-001-0-SSD	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-002-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-003-0-SS	Soil	04-29-96	0–0.5	**19,900 J**
5127	58O-GR-004-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-005-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-006-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-007-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-008-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-009-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-010-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-011-0-SS	Soil	04-29-96	0–0.5	ND (240)
5127	58O-GR-012-0-SS	Soil	04-30-96	0–0.5	ND (240)
5127	58O-GR-013-0-SS	Soil	04-30-96	0–0.5	ND (240)
5127	58O-GR-014-0-SS	Soil	04-30-96	0–0.5	ND (240)
5127	58O-GR-015-0-SS	Soil	04-30-96	0–0.5	ND (240)
5127	58O-GR-016-0-SS	Soil	04-30-96	0–0.5	ND (240)
Quality Assurance/Quality Control samples (μg/L)					
05115	58O-GR-0-EB	Water	04-17-96	NA	ND (0.0585)
05115	58O-GR-0-FB	Water	04-17-96	NA	ND (0.0585)
05127	58O-GR-016-EB	Water	04-30-96	NA	ND (0.0585)
05127	58O-GR-016-FB	Water	04-30-96	NA	ND (0.0585)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.

58O = SWMU 58, Feature O.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected at or above the MDL in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SS = Soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-14
Summary of HE Compounds Analytical MDLs for SWMU 58,
Feature 58O Surface and Borehole RFI Soil Sampling
April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
m-Dinitrobenzene	80.0
2,4-Dinitrotoluene	80.0
2,6-Dinitrotoluene	80.0
2-amino-4,6-Dinitrotoluene	80.0
4-amino-4,6-Dinitrotoluene	80.0
HMX	240
Nitrobenzene	80.0
m-Nitrotoluene	80.0
o-Nitrotoluene	80.0
p-Nitrotoluene	80.0
RDX	240
Tetryl	160
sym-Trinitrobenzene	80.0
2,4,6-Trinitrotoluene	80.0

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.3.4-15
Summary of HE Compounds Analytical MDLs for SWMU 58,
Feature 58TT (Firebrick Area No. 2) RFI Soil Sampling
March 1999
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
m-Dinitrobenzene	4.1
2,4-Dinitrotoluene	6.2
2,6-Dinitrotoluene	6.5
2-amino-4,6-Dinitrotoluene	6.6
4-amino-2,6-Dinitrotoluene	5.5
HMX	5.3
Nitrobenzene	5.2
m-Nitrotoluene	11
o-Nitrotoluene	7.8
p-Nitrotoluene	11
RDX	9.7
Tetryl	7.5
sym-Trinitrobenzene	6.6
2,4,6-Trinitrotoluene	5.7

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.3.4-16
Summary of SWMU 58, Feature 58TT (Firebrick Area No. 2) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
601583	S58FB2-GR-001-0-SS	Soil	03-09-99	0–0.5	0.0443	0.0293	0.723	0.416
601583	S58FB2-GR-002-0-SS	Soil	03-09-99	0–0.5	0.155	0.0586	0.865	0.392
601583	S58FB2-GR-003-0-SS	Soil	03-09-99	0–0.5	ND (0.0238)	--	ND (0.173)	--
601583	S58FB2-GR-004-0-SS	Soil	03-09-99	0–0.5	ND (0.0250)	--	0.901	0.459
601583	S58FB2-GR-005-0-SS	Soil	03-09-99	0–0.5	ND (0.0307)	--	0.806	0.435
601583	S58FB2-GR-006-0-SS	Soil	03-09-99	0–0.5	ND (0.0287)	--	0.834	0.428
601583	S58FB2-GR-004-0-SD	Soil	03-09-99	0–0.5	ND (0.0308)	--	0.763	0.404
Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
601583	S58FB2-GR-001-0-SS	Soil	03-09-99	0–0.5	**0.905**	0.398	**59.5**	30.2
601583	S58FB2-GR-002-0-SS	Soil	03-09-99	0–0.5	**1.25**	0.417	**84.6**	12.1
601583	S58FB2-GR-003-0-SS	Soil	03-09-99	0–0.5	**1.49**	1.12	**93.0**	12.7
601583	S58FB2-GR-004-0-SS	Soil	03-09-99	0–0.5	**ND (0.193)**	--	0.786	0.532
601583	S58FB2-GR-005-0-SS	Soil	03-09-99	0–0.5	**ND (0.220)**	--	ND (0.789)	--
601583	S58FB2-GR-006-0-SS	Soil	03-09-99	0–0.5	**ND (0.207)**	--	ND (0.717)	--
601583	S58FB2-GR-004-0-SD	Soil	03-09-99	0–0.5	0.134	0.163	ND (0.498)	--
Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	--

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the MDA.
[d]Dinwiddie September 1997.
ER = Environmental restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.

Table 4.4.2.3.4-16 (Concluded)
Summary of SWMU 58, Feature 58TT (Firebrick Area No. 2) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March 1999
(On-Site Laboratory)

pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58FB2 = SWMU 58 Firebrick Area No. 2.
SD = Soil sample duplicate.
SS = Soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.3.4-17
Summary of SWMU 58, Feature 58UU (Firebrick Area No. 3) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
January 1999 and March 2000
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
603141	S58FB3-GR-005-0-SS	Soil	03-09-00	0–0.5	0.648	0.106	0.705	0.369
603141	S58FB3-GR-006-0-SS	Soil	03-09-00	0–0.5	0.196	0.0465	0.559	0.308
603141	S58FB3-GR-007-0-SS	Soil	03-09-00	0–0.5	0.659	0.111	0.818	0.449
603141	S58FB3-GR-008-0-SS	Soil	03-09-00	0–0.5	0.135	0.0468	0.774	0.416
603141	S58FB3-GR-009-0-SS	Soil	03-09-00	0–0.5	0.0927	0.0422	ND (0.117)	--
603141	S58FB3-GR-010-0-SS	Soil	03-09-00	0–0.5	0.446	0.0825	0.812	0.598
603141	S58FB3-GR-011-0-SS	Soil	03-09-00	0–0.5	0.376	0.0738	0.618	0.888
603141	S58FB3-GR-012-0-SS	Soil	03-09-00	0–0.5	0.545	0.212	0.805	0.442
603141	S58FB3-GR-013-0-SD[d]	Soil	03-09-00	0–0.5	0.121	0.0394	0.699	0.384
601577	S58FB3-GR-001-0-SS	Soil	01-28-99	0–0.5	0.133	0.0546	0.836	0.730
601577	S58FB3-GR-002-0-SS	Soil	01-28-99	0–0.5	0.542	0.158	0.850	0.450
601577	S58FB3-GR-003-0-SS	Soil	01-28-99	0–0.5	0.0647	0.0319	0.719	0.401
601577	S58FB3-GR-004-0-SS	Soil	01-28-99	0–0.5	0.242	0.0614	0.698	0.354
Background Activities—Lower Canyons Area[e]		Soil	NA	NA	1.55	NA	1.03	NA

Refer to footnotes at end of table.

Table 4.4.2.3.4-17 (Concluded)
Summary of SWMU 58, Feature 58UU (Firebrick Area No. 3) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
January 1999 and March 2000
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
603141	S58FB3-GR-005-0-SS	Soil	03-09-00	0–0.5	**ND (0.226)**	--	ND (0.795)	--
603141	S58FB3-GR-006-0-SS	Soil	03-09-00	0–0.5	0.0737	0.135	ND (0.581)	--
603141	S58FB3-GR-007-0-SS	Soil	03-09-00	0–0.5	**ND (0.240)**	--	ND (0.827)	--
603141	S58FB3-GR-008-0-SS	Soil	03-09-00	0–0.5	**ND (0.222)**	--	ND (0.738)	--
603141	S58FB3-GR-009-0-SS	Soil	03-09-00	0–0.5	**ND (0.197)**	--	ND (0.682)	--
603141	S58FB3-GR-010-0-SS	Soil	03-09-00	0–0.5	**ND (0.231)**	--	ND (0.805)	--
603141	S58FB3-GR-011-0-SS	Soil	03-09-00	0–0.5	**0.169**	0.156	ND (0.659)	--
603141	S58FB3-GR-012-0-SS	Soil	03-09-00	0–0.5	**ND (0.241)**	--	ND (0.848)	--
603141	S58FB3-GR-013-0-SD[e]	Soil	03-09-00	0–0.5	**ND (0.184)**	--	ND (0.652)	--
601577	S58FB3-GR-001-0-SS	Soil	01-28-99	0–0.5	0.0958	0.167	ND (0.518)	--
601577	S58FB3-GR-002-0-SS	Soil	01-28-99	0–0.5	**ND (0.215)**	--	0.588	0.409
601577	S58FB3-GR-003-0-SS	Soil	01-28-99	0–0.5	0.127	0.157	ND (0.496)	--
601577	S58FB3-GR-004-0-SS	Soil	01-28-99	0–0.5	0.131	0.160	ND (0.441)	--
Background Activities—Lower Canyons Area[e]		Soil	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the MDA.
[d]S58FB3-GR-013-0-SD is a duplicate of S58FB3-GR-009-0-SS.
[e]Dinwiddie September 1997.

ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58FB3 = SWMU 58 Firebrick Area No. 3.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.3.4-18
Summary of SWMU 58, Feature 58VV (Firebrick Area No. 1) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
January 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
601309	S58FB1-GR-001-0-SS	Soil	01-25-99	0–0.5	0.273	0.0693	0.644	0.387
601309	S58FB1-GR-002-0-SS	Soil	01-25-99	0–0.5	0.546	0.0941	0.825	0.436
Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID[c]	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
601309	S58FB1-GR-001-0-SS	Soil	01-25-99	0–0.5	**ND (0.195)**	--	ND (0.521)	--
601309	S58FB1-GR-002-0-SS	Soil	01-25-99	0–0.5	**ND (0.199)**	--	ND (0.501)	--
Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the MDA.
[d]Dinwiddie September 1997.
ER = Environmental restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58FB1 = SWMU 58, Firebrick Area No. 1 (Feature 58VV).
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

For the samples collected in 1996 (SWMU 58O only) and analyzed at the SNL/NM on-site laboratory, detections for arsenic, cadmium, copper, mercury, selenium, and silver were above the approved background limits. However, these higher detection levels do not impact site characterization. In 1997, six sample locations at SWMU 58O were resampled.

The following results for the 1996 and 1997 samples were reported:

- Except for the 1996 samples analyzed on site (which were all nondetections within an MDL above the background limit), all samples from SWMUs 58O, 58TT, 58UU, 58VV were below the background limit for arsenic.

- Three samples collected at SWMU 58O contained elevated barium concentrations ranging from 437J to 988J mg/kg, compared to a background limit of 246 mg/kg. All other samples were below the background limit for barium.

- Six samples from SWMU 58O contained elevated cadmium ranging from 1.15 to 2.78 mg/kg compared to the background limit of 0.64 mg/kg. Except for the 1996 samples analyzed on site (which were all nondetections at an MDL above the background limit), all other samples were below the background limit for cadmium.

- One sample collected at SWMU 58O contained elevated chromium at a level of 25.4 mg/kg, compared to a background limit of 18.8 mg/kg. All other samples were below the background limit for chromium.

- Eight samples collected from SWMU 58O contained elevated copper at concentrations ranging from 19.2 to 30J, above the background limit of 17.1 mg/kg, and six had MDLs above the background limit. All other samples were below the background limit for copper.

- Four samples from SWMU 58O, three samples from SWMU 58TT, and one sample from SWMU 58UU contained elevated lead at levels ranging from to 24.7J to 78.8J mg/kg, compared to a background limit of 18.9 mg/kg. All other samples were below the background limit for lead.

- One sample collected at SWMU 58O and one sample from SWMU 58UU contained elevated mercury concentrations ranging from 0.0844 to 0.094J mg/kg, compared to the background limit of 0.055 mg/kg. Except for the 1996 samples analyzed on site that had MDLs above the background limit, all other samples were below the background limit for mercury.

- One sample collected at SWMU 58O contained an elevated nickel concentration of 17.7 mg/kg, compared to a background limit of 16.6 mg/kg. All other samples were below the background limit for nickel.

- Except for the 1996 samples analyzed on site that had MDLs above the background limit, all samples from SWMUs 58O, 58TT, 58UU, and 58VV were below the background limit for selenium.

- Except for the 1996 samples analyzed on site that had MDLs above the background limit, all samples from SWMUs 58O, 58TT, 58UU, and 58VV were below the background limit for silver.

- Two samples collected at SWMU 58O and one sample from SWMU 58UU contained elevated zinc concentrations ranging from 56.2 to 71.8 mg/kg.

Organic Compounds

Surface and subsurface soil samples were collected from SWMUs 58I and 58O and analyzed for VOCs, SVOCs, and TPH. Soil samples collected from SWMUs 58TT, 58UU, and 58VV were not analyzed for organic compounds.

Table 4.4.2.3.4-6 summarizes the VOC analytical results for the surface soil samples collected at SWMU 58O. Except for acetone and toluene, which were detected in four surface soil samples from SWMU 58O, no other VOCs were detected in samples from SWMUs 58I and 58O. The slightly elevated concentrations of VOCs detected in the soil and blank samples could indicate laboratory contamination. Tables 4.4.2.3.4-7 and 4.4.2.3.4-8 provide the VOC MDLs for surface and subsurface soil samples.

Tables 4.4.2.3.4-9 and 4.4.2.3.4-10 summarize the SVOC analytical results for the surface and subsurface soil samples collected at SWMUs 58I and 58O, respectively.

The following SVOCs were detected in the samples:

- N-Nitrosodiphenylamine was detected in two samples from SWMU 58I at concentrations up to 253J μg/kg.
- 2,4-Dinitrotoluene was detected in three samples from SWMU 58I at levels up to 326J μg/kg.
- Benzo(b)anthracene, benzo(a)pyrene, chrysene, fluoranthene, and pyrene were detected at low concentrations (up to 334 μg/kg) in one sample from SWMU 58O.
- One sample from SWMU 58O contained bis(2-ethylhexyl)phthalate at 342 μg/kg.

No other SVOCs were detected. Tables 4.4.2.3.4-11 and 4.4.2.3.4-12 contain the SVOC MDLs for surface and subsurface samples, respectively.

No TPH were detected in any of the soil samples collected at SWMUs 58I and 58O; the MDLs ranged from 0.0324 to 0.0333 mg/kg.

HE Compounds

Soil samples collected from SWMUs 58O and 58TT were analyzed for HE compounds. The sample locations are exactly the same locations where samples were collected for metal and radionuclide analysis. Table 4.4.2.3.4-13 summarizes the HE compound analytical results for the surface and subsurface soil samples collected at SWMU 58O. One sample from SWMU 58O contained RDX at a concentration of 19,900J μg/kg. No HE compounds were detected in any of the samples collected from SWMU 58TT.

Tables 4.4.2.3.14 and 4.4.2.3.4-15 provide the HE compound MDLs for SWMUs 58O and 58TT, respectively.

Radionuclides

A total of 22 soil samples collected from SWMUs 58TT, 58UU, and 58VV were analyzed for radionuclides by gamma spectroscopy. The sample locations are exactly the same locations where samples were collected for metals analysis. Because radionuclides were not COCs at SWMUs 58I and 58O, no radionuclide analysis was performed for these features.

Tables 4.4.2.3.4-16 through 4.4.2.3.4-18 summarize the on-site gamma spectroscopy analysis results for the RFI soil samples collected at SWMUs 58TT, 58UU, and 58VV. The following detections were reported:

- Three samples from SWMU 58TT contained elevated uranium-238 activity above the background limit of 2.31 pCi/g, ranging from 59.5 to 93.0 pCi/g.
- All samples from SWMUs 58TT, 58UU, and 58VV contained thorium-232 activity below the background limit of 1.03 pCi/g.
- Three samples from SWMU 58TT and one sample from SWMU 58UU contained elevated uranium-235 activity above the background limit of 0.16 pCi/g, ranging from 0.169 to 1.49 pCi/g. Thirteen samples from all three sites contained MDAs above the background limit, ranging from 0.184 to 0.241 pCi/g.
- All samples from SWMUs 58TT, 58UU, and 58VV contained cesium-137 activity below the background limit of 1.55 pCi/g.

Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

4.4.2.3.4.1 Data Quality Results for SWMUs 58I, 58O, 58TT, 58UU, 58VV (SWMU 58 Test Locations Involving Burn Tests)

This section discusses the results of analyses of the QA/QC samples that were collected during the RFI at SWMUs 58I, 58O, 58TT, 58UU, and 58VV from 1996 to 2000. The QA/QC samples included seven duplicate, four EB, four FB, one soil blank (SB), and one TB sample. The EB/FB/SB samples were analyzed for metals, VOCs, SVOCs, HE compounds, and TPH. The TB sample was analyzed for VOCs.

For features where metals analysis was performed (SWMUs 58O, 58TT, 58UU and 58VV), metal concentrations in EB samples were slightly greater than the MDLs for barium, beryllium, chromium, copper, mercury, nickel, and zinc. The concentrations of beryllium, chromium, copper, mercury, nickel, and zinc were below the PQL, and the results were qualified as J (estimated). No SVOCs or HE compounds were detected in the EB samples. Acetone and methylene chloride, which are common laboratory contaminants, were detected in several EB samples. No VOCs were detected in the TB sample. TPH was detected in one EB sample.

For features where metals analysis was performed (SWMUs 58O, 58TT, 58UU, and 58VV), metal concentrations in the FB samples were slightly above the MDLs for barium, copper, and

mercury. The concentrations of barium, copper, and mercury were below the PQL, and the results were qualified as J (estimated). Acetone and methylene chloride, which are common laboratory contaminants, were detected in several FB samples. TPH was detected in one FB sample at a very low concentration.
RPDs were calculated for the metals and radionuclides detected in the primary and duplicate samples for SWMUs 58O, 58TT, and 58UU, which were analyzed off site by GEL and on site by the SNL/NM laboratory. The RPDs are presented in Tables 4.4.2.3.4-19 through 4.4.2.3.4-21. One of the two sample pairs for SWMU 58O exceeded the RPD limit for chromium, and the second sample pair for SWMU 58O exceeded the RPD limit for lead, mercury, and selenium. Although the RPDs presented in Tables 4.4.2.3.4-19 through 4.4.2.3.4-21 exceed the RPD limit for chromium, lead, mercury, and selenium, the values are typical of the heterogeneous soil and are therefore acceptable.

Data Validation Results for SWMUs 58I, 58O, 58TT, 58UU, 58VV (SWMU 58 Test Locations Involving Burn Tests)

All off-site laboratory results were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For AR/COC 05074, validation qualifications were applied to the organic data for soil and aqueous sample results. Methylene chloride was detected in the soil method blank, the soil TB, and the aqueous TB, and the results were qualified as not detected in the associated samples. The soil sample internal standard was outside QC limits, and the associated results were qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 05081, validation qualifications were applied to the organic data for soil and aqueous sample results. All samples were outside the temperature criteria upon receipt. Positive sample results were qualified as estimated, and nondetected results were qualified as nondetect, estimated. Methylene chloride was detected in the method blank for the EB, TB, and FB samples, and the sample results were qualified as not detected. Methylene chloride was detected in the soil method blank, and results less than ten times the blank concentration were qualified as not detected. Acetone was detected in the EB, TB, and FB samples, and results less than ten times the blank concentration were qualified as not detected. No other sample results were qualified.

For AR/COC 05115, validation qualifications were applied to the metal and VOC data for soil and aqueous sample results. Beryllium and chromium were detected in the aqueous method blank, and soil sample results were qualified as estimated. The MS/MSD percent recoveries were outside QC limits for barium, and soil sample results were qualified as estimated in the associated samples. Methylene chloride was detected in the method blank for all samples, and all soil samples were qualified as not detected. No other sample results were qualified.

Table 4.4.2.3.4-19
Summary of SWMU 58, Feature 58O Field Duplicate Relative Percent Difference Values
April 1996 and December 1997
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
510119	58O-GR-001-0-SS 58O-GR-001-0-SSD	0–0.5	8.73	19.67	15.65	11.01	41.46	12.09	8.15	NC	10.70	NC	16.43	11.41
05115	58O-GR-0-0-1.0-SS 58O-GR-0-0-1.0-SSD	0–0.5	10.62	6.21	5.36	1.21	10.46	6.27	59.80	66.67	6.44	26.79	NC	NC

[a]Analysis request/chain-of-custody record.
58O = SWMU 58, Feature O.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NC = Not calculated for nondetected results or laboratory estimated values.
SS = Surface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-20
Summary of SWMU 58, Feature 58TT (Firebrick Area No.2) Field Duplicate Relative Percent Difference Values
March 1999
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
601584	S58FB2-GR-004-0-SS S58FB2-GR-004-0-SD	0–0.5	12.72	2.23	5.66	11.59	3.46	NA	3.10	NC	11.79	NC	1.85	NA

[a]Analysis request/chain-of-custody record.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not analyzed.
NC = Not calculated for nondetected results or laboratory estimated values.
S58FB2 = SWMU 58, Firebrick Area No. 2 (Feature 58TT).
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.3.4-21
Summary of SWMU 58, Feature 58UU (Firebrick Area No.3) Field Duplicate Relative Percent Difference Values
March 2000
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
603140	S58FB3-GR-009-0-SS S58FB3-GR-013-0-SD	0–0.5	2.14	1.02	2.37	NC	NA	NC	7.40	NC	10.42	NC	NC	NC

[a]Analysis request/chain-of-custody record.
[b]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not analyzed.
NC = Not calculated for nondetected results or laboratory estimated values.
S58FB3 = SWMU 58, Firebrick Area No. 3 (Feature UU).
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

For AR/COC 05127, validation qualifications were applied to the metal and VOC data for soil and aqueous sample results. Barium and mercury were detected in the aqueous method blank, and the soil samples were qualified as estimated in the associated samples. Arsenic was detected in the soil method blank, and the results were qualified as estimated in the associated samples. Methylene chloride was detected in the aqueous method blank, and results less than ten times the blank concentration were qualified as not detected. Methylene chloride was detected in the soil method blank, and results less than ten times the blank concentration were qualified as not detected. Acetone was detected in the EB sample, and results less than ten times the blank concentration were qualified not detected. Internal standards did not meet QC standards for three soil samples, and the results were qualified as estimated or nondetect, estimated. No other sample results were qualified.

For AR/COC 601308, validation qualifications were applied to the metals and organics data for soil and aqueous sample results. Mercury was detected in the soil method blank, and the positive soil sample results were qualified as estimated. The initial calibration blank (ICB) was outside QC limits for 4-methyl-2-pentanone, and the associated result was qualified as nondetect, estimated. The continuing calibration verification (CCV) was outside QC limits for acetone, and the associated results were qualified as nondetect, estimated. Methylene chloride was detected in the method blank, and the associated soil sample results were qualified as not detected. Bis(2-chloroisopropyl)ether and 3,3'-dichlorobenzidine were outside QC limits for the CCV, and the results were qualified as unusable. TPH was detected in the method blank, and the associated soil sample results were qualified as not detected. The MS/MSD percent recoveries were outside QC limits for TPH, and the positive results were qualified as estimated. No other sample results were qualified.

For AR/COC 601584, validation qualifications were applied to the metal and organic data for soil sample results. Silver was detected in the continuing calibration blank (CCB) and method blank, and the soil sample results were qualified as estimated. Lead was detected in the ICB, and positive results were qualified as estimated, and nondetections were qualified as nondetect, estimated. The MD/MSD percent recoveries were outside QC limits for pyridine and m,p-cresol, and the soil sample results were qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 603140, validation qualifications were applied to the metal data for soil sample results. Arsenic was detected in the CCB, and sample results were qualified as estimated in the associated sample. Zinc was detected in the method blank, and sample results were qualified as estimated in the associated samples. Selenium was outside the QC limits in the initial calibration verification and CCB, and the results were qualified as nondetect, estimated in the associated samples. No other sample results were qualified.

4.4.2.4 SWMU 58G (HALO Bunker)

Tests at SWMU 58G (HALO Bunker) involved detonating explosives surrounding a cylinder of argon gas. The materials used included HE, argon, a metal tank, and test components. In 1993, RUST Geotech Inc. conducted a surface radiation survey in the area of the HALO Bunker, and radioactive metal fragments were found southeast of the bunker (Figure 4.3.6-1) (SNL/NM September 1997). In 1995, SNL/NM performed a VCM to remove the radioactive fragments and point sources. RFI sampling was conducted in April and May 1996. The HALO Bunker is no longer in use and was decommissioned in 2003.

4.4.2.4.1 Sampling Activities at SWMU 58G (HALO Bunker)

Sampling activities were conducted at SWMU 58G (HALO Bunker) as described in the OU 1332 RFI Work Plan (SNL/NM June 1995). Samples were analyzed for metals at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory. Swipe samples and surface sediment/soil samples were collected as follows:

- Swipe Samples of Bunker Walls and Floor. Two random wipe samples were collected from each of the three metal-clad bunker walls and three from the floor of the bunker (Figure 4.4.2.4.1-1).

- Sediment Samples of Concrete Pit. One sediment sample was collected from the bottom of the concrete pit located just north of the firing point in the bunker (Figure 4.4.2.4.1-1).

- Soils Samples around Bunker. Six soil samples were collected at random locations north of the open side of the bunker (Figure 4.4.2.4.1-1). No locations were found during sampling that showed visible evidence of COCs; therefore, no judgmental samples were added to the sampling program.

4.4.2.4.2 Sampling Results for SWMU 58G (HALO Bunker)

Because the HALO Bunker has been removed, no discussion of the results from swipe sampling is provided.

To summarize the sediment/soil results, several metals were detected above the background levels, and one radionuclide was detected above its background level. The analytical results are incorporated into the Risk Assessment for SWMUs 8 and 58 (Annex A).

Tables 4.4.2.4.2-1 and 4.4.2.4.2-2 summarize the metals analytical results for the swipe and sediment/soil samples collected from the HALO Bunker, respectively. The following detections were reported:

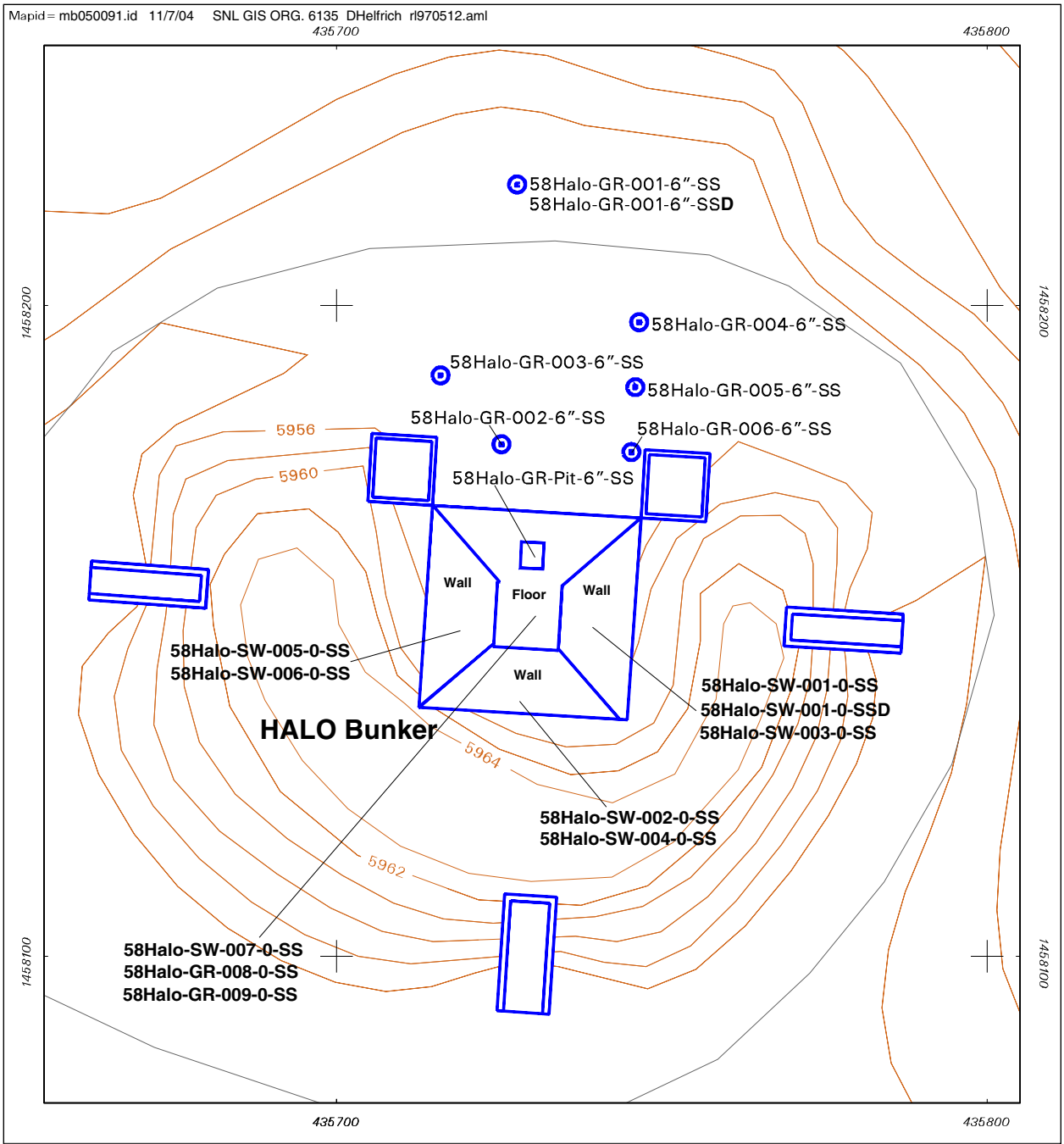
- Sediment/soil sample concentrations were less than background levels for arsenic, beryllium, nickel, and selenium.

- Five samples contained elevated barium concentrations ranging from 272 to 447 mg/kg, compared to a background level of 246 mg/kg.

- One sample contained an elevated cadmium concentration of 2.25 mg/kg, which is above the background level of 0.64 mg/kg.

- One sample contained an elevated chromium concentration of 36.3J mg/kg, compared to the background level of 18.8 mg/kg.

- Seven samples contained elevated copper concentrations ranging from 18.3 to 684 mg/kg, compared to a background limit of 17.1 mg/kg.



Legend

- Randomly selected sample location
- Unpaved Road
- 2-Foot Elevation Contour
- Physical Features

Figure 4.4.2.4.1-1
Surface soil and swipe sample locations
at Feature 58G
(HALO Bunker)

0 12.5 25
Scale in Feet

0 3 6
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A6

Table 4.4.2.4.2-1
Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Swipe Sampling, Metals Analytical Results
May 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/swipe)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Copper	Chromium
04316	58 HALO-SW-001-0-SS	Swipe	05-08-96	NA	0.917	11.2	0.0314 J (0.25)	0.0893 J (0.25)	62.8	3.44
04316	58 HALO-SW-001-0-SSD	Swipe	05-08-96	NA	1.12	15.4	0.0364 J (0.25)	0.194 J (0.25)	103	4.89
04316	58 HALO-SW-002-0-SS	Swipe	05-08-96	NA	1.03	7.18	0.0169 J (0.25)	0.0313 J (0.25)	4.25	11.0
04316	58 HALO-SW-003-0-SS	Swipe	05-08-96	NA	0.802	7.99	0.0175 J (0.25)	0.0408 J (0.25)	5.28	20.8
04316	58 HALO-SW-004-0-SS	Swipe	05-08-96	NA	1.08	5.67	0.0128 J (0.25)	0.0420 J (0.25)	3.89	18.9
04316	58 HALO-SW-005-0-SS	Swipe	05-08-96	NA	0.986	6.15	0.0141 J (0.25)	0.0256 J (0.25)	3.14	90.1
04316	58 HALO-SW-006-0-SS	Swipe	05-08-96	NA	1.04	7.19	0.0171 J (0.25)	0.0334 J (0.25)	3.74	1.65
04316	58 HALO-SW-007-0-SS	Swipe	05-08-96	NA	2.27	34.9	0.122 J (0.25)	0.661	35.3	95.7
04316	58 HALO-GR-008-0-SS	Swipe	05-08-96	NA	2.98	40.4	0.125 J (0.25)	1.51	21.9	642
04316	58 HALO-GR-009-0-SS	Swipe	05-08-96	NA	1.32	14.6	0.0462 J (0.25)	0.285	6.51	68.7
Quality Assurance/Quality Control Samples										
04316	58 HALO-SW-010-0-SS[c]	Swipe	05-08-96	NA	0.263 J (0.5)	0.212 J (0.5)	ND (0.000570)	ND (0.25)	0.188 J (0.5)	0.131 J (0.5)

Refer to footnotes at end of table.

Table 4.4.2.4.2-1 (Continued)
Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Swipe Sampling, Metals Analytical Results
May 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/swipe)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Mercury	Nickel	Lead	Selenium	Silver	Zinc
04316	58 HALO-SW-001-0-SS	Swipe	05-08-96	NA	0.164	1.11	63.7	0.390	ND (0.125)	31.5
04316	58 HALO-SW-001-0-SSD	Swipe	05-08-96	NA	0.109	1.61	72.3	0.419	ND (0.125)	50.2
04316	58 HALO-SW-002-0-SS	Swipe	05-08-96	NA	0.160	2.74	27.4	0.312	ND (0.125)	27.3
04316	58 HALO-SW-003-0-SS	Swipe	05-08-96	NA	0.157	0.798	63.6	0.276	ND (0.125)	38.0
04316	58 HALO-SW-004-0-SS	Swipe	05-08-96	NA	0.151	0.827	22.3	0.543	ND (0.125)	40.3
04316	58 HALO-SW-005-0-SS	Swipe	05-08-96	NA	0.111	0.789	50.7	0.345	ND (0.125)	164
04316	58 HALO-SW-006-0-SS	Swipe	05-08-96	NA	0.0815	0.733	6.7	0.477	ND (0.125)	11.6
04316	58 HALO-SW-007-0-SS	Swipe	05-08-96	NA	0.175	3.09	183	0.388	ND (0.125)	196
04316	58 HALO-SW-008-0-SS	Swipe	05-08-96	NA	0.124	3.19	332	0.477	0.220 J (0.5)	1,210
04316	58 HALO-SW-009-0-SS	Swipe	05-08-96	NA	0.122	1.19	114	0.384	ND (0.125)	163
Quality Assurance/Quality Control Samples										
04316	58 HALO-SW-010-0-SS[c]	Swipe	05-08-96	NA	0.0844 J	0.108 J (0.5)	0.216 J (0.25)	ND (0.07)	ND (0.125)	7.54

Refer to footnotes at end of table.

Table 4.4.2.4.2-1 (Concluded)
Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Swipe Sampling, Metals Analytical Results
May 1996
(Off-Site Laboratory)

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample 58HALO-GR-010-0-SS is a field blank.
58HALO = SWMU 58, HALO Bunker (Feature G).
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg = Milligram(s).
NA = Not applicable.
ND ( ) = Not detected at or above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface sample.
SSD = Surface sample duplicate.
SW = Swipe sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.4.2-2
Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Sediment/Soil Sampling, Metals Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
05077	58HALO-GR-001-0.5-SS	Soil	04-24-96	0–0.5	2.42	152	0.359 J (0.5)	0.263 J (0.5)	16.5	**18.3**
05077	58HALO-GR-001-0.5-SSD	Soil	04-24-96	0–0.5	2.85	137	0.382 J (0.485)	0.272 J (0.485)	9.01	12.7
05077	58HALO-GR-002-0.5-SS	Soil	04-24-96	0–0.5	3.02	**378**	0.431 J (0.463)	0.467	7.42	**25.9**
05077	58HALO-GR-003-0.5-SS	Soil	04-24-96	0–0.5	3.17	243	0.464 J (0.485)	0.440 J (0.485)	11.5	**23.0**
05077	58HALO-GR-004-0.5-SS	Soil	04-24-96	0–0.5	3.03	**416**	0.404 J (0.49)	0.360 J (0.49)	8.56	**31.8**
05077	58HALO-GR-005-0.5-SS	Soil	04-24-96	0–0.5	3.39	**447**	0.430 J (0.463)	0.373 J (0.463)	12.8	**44.4**
05077	58HALO-GR-006-0.5-SS	Soil	04-24-96	0–0.5	2.64	**272**	0.418 J (0.467)	0.516	**36.3**	**26.8**
05077	58HALO-GR-PIT-0.5-SS	Soil	04-24-96	0–0.5	3.85	**333**	0.537	**2.25**	10	**684**
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
05077	58HALO-GR-006-EB	Water	04-24-96	NA	ND (0.00186)	0.00182 J (0.01)	ND (0.0000114)	ND (0.0000970)	0.00133 J (0.01)	0.00339 J (0.01)
05077	58HALO-GR-006-FB	Water	04-24-96	NA	ND (0.00186)	0.00203 J (0.01)	ND (0.0000114)	ND (0.0000970)	ND (0.000596)	0.000551 J (0.01)

Refer to footnotes at end of table.

Table 4.4.2.4.2-2 (Continued)
Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Sediment/Soil Sampling, Metals Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
05077	58HALO-GR-001-0.5-SS	Soil	04-24-96	0–0.5	10.9	0.0153 J (0.0312)	10.3	0.320 J (0.5)	ND (0.249)	24.9
05077	58HALO-GR-001-0.5-SSD	Soil	04-24-96	0–0.5	13.4	0.0168 J (0.0294)	8.15	0.356 J (0.485)	ND (0.242)	25.6
05077	58HALO-GR-002-0.5-SS	Soil	04-24-96	0–0.5	18.9	0.0206 J (0.0332)	7.76	0.500	ND (0.231)	47.1
05077	58HALO-GR-003-0.5-SS	Soil	04-24-96	0–0.5	15.4	0.0113 J (0.0252)	8.43	0.442 J (0.485)	ND (0.242)	41.9
05077	58HALO-GR-004-0.5-SS	Soil	04-24-96	0–0.5	18.5	0.0166 J (0.0314)	8.32	0.302 J (0.49)	ND (0.244)	**205**
05077	58HALO-GR-005-0.5-SS	Soil	04-24-96	0–0.5	**29.0**	0.0276 J (0.0312)	9.88	0.471	ND (0.231)	**52.3**
05077	58HALO-GR-006-0.5-SS	Soil	04-24-96	0–0.5	**19.8**	**0.0699**	14.5	0.470	ND (0.233)	**108**
05077	58HALO-GR-PIT-0.5-SS	Soil	04-24-96	0–0.5	**115**	**0.132**	9.94	0.702	**1.75**	**129**
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)										
05077	58HALO-GR-006-EB	Water	04-24-96	NA	ND (0.00113)	0.0000440 J (0.0002)	0.00134 J (0.01)	ND (0.00143)	ND (0.00249)	0.00867 J (0.02)
05077	58HALO-GR-006-FB	Water	04-24-96	NA	ND (0.00113)	0.000999	ND (0.000807)	ND (0.00143)	ND (0.00249)	ND (0.00270)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
58HALO = SWMU 58, HALO Bunker (Feature G).
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.

Table 4.4.2.4.2-2 (Concluded)
Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Sediment/Soil Sampling, Metals Analytical Results
April 1996
(Off-Site Laboratory)

ID	= Identification.
J	= Estimated concentration.
J ()	= The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL	= Method detection limit.
mg/kg	= Milligram(s) per kilogram.
mg/L	= Milligram(s) per liter.
NA	= Not applicable.
ND ( )	= Not detected above the MDL, shown in parentheses.
NMED	= New Mexico Environment Department.
PIT	= Concrete Pit.
RCRA	= Resource Conservation and Recovery Act.
RFI	= RCRA Facility Investigation.
SS	= Surface soil sample.
SSD	= Soil sample duplicate.
SWMU	= Solid Waste Management Unit.

- Three samples contained elevated lead concentrations above the background limit of 18.9 mg/kg, with concentrations ranging from 19.8 to 115 mg/kg.

- Two samples contained elevated mercury concentrations of 0.0699 and 0.132 mg/kg, compared to the background limit of 0.055 mg/kg.

- One sample contained an elevated silver concentration at a concentration of 1.75 mg/kg, compared to a background limit of less than 0.5 mg/kg.

- Four samples contained elevated zinc concentrations ranging from 52.3 to 205 mg/kg, compared to a background limit of 52.1 mg/kg.

Table 4.4.2.4.2-3 summarizes the results of gamma spectroscopy analysis for radionuclides for samples collected from the HALO Bunker. The following detections were reported:

- With the exception of one sample with an elevated thorium-232 activity of 1.04 pCi/g, all sample results were below approved background activities.

- Six samples contained uranium-235 at MDL activities above the approved background activity, and seven contained uranium-238 at MDL activities above the background activity.

Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

4.4.2.4.3 Data Quality Results for SWMU 58G (HALO Bunker)

QA/QC field samples collected as part of the RFI soil sampling event included one soil duplicate, one swipe duplicate, one aqueous EB, and one aqueous FB sample. The EB/FB samples were analyzed at an off-site laboratory for metals.

Metal concentrations in the EB sample were greater than the MDLs for barium, chromium, copper, mercury, nickel, and zinc, but were below the respective PQLs, and the results were qualified as J (estimated).

Metals concentrations in the FB sample were greater than the MDLs for barium, copper, and mercury. The concentrations of barium, copper, and mercury were below the PQL, and the results were qualified as J (estimated).

RPDs were calculated for the metals detected in the primary and duplicate samples analyzed by GEL for metals. The RPDs are presented in Table 4.4.2.4.3-1. The soil sample pair exceeded the acceptable RPD limit for chromium. The swipe sample pair exceeded the RPD limit of 25 percent for barium, chromium, mercury, nickel, lead, and zinc. Although the RPDs presented in Table 4.4.2.4.3-1 exceed the RPD limit, the values are typical of the heterogeneous uncontaminated soil/sediment and are therefore acceptable.

Data Validation Results for SWMU 58G (HALO Bunker)

The off-site laboratory results from GEL were reviewed and verified/validated according to “Data Verification/Validation, Level 3–DV-3,” as defined in “Data Validation Procedure for Chemical and Radiochemical Data,” SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999).

Table 4.4.2.4.2-3
Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
April 1996
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
05079	58HALO-GR-001-0.5-SS	Soil	04-24-96	0–0.5	0.145	0.0299	0.720	0.3.44
05079	58HALO-GR-002-0.5-SS	Soil	04-24-96	0–0.5	0.0881	0.0207	0.991	0.466
05080	58HALO-GR-003-0.5-SS	Soil	04-24-96	0–0.5	0.118	0.0272	0.936	0.432
05080	58HALO-GR-004-0.5-SS	Soil	04-24-96	0–0.5	0.0515	0.0198	0.874	0.414
05080	58HALO-GR-005-0.5-SS	Soil	04-24-96	0–0.5	0.0563	0.0181	0.792	0.377
05080	58HALO-GR-006-0.5-SS	Soil	04-24-96	0–0.5	0.173	0.0311	0.688	0.323
05080	58HALO-GR-PIT-0.5-SS	Soil	04-24-96	0–0.5	0.138	0.0291	**1.04**	0.488
Background Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA
Quality Assurance /Quality Control Samples (pCi/mL)								
05080	58HALO-GR-006-EB	Water	04-24-96	NA	0.00484	0.0412	ND (0.128)	NA
05080	58HALO-GR-006-FB	Water	04-24-96	NA	ND (0.0207)	NA	ND (0.124)	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID[c]	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error
05079	58HALO-GR-001-0.5-SS	Soil	04-24-96	0–0.5	**ND (0.207)**	--	**ND (2.87)**	--
05079	58HALO-GR-002-0.5-SS	Soil	04-24-96	0–0.5	0.0863	0.117	**ND (3.30)**	--
05080	58HALO-GR-003-0.5-SS	Soil	04-24-96	0–0.5	**ND (0.229)**	--	**ND (3.16)**	--
05080	58HALO-GR-004-0.5-SS	Soil	04-24-96	0–0.5	**ND (0.209)**	--	**ND (2.96)**	--
05080	58HALO-GR-005-0.5-SS	Soil	04-24-96	0–0.5	**ND (0.210)**	--	**ND (2.95)**	--
05080	58HALO-GR-006-0.5-SS	Soil	04-24-96	0–0.5	**ND (0.201)**	--	**ND (2.86)**	--
05080	58HALO-GR-PIT-0.5-SS	Soil	04-24-96	0–0.5	**ND (0.224)**	--	**ND (3.22)**	--
Background Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	--
Quality Assurance /Quality Control Samples (pCi/mL)								
05080	58HALO-GR-006-EB	Water	04-24-96	NA	ND (0.140)	NA	ND (1.78)	NA
05080	58HALO-GR-006-FB	Water	04-24-96	NA	ND (0.147)	NA	ND (1.69)	NA

Refer to footnotes at end of table.

Table 4.4.2.4.2-3 (Concluded)
Summary of SWMU 58, Feature 58G (HALO Bunker) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
April 1996
(On-Site Laboratory)

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the MDA.
[d]Dinwiddie September 1997.
58HALO = SWMU 58, HALO Bunker (Feature G).
ER = Environmental Restoration.
EB = Equipment blank.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
PIT = Concrete Pit.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
SS = Surface soil sample.
-- = Error not calculated for nondetect results.

Table 4.4.2.4.3-1
Summary of SWMU 58, Feature 58G (HALO Bunker) Field Duplicate Relative Percent Difference Values
April–May 1996
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference										
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Mercury	Nickel	Lead	Selenium	Silver	Zinc
5077	58HALO-GR-001-0.5-SS 58HALO-GR-001-0.5-SSD	0–0.5	16.32	10.38	6.21	3.36	58.72	9.35	23.31	20.58	10.65	NC	2.77
4316	58HALO-SW-001-0-SS 58HALO-SW-001-0-SSD	NA	19.93	31.58	14.75	NC	117.80	144.72	160.74	109.22	NC	NC	29.96

[a]Analysis request/chain-of-custody record.
58HALO = SWMU 58, HALO Bunker (Feature G).
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not applicable.
NC = Not calculated.
SS = Soil Sample.
SSD = Soil sample duplicate.
SW = Swipe sample.
SWMU = Solid Waste Management Unit.

The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For AR/COC 04316, validation qualifications were applied to the metals swipe sample results. Arsenic, mercury, and zinc were detected in the FB sample, and sample results less than five times the FB concentrations were qualified as estimated. Arsenic, chromium, and lead were detected in the method blank, and the FB sample results were qualified as estimated.

For AR/COC 05077, validation qualifications were applied to the metals soil and aqueous sample results. Mercury was detected in the method blank, and the EB sample result was qualified as estimated. Barium was detected in the method blank, and the FB sample result was qualified as estimated.

4.4.2.5 SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

The UCS connected electrical and communication wires from a control bunker with various test areas at SWMU 58. Three sets of wires, cables, and associated piping extended along the entire length of the system. The UCS started at SWMU 58W (control bunker) and extended to a former concrete-block test structure, SWMU 58K (Figure 4.4.2.5-1). Four manholes (SWMUs 58AA, 58BB, 58EEE, and 58FFF) provided access to the conduit system (Figure 4.4.2.5-2).

In August 2000, SNL/NM performed a surface radiation survey over the UCS area, and no anomalies (elevated radioactivity) were found. RFI sampling was conducted in March and April 1996. A VCA was conducted in October and November 2000 to remove the UCS and collect confirmatory samples. The post-VCA soil confirmatory sampling results are discussed in detail in Section 4.5.3.

4.4.2.5.1 Sampling Activities at SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

Sampling activities were conducted in 1996 at SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS) as described in Section 5.3 of the OU 1332 RFI Work Plan (SNL/NM June 1995). In addition, confirmatory samples were collected following the VCA activities in October and November 2000, and the sample results are discussed in Section 4.5.4.

The 1996 surface and subsurface samples were collected as follows.

Surface Samples (manholes)—Soil samples were collected from the interiors of each of the manholes for SWMUs 58W, 58AA, 58BB, 58EEE, and 58FFF (Figure 4.4.2.5-2). Samples were analyzed for VOCs by GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

Subsurface Samples—Twenty-two boreholes were drilled along the entire length of the UCS, including 18 random locations and 4 locations immediately downslope of Manholes 58AA,

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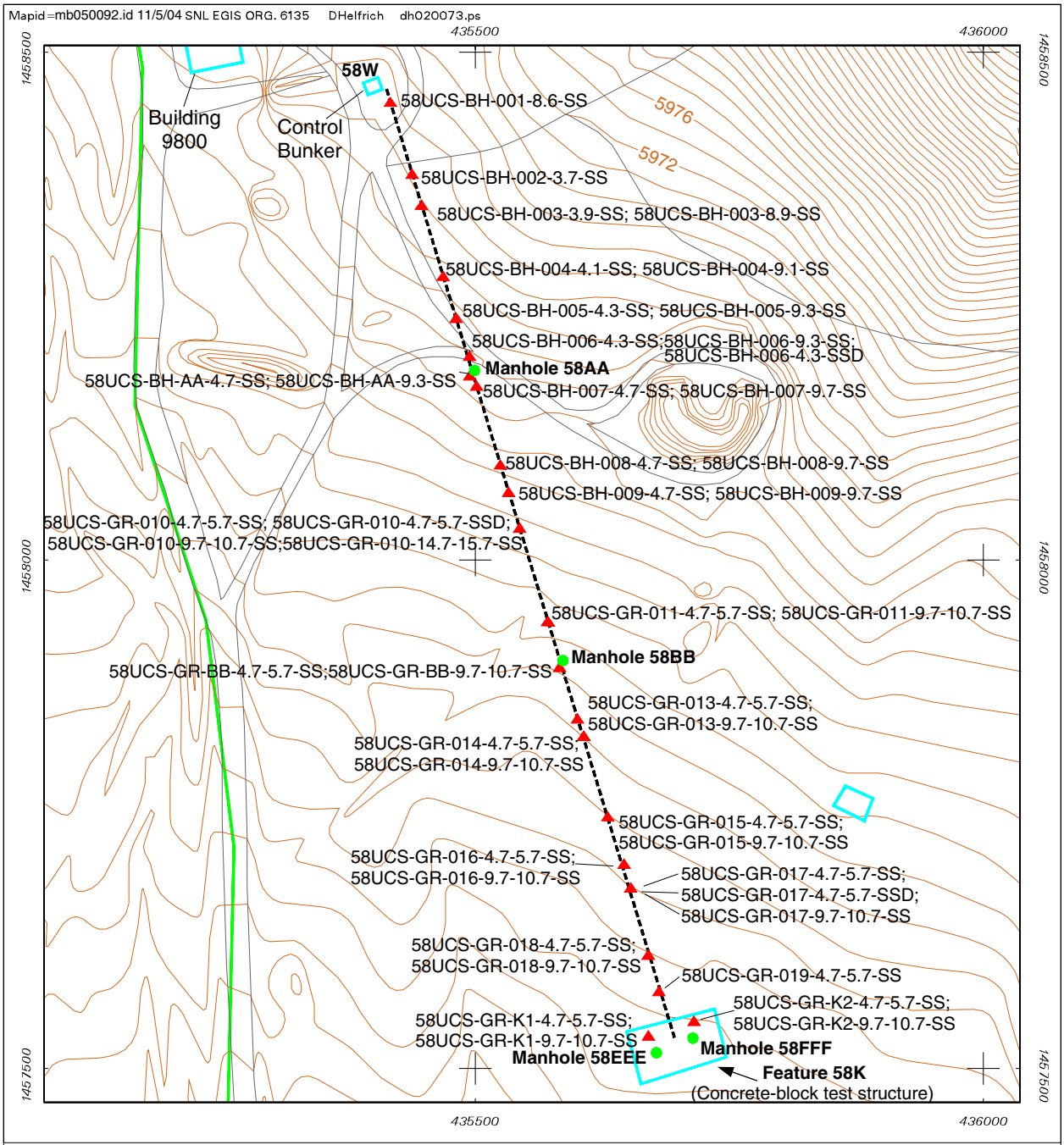

Legend

- Borehole location
- Manhole
- Unpaved Road
- SWMU 8/58 Boundary
- 2-Foot Contour
- Former Underground Conduit System
- Building / Structure

Figure 4.4.2.5-1
Borehole locations at the
Solid Waste Management Unit 58,
Features 58K, 58W, 58AA,
58BB, 58EEE, and 58FFF
(Underground Conduit System)

0 80 160
Scale in Feet

0 19.2 38.4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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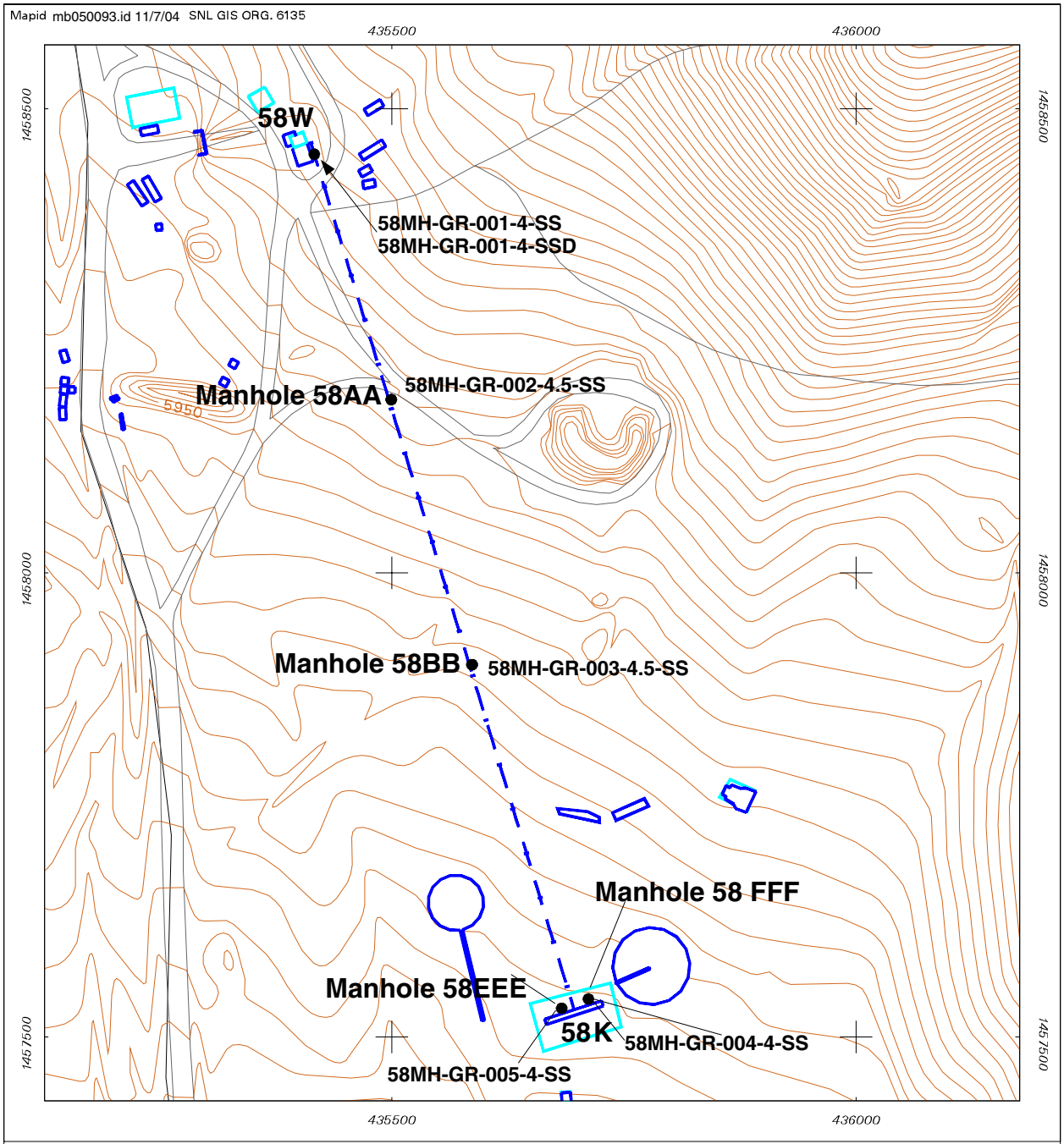

Legend

- Manhole sample location
- Road
- 2-Foot Contour
- Building/Structure
- Physical Feature
- SWMU 8 Boundary
- Former Underground Conduit System

Figure 4.4.2.5-2
Manhole sample locations at the Solid Waste Management Unit 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)

0 87.5 175
Scale in Feet

0 21 42
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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58BB, 58EEE, and 58FFF (Figure 4.4.2.5-1). At each borehole, two samples were collected; 1 sample at approximately 1 foot below the conduit, and another sample about 5 feet below the first sample. At Borehole 58UCS-GR-010, a third sample was collected at 14.7 to 15.7 feet bgs based upon elevated organic vapors detected during field-screening. Because of refusal, a second sample was not collected at borehole 58UCS-GR-019.

A total of 47 soil samples were collected and analyzed for VOCs by GEL. In addition, samples collected from borehole locations within the Radiological Materials Management Area (RMMA) were analyzed for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory. At each RMMA sample location, a sample was collected from two sample depths (typically 4.7 and 9.7 feet bgs), composited, and analyzed for radionuclides.

4.4.2.5.2 Sampling Results for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

To summarize, two radionuclides were detected above the background levels and four VOCs were detected in the soil samples. The analytical results are incorporated into the Risk Assessment for SWMUs 8 and 58 (Annex A).

Tables 4.4.2.5.2-1 and 4.4.2.5.2-2 summarize the VOC analytical results for the surface and subsurface soil samples collected from the UCS. The following results were reported:

- Carbon tetrachloride, the solvent allegedly discharged into the UCS, was not detected in any sample.
- Except for acetone, 2-hexanone, methylene chloride, and toluene, no other VOCs were detected in soil samples collected at the UCS. The slightly elevated concentrations of organic compounds detected in the soil and blank samples could indicate laboratory contamination.

Table 4.4.2.5.2-3 provides the VOC MDLs for soil samples collected at the UCS.

Table 4.4.2.5.2-4 summarizes the on-site gamma spectroscopy analytical results for the RFI samples collected at the UCS. The following detections were reported:

- One sample contained a thorium activity of 1.15 pCi/g above the background limit of 1.03 pCi/g.
- One sample contained a cesium-137 activity of 2.96 pCi/g, compared to a background limit of 1.55 pCi/g.
- Eight samples had uranium-238 MDAs above the approved background activity level of 2.31 pCi/g.
- Ten samples had uranium-235 MDAs above the approved background activity level of 0.16 pCi/g.

Annex C provides the gamma spectroscopy results for all samples collected at the UCS.

Table 4.4.2.5.2-1
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System Manholes)
RFI Soil Sampling, VOC Analytical Results
March 1996
(Off-Site Laboratory)

Sample Attributes					VOC (EPA Method 8240[a]) (μg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Acetone	Methylene Chloride	Toluene	2-Butanone
5000	58MH-GR-001-4-SS	Soil	03-18-96	4	ND (5.0)	**3B**	**1.2 J**	ND (2.00)
5000	58MH-GR-001-4-SSD	Soil	03-18-96	4	ND (5.0)	**3B**	ND (1.00)	ND (2.00)
5000	58MH-GR-002-4.5-SS	Soil	03-18-96	4.5	ND (5.0)	**3B**	**1.2 J**	ND (2.00)
5000	58MH-GR-003-4.5-SS	Soil	03-19-96	4.5	ND (5.0)	**4.2B**	**4.3**	ND (2.00)
5000	58MH-GR-004-4-SS	Soil	03-19-96	4	ND (5.0)	**4.50B**	**4.3**	ND (2.00)
5000	58MH-GR-005-4-SS	Soil	03-19-96	4	ND (5.0)	**4.10B**	**1.6**	ND (2.00)
Quality Assurance/Quality Control Samples (μg/L)								
5000	58MH-GR-005-0.0-TB	Soil	03-19-96	NA	**29.7**	**8.10B**	**1.90 J**	**6.4**
5000	58MH-GR-005-0.0-EB	Water	03-19-96	NA	ND (5.0)	**1.20 JB**	ND (1.00)	ND (2.00)
5000	58MH-GR-005-0.0-TB	Water	03-19-96	NA	ND (5.0)	**1.20 JB**	ND (1.00)	ND (2.00)
5000	58MH-GR-005-0.0-FB	Water	03-19-96	NA	ND (5.0)	**1.10 JB**	ND (1.00)	ND (2.00)

Sample Attributes					VOC (EPA Method 8240[a]) (μg/kg)		
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Xylenes	Bromoform	Chlorodibromo-methane
5000	58MH-GR-001-4-SS	Soil	03-18-96	4	ND (1.00)	ND (1.00)	ND (1.00)
5000	58MH-GR-001-4-SSD	Soil	03-18-96	4	ND (1.00)	ND (1.00)	ND (1.00)
5000	58MH-GR-002-4.5-SS	Soil	03-18-96	4.5	ND (1.00)	ND (1.00)	ND (1.00)
5000	58MH-GR-003-4.5-SS	Soil	03-19-96	4.5	ND (1.00)	ND (1.00)	ND (1.00)
5000	58MH-GR-004-4-SS	Soil	03-19-96	4	ND (1.00)	ND (1.00)	ND (1.00)
5000	58MH-GR-005-4-SS	Soil	03-19-96	4	ND (1.00)	ND (1.00)	ND (1.00)
Quality Assurance/Quality Control Samples (μg/L)							
5000	58MH-GR-005-0.0-TB	Water	03-19-96	NA	**4.1**	ND (1.00)	ND (1.00)
5000	58MH-GR-005-0.0-EB	Water	03-19-96	NA	ND (1.00)	ND (1.00)	ND (1.00)
5000	58MH-GR-005-0.0-TB	Water	03-19-96	NA	ND (1.00)	ND (1.00)	ND (1.00)
5000	58MH-GR-005-0.0-FB	Water	03-19-96	NA	ND (1.00)	**4.2**	**1.20 J**

Refer to footnotes at end of table.

Table 4.4.2.5.2-1 (Concluded)
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System Manholes)
RFI Soil Sampling, VOC Analytical Results
March 1996
(Off-Site Laboratory)

Note: Values in **bold** indicate detected concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
58MH = SWMU 58 Underground Conduit System Manhole.
B = Analyte present in associated blank.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Subsurface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 4.4.2.5.2-2
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
RFI Borehole Soil Sampling, VOC Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					VOC (EPA Method 8240[a]) (μg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Acetone	2-Hexanone	Methylene Chloride	Toluene
04983	58UCS-GR-013-4.7-5.7-SS	Soil	04-08-96	4.7–5.7	ND (5)	ND (5)	ND (2)	ND (1)
04983	58UCS-GR-013-9.7-10.7-SS	Soil	04-08-96	9.7–10.7	ND (5)	ND (5)	ND (2)	ND (1)
04983	58UCS-GR-014-4.7-5.7-SS	Soil	04-08-96	4.7–5.7	ND (5)	ND (5)	ND (2)	ND (1)
04983	58UCS-GR-014-9.7-10.7-SS	Soil	04-08-96	9.7–10.7	ND (5)	ND (5)	ND (2)	ND (1)
04983	58UCS-GR-018-4.7-5.7-SS	Soil	04-08-96	4.7–5.7	ND (5)	ND (5)	ND (2)	ND (1)
04983	58UCS-GR-018-9.7-10.7-SS	Soil	04-08-96	9.7–10.7	ND (5)	ND (5)	ND (2)	ND (1)
04983	58UCS-GR-019-4.7-5.7-SS	Soil	04-08-96	4.7–5.7	ND (5)	ND (5)	ND (2)	ND (1)
04980	58UCS-GR-K1-4.7-5.7-SS	Soil	04-09-96	4.7–5.7	ND (5)	ND (5)	ND (1)	ND (1)
04980	58UCS-GR-K1-9.7-10.7-SS	Soil	04-09-96	9.7–10.7	ND (5)	ND (5)	ND (1)	ND (1)
04980	58UCS-GR-K2-4.7-5.7-SS	Soil	04-09-96	4.7–5.7	ND (5)	**15.7**	ND (1)	ND (1)
04980	58UCS-GR-K2-9.7-10.7-SS	Soil	04-09-96	9.7–10.7	ND (5)	ND (5)	ND (1)	ND (1)
04981	58UCS-GR-017-4.7-5.7-SS	Soil	04-09-96	4.7–5.7	ND (5)	ND (5)	ND (1)	ND (1)
04981	58UCS-GR-017-4.7-5.7-SSD	Soil	04-09-96	4.7–5.7	ND (5)	ND (5)	ND (1)	ND (1)
04981	58UCS-GR-017-9.7-10.7-SS	Soil	04-09-96	9.7–10.7	ND (5)	ND (5)	ND (1)	ND (1)
04981	58UCS-GR-016-4.7-5.7-SS	Soil	04-09-96	4.7–5.7	ND (5)	ND (5)	ND (1)	ND (1)
04981	58UCS-GR-016-9.7-10.7-SS	Soil	04-09-96	9.7–10.7	ND (5)	ND (5)	ND (1)	ND (1)
04981	58UCS-GR-015-4.7-5.7-SS	Soil	04-09-96	4.7–5.7	ND (5)	ND (5)	ND (1)	ND (1)
04981	58UCS-GR-015-9.7-10.7-SS	Soil	04-09-96	9.7–10.7	ND (5)	ND (5)	ND (1)	ND (1)
05086	58UCS-GR-BB-4.7-5.7-SS	Soil	04-10-96	4.7–5.7	**9.99 J**	ND (5)	ND (1)	ND (1)
05086	58UCS-GR-BB-9.7-10.7-SS	Soil	04-10-96	9.7–10.7	**7.75 J**	ND (5)	ND (1)	ND (1)
05086	58UCS-GR-011-4.7-5.7-SS	Soil	04-10-96	4.7–5.7	**8.70 J**	ND (5)	ND (1)	ND (1)
05086	58UCS-GR-011-9.7-10.7-SS	Soil	04-10-96	9.7–10.7	**8.39 J**	ND (5)	ND (1)	ND (1)
05087	58UCS-GR-010-4.7-5.7-SS	Soil	04-11-96	4.7–5.7	ND (5)	ND (5)	**1.19 J**	ND (1)
05087	58UCS-GR-010-4.7-5.7-SSD	Soil	04-11-96	4.7–5.7	ND (5)	ND (5)	**1.34 J**	ND (1)
05087	58UCS-GR-010-9.7-10.7-SS	Soil	04-11-96	9.7–10.7	ND (5)	ND (5)	**1.08 J**	ND (1)
05087	58UCS-GR-010-14.7-15.7-SS	Soil	04-11-96	14.7–15.7	ND (5)	ND (5)	**1.28 J**	ND (1)
05075	58UCS-BH-001-8.6-SS	Soil	04-23-96	8.6–9.6	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-002-3.7-SS	Soil	04-23-96	3.7–4.7	ND (5)	ND (5)	ND (2)	ND (1)

Refer to footnotes at end of table.

Table 4.4.2.5.2-2 (Continued)
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
RFI Borehole Soil Sampling, VOC Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					VOC (EPA Method 8240[a]) (μg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Acetone	2-Hexanone	Methylene Chloride	Toluene
05075	58UCS-BH-003-3.9-SS	Soil	04-23-96	3.9–4.9	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-003-8.9-SS	Soil	04-23-96	8.9–9.9	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-004-4.1-SS	Soil	04-23-96	4.1–5.1	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-004-9.1-SS	Soil	04-23-96	9.1–10.1	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-005-4.3-SS	Soil	04-23-96	4.3–5.3	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-005-9.3-SS	Soil	04-23-96	9.3–10.3	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-006-4.3-SS	Soil	04-23-96	4.3–5.3	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-006-4.3-SSD	Soil	04-23-96	4.3–5.3	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-006-9.3-SS	Soil	04-23-96	9.3–10.3	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-AA-4.7-SS	Soil	04-23-96	4.7–5.7	ND (5)	ND (5)	ND (2)	ND (1)
05075	58UCS-BH-AA-9.7-SS	Soil	04-23-96	9.7–10.7	ND (2)	ND (2)	ND (2)	ND (1)
05076	58UCS-BH-007-4.7-SS	Soil	04-24-96	4.7–5.7	ND (2)	ND (2)	ND (25)	ND (1)
05076	58UCS-BH-007-9.7-SS	Soil	04-24-96	9.7–10.7	ND (2)	ND (2)	ND (25)	ND (1)
05076	58UCS-BH-008-4.7-SS	Soil	04-24-96	4.7–5.7	ND (2)	ND (2)	ND (25)	ND (1)
05076	58UCS-BH-008-9.7-SS	Soil	04-24-96	9.7–10.7	ND (2)	ND (2)	ND (25)	ND (1)
05076	58UCS-BH-009-4.7-SS	Soil	04-24-96	4.7–5.7	ND (2)	ND (2)	ND (25)	ND (1)
05076	58UCS-BH-009-9.7-SS	Soil	04-24-96	9.7–10.7	ND (2)	ND (2)	ND (25)	ND (1)
Quality Assurance/Quality Control Samples (μg/L)								
05076	58UCS-BH-009-FB	Water	04-24-96	NA	ND (2)	ND (2)	**1 J**	ND (1)
05076	58UCS-BH-009-EB	Water	04-24-96	NA	ND (2)	ND (2)	**1 J**	ND (1)
05076	58UCS-BH-009-TB	Water	04-24-96	NA	ND (2)	ND (2)	**1.30 J**	ND (1)
05076	58UCS-BH-009-SB	Soil[c]	04-24-96	NA	**48.0 J**	ND (2)	ND (25)	**6.20 J**
04981	58UCS-GR-015-FB	Water	04-09-96	NA	**5.26 J**	ND (5)	ND (1)	ND (1)
04981	58UCS-GR-015-EB	Water	04-09-96	NA	ND (5)	ND (5)	**1.10 J**	ND (1)
04981	58UCS-GR-015-TB	Water	04-09-96	NA	ND (5)	ND (5)	**1.50 J**	ND (1)
04981	58UCS-GR-015-SB	Soil[c]	04-09-96	NA	**77.4**	ND (5)	**9.98B**	**4.65**
04983	58UCS-GR-019-FB	Water	04-08-96	NA	ND (5)	ND (5)	ND (1)	ND (1)
04983	58UCS-GR-019-EB	Water	04-08-96	NA	ND (5)	ND (5)	ND (1)	ND (1)
04983	58UCS-GR-019-TB	Water	04-08-96	NA	ND (5)	ND (5)	ND (1)	ND (1)

Refer to footnotes at end of table.

Table 4.4.2.5.2-2 (Concluded)
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
RFI Borehole Soil Sampling, Volatile Organic Compounds Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					VOC (EPA Method 8240[a]) (μg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Acetone	2-Hexanone	Methylene Chloride	Toluene
04983	58UCS-GR-019-SB	Soil[c]	04-08-96	NA	**6.20 J**	ND (5)	**5.20B**	**1.50 J**
05075	58UCS-BH-AA-SB	Soil[c]	04-23-96	NA	ND (2)	ND (2)	ND (25)	**2.40 J**

Note: Values in **bold** indicate detected concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Soil Blank units (μg/kg).
58UCS = SWMU 58 Underground Conduit System.
B = Analyte present in associated blank.
BH = Borehole.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SB = Soil Blank.
SS = Subsurface soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 4.4.2.5.2-3
Summary of VOC Analytical MDLs for SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) RFI Soil Sampling
March-April 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8240[a]) (μg/kg)
Acetone	5.00
Benzene	1.00
Bromodichloromethane	1.00
Bromoform	1.00
Bromomethane	1.00
2-Butanone	5.00
Carbon Disulfide	5.00
Carbon Tetrachloride	1.00
Chlorobenzene	1.00
Chloroethane	1.00
Chloroform	1.00
Chloromethane	1.00
Dibromochloromethane	1.00
1,1-Dichloroethane	1.00
1,2-Dichloroethane	1.00
1,1-Dichloroethene	1.00
cis-1,2-Dichloroethylene	1.00
trans-1,2-Dichloroethylene	1.00
1,2-Dichloropropane	1.00
cis-1,3-Dichloropropylene	1.00
trans-1,3-Dichloropropylene	1.00
Ethylbenzene	1.00
2-Hexanone	5.00
4-Methyl-2-Pentanone	5.00
Methylene Chloride	5.00
Styrene	1.00
1,1,2,2-Tetrachloroethane	1.00
Tetrachloroethene	1.00
Toluene	1.00
1,1,1-Trichloroethane	1.00
1,1,2-Trichloroethane	1.00
Trichloroethene	1.00
Vinyl Acetate	5.00
Vinyl Chloride	1.00
Xylene (Total)	3.00

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 4.4.2.5.2-4
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March-April 1996
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
04959	58UCS-GR-017-4.7-SS	Soil	04-09-96	4.7–5.7	0.0186	0.0153	0.737	0.360
04959	58UCS-GR-016-4.7-SS	Soil	04-09-96	4.7–5.7	ND (0.0402)	--	0.945	0.474
04959	58UCS-GR-015-4.7-SS	Soil	04-09-96	4.7–5.7	0.0305	0.0286	0.890	0.414
04999	58MH-GR-001-4-SS	Soil	03-18-96	4.0–5.0	0.175	0.0333	0.508	0.273
04999	58MH-GR-002-4.5-SS	Soil	03-18-96	4.5–5.5	0.143	0.0384	0.711	0.345
04999	58MH-GR-003-4.5-SS	Soil	03-18-96	4.5–5.5	0.193	0.0446	0.542	0.298
04999	58MH-GR-004-4-SS	Soil	03-18-96	4.0–5.0	1.40	0.193	0.904	0.471
04999	58MH-GR-005-4-SS	Soil	03-18-96	4.0–5.0	**2.96**	0.418	**1.15**	0.572
05088	58UCS-GR-BB-4.7-SS	Soil	04-10-96	4.7–5.7	0.144	0.0278	0.676	0.341
05088	58UCS-GR-011-4.7-SS	Soil	04-10-96	4.7–5.7	0.0105	0.0135	0.772	0.356
05089	58UCS-GR-011-4.7-SS	Soil	04-11-96	4.7–5.7	ND (0.0376)	--	0.785	0.373
Background Soil Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA
Quality Assurance/Quality Control Samples (pCi/L)								
04959	58UCS-GR-015-FB	Water	04-09-96	NA	ND (0.0231)	NA	ND (0.125)	NA

Refer to footnotes at end of table.

Table 4.4.2.5.2-4 (Concluded)
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
RFI Soil Sampling, Gamma Spectroscopy Analytical Results
March-April 1996
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error
04959	58UCS-GR-017-4.7-SS	Soil	04-09-96	4.7–5.7	**ND (0.208)**	--	**ND (2.96)**	--
04959	58UCS-GR-016-4.7-SS	Soil	04-09-96	4.7–5.7	**ND (0.179)**	--	ND (1.19)	--
04959	58UCS-GR-015-4.7-SS	Soil	04-09-96	4.7–5.7	**ND (0.205)**	--	**ND (2.95)**	--
04999	58MH-GR-001-4-SS	Soil	03-18-96	4.0–5.0	ND (0.131)	--	ND (0.840)	--
04999	58MH-GR-002-4.5-SS	Soil	03-18-96	4.5–5.5	**ND (0.224)**	--	**ND (3.24)**	--
04999	58MH-GR-003-4.5-SS	Soil	03-18-96	4.5–5.5	**ND (0.168)**	--	ND (1.10)	--
04999	58MH-GR-004-4-SS	Soil	03-18-96	4.0–5.0	0.0943	0.0883	**ND (4.58)**	--
04999	58MH-GR-005-4-SS	Soil	03-18-96	4.0–5.0	**ND (0.254)**	--	ND (1.24)	--
05088	58UCS-GR-BB-4.7-SS	Soil	04-10-96	4.7–5.7	**ND (0.202)**	--	**ND (2.94)**	--
05088	58UCS-GR-011-4.7-SS	Soil	04-10-96	4.7–5.7	**ND (0.195)**	--	**ND (2.76)**	--
05089	58UCS-GR-011-4.7-SS	Soil	04-11-96	4.7–5.7	**ND (0.233)**	--	**ND (3.61)**	--
Background Soil Activities—Lower Canyons Area[d]		NA	NA	NA	0.16	NA	2.31	NA
Quality Assurance/Quality Control Samples (pCi/L)								
04959	58UCS-GR-015-FB	Water	04-09-96	NA	ND (0.103)	NA	ND (0.534)	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.

58UCS = SWMU 58 Underground Conduit System.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/L = Picocurie(s) per liter.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

4.4.2.5.2.1 Data Quality Results for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

This section discusses the results of the QA/QC samples that were collected during the RFI at the UCS. The QA/QC samples collected during the 1996 sampling event included four duplicate, four EB, four FB, five TB, and four SB samples. The EB/FB/TB/SB samples were analyzed for VOCs; one FB was analyzed for radionuclides by gamma spectroscopy.

Except for methylene chloride (a common laboratory contaminant), primary and duplicate samples analyzed for VOCs yielded nondetections for all samples. Therefore, RPDs were not calculated.

Data Validation Results for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

The off-site laboratory results from GEL were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

4.4.2.6 SWMU 58E (Earth Mound)

SWMU 58E (Earth Mound) was reportedly installed to protect Building 9800 from shrapnel produced by explosive tests conducted in the Shot Tank (SWMU 58F). Debris from other tests may also be buried in the mound. The RFI investigation at the Earth Mound included surface geophysics, trenching, and soil sampling performed in 1995 and 1996.

4.4.2.6.1 Sampling Activities at SWMU 58E (Earth Mound)

Sampling activities were conducted at the Earth Mound as described in Section 5.3 of the OU 1332 RFI Work Plan (SNL/NM June 1995). Initially, a surface geophysical survey was performed over the mound area to identify any anomalies (e.g., buried metal objects). Judgmental samples were then collected from areas containing anomalies in and around the mound (Figure 4.4.2.6.1-1).

Soil Sampling

Thirty soil samples were collected from the following locations: 1) under the metal fragments found at the mound (locations designated 58EM), 2) within the three trenches excavated through the mound (locations designated 58-M), and 3) at the surface along the edge of the mound (locations designated 58EM) (Figure 4.4.2.6.1-1). Samples were collected from the surface to 14 feet bgs in the trenches. Only one sample location showed slightly elevated radioactivity during field-screening, and a sample was collected at this location and analyzed for radionuclides by gamma spectroscopy.

840857 06040000 B1

435200

435300

1458200

1458100

58EM-GR-007-0-SS

58EM-GR-008-0-SS

58-M-T1-2-S
58-M-T1-3-S
58-M-T1-4-S

58EM-GR-006-0-SS

58-M-T1S-1-S **(COC 05167)**
58-M-T1S-1-R

58-M-T1S-1-S **(COC 05166)**
58-M-T1S-1-SD

58EM-GR-004-0-SS

58-M-T2S-2-S
58-M-T2S-2-SD
58-M-T2S-5-R
58-M-T2S-5-S
58-M-T2S-8-S
58-M-T2S-7-S
58-M-T2S-14-S

58EM-GR-001-0-DU
58EM-GR-001-0-SS

58-M-T3N-2-S
58-M-T3N-2-SD
58-M-T3N-4-R
58-M-T3N-4-S
58-M-T3N-10-S
58-M-T3N-14-S
58-M-T3S-12-S

58EM-GR-003-0-SS

58EM-GR-002-0-SS

58EM-GR-005-0-SS

5948

5954

5944

Trench Locations

SWMU 58

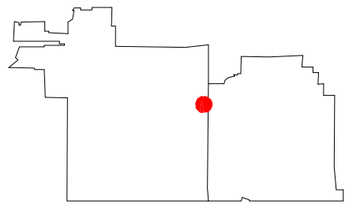
SWMU 8

Legend

- Surface / trench sample location
- KAFB Road
- SWMU Boundary
- Trench
- 2-Foot Contour

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters



Sandia National Laboratories, New Mexico
Environmental Operations Geographic Information System

Figure 4.4.2.6.1-1
Surface and trench sample locations at Feature 58E, Earth Mound

Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone, 1927 North American Horizontal Datum, 1929 North American Vertical Datum

MAPID=010912

Unclassified	mb050081.id	SNL GIS ORG. 6135
DHelfrich	dh010912.aml	11/6/04

All samples were analyzed for metals on site at ERCL and off site at GEL, and one sample was analyzed for radionuclides at the SNL/NM RPSD Laboratory.

Metal Fragment Sampling

Three metal fragments were found and sampled from the Earth Mound. The fragment samples were analyzed on site for metals.

4.4.2.6.2 Sampling Results

To summarize, five metals were detected above the background levels. The analytical results are incorporated into the Risk Assessment SWMUs 8 and 58 (Annex A).

Table 4.4.2.6.2-1 summarizes the metals analytical results for the soil samples collected from the Earth Mound. Except for the 1996 samples analyzed on site (with nondetections at MDLs above the background limits), all samples were below the background limits for arsenic, barium, beryllium, chromium, lead, nickel, and zinc. The following detections were reported:

- One sample contained cadmium at a concentration of 0.68 mg/kg. The background limit for cadmium is 0.64 mg/kg.
- Three samples contained mercury at concentrations ranging from 0.28 to 0.42 mg/kg, compared to a background limit of 0.055 mg/kg.
- Two samples contained elevated selenium levels of 56J to 79J mg/kg, compared to a background limit of 2.7 mg/kg.
- Two samples contained silver at a concentration of 8.5 mg/kg, compared to a background limit of less than 0.5 mg/kg.
- One sample contained copper at a concentration of 440 mg/kg, compared to the background limit of 17.1 mg/kg.

Table 4.4.2.6.2-2 summarizes the results of gamma spectroscopy analysis for radionuclides for the one sample collected at the Earth Mound. With the exception of uranium-235, the activities were below approved background activities; the MDA for uranium-235 exceeded the background activity.

Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

4.4.2.6.3 Data Quality Results for SWMU 58E (Earth Mound)

QA/QC field samples collected as part of the RFI soil sampling at the Earth Mound included three duplicate, three EB, and three FB samples.

Table 4.4.2.6.2-1
Summary of SWMU 58, Feature 58E (Earth Mound) RFI Soil Sampling Metals Analytical Results
May 1996 and February 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
05166	58-M-T1S-1-S	Soil	05-28-96	1–1.5	ND (26)	140	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T1S-1-SD	Soil	05-28-96	1–1.5	ND (26)	140	ND (0.11)	**ND (2.1)**	6.6 J (19)	**460**
05166	58-M-T1-2-S	Soil	05-28-96	2–2.5	**ND (26)**	130	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T1-3-S	Soil	05-28-96	3–3.5	**ND (26)**	140	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T1-4-S	Soil	05-28-96	4–4.5	**ND (26)**	130	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T1S-1-R[c]	Soil	05-28-96	1–1.5	**ND (26)**	130	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T2S-2-S	Soil	05-29-96	2–2.5	**ND (26)**	140	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T2S-2-SD	Soil	05-29-96	2–2.5	**ND (26)**	130	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T2S-5-R[d]	Soil	05-29-96	5–5.5	ND (26)	120	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T2S-8-S	Soil	05-29-96	8–8.5	**ND (26)**	100	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T2S-7-S	Soil	05-29-96	7–7.5	**ND (26)**	150	ND (0.11)	**ND (2.1)**	8 J	**440**
05166	58-M-T2S-14-S	Soil	05-29-96	14–14.5	**ND (26)**	150	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T3N-2-S	Soil	05-29-96	2–2.5	**ND (26)**	150	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T3N-2-SD	Soil	05-29-96	2–2.5	**ND (26)**	130	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T3N-4-R[e]	Soil	05-29-96	4–4.5	ND (26)	120	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T3N-10-S	Soil	05-30-96	10–10.5	**ND (26)**	94	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T3N-14-S	Soil	05-30-96	14–14.5	**ND (26)**	120	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05166	58-M-T3S-12-S	Soil	05-30-96	12–12.5	**ND (26)**	110	ND (0.11)	**ND (2.1)**	ND (5)	**ND (20)**
05167	58-M-T1S-1-S	Soil	05-28-96	0–0.5	3.51	137	0.55	ND (0.0096)	11.6	13.3
05167	58-M-T2S-5-S	Soil	05-29-96	4–4.5	3.07	102	0.416 J (0.495)	ND (0.0096)	8.70	11.3
05167	58-M-T3N-4-S	Soil	05-29-96	3–3.5	3.20	108	0.447 J (0.495)	ND (0.0096)	8.72	10.9
04972	58EM-GR-001-0-SS	Soil	02-11-97	0–0.5	2.7	120	0.52	0.18 J (0.32)	14	14
04972	58EM-GR-002-0-SS	Soil	02-11-97	0–0.5	3.4	220 J	0.41	0.12 J (0.32)	9.1	8.8
04972	58EM-GR-003-0-SS	Soil	02-11-97	0–0.5	2.8	170	0.49	0.2 J (0.32)	12	10
04972	58EM-GR-004-0-SS	Soil	02-11-97	0–0.5	2.4	100	0.44	0.14 J (0.32)	9	10
04972	58EM-GR-005-0-SS	Soil	02-11-97	0–0.5	2.3	100	0.48	0.19 J (0.32)	12	11
NMED-Approved Background Values—Canyons Area[f]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Refer to footnotes at end of table.

Table 4.4.2.6.2-1 (Continued)
Summary of SWMU 58, Feature 58E (Earth Mound) RFI Soil Sampling Metals Analytical Results
May 1996 and February 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
04972	58EM-GR-006-0-SS	Soil	02-11-97	0–0.5	2.4	110	0.48	**0.68**	12	12
04972	58EM-GR-007-0-SS	Soil	02-11-97	0–0.5	1.9 J (2)	88	0.41	0.17 J (0.32)	9.7	13
04972	58EM-GR-008-0-SS	Soil	02-11-97	0–0.5	2.2	120	0.51	0.19 J (0.32)	12	16
04972	58EM-GR-001-0-DU	Soil	02-11-97	0–0.5	2.5	110	0.52	0.16 J (0.32)	12	11
NMED-Approved Background Values—Canyons Area[f]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
04972	58EM-GR-010-EB	Water	02-11-97	NA	ND (0.5)	1.4 J (4)	ND (0.014)	0.098 J (0.32)	ND (1.8)	**6.6**
05167	58-M-T3N-EB	Water	05-30-96	NA	ND (0.00186)	0.00163 J (0.01)	ND (0.0000114)	ND (0.000097)	ND (0.000596)	0.00246 J (0.01)
05167	58-M-T2S-EB	Water	05-29-96	NA	ND (0.00186)	0.00112 J (0.01)	0.0000139 J (0.005)	ND (0.000097)	0.00173 J (0.01)	0.00622 J (0.01)
04972	58EM-GR-010-FB	Water	02-11-97	NA	ND (0.5)	ND (1)	ND (0.014)	0.095 J (0.32)	ND (1.8)	2.8 J (3)
05167	58-M-T3N-FB	Water	05-30-96	NA	ND (0.00186)	0.000191 J (0.01)	0.0000139 J (0.005)	ND (0.000097)	ND (0.000596)	0.00214 J (0.01)
05167	58-M-T2S-FB	Water	05-29-96	NA	ND (0.00186)	0.000146 J (0.01)	0.0000346 J (0.005)	ND (0.000097)	ND (0.000596)	0.00107 J (0.01)

Refer to footnotes at end of table.

Table 4.4.2.6.2-1 (Continued)
Summary of SWMU 58, Feature 58E (Earth Mound) RFI Soil Sampling Metals Analytical Results
May 1996 and February 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
05166	58-M-T1S-1-S	Soil	05-28-96	1–1.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	24 J (38)
05166	58-M-T1S-1-SD	Soil	05-28-96	1–1.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	30 J (38)
05166	58-M-T1-2-S	Soil	05-28-96	2–2.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	23 J (38)
05166	58-M-T1-3-S	Soil	05-28-96	3–3.5	ND (3.4)	**0.34**	ND (4)	**56 J (191)**	**ND (1.7)**	27 J (38)
05166	58-M-T1-4-S	Soil	05-28-96	4–4.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	47
05166	58-M-T1S-1-R[c]	Soil	05-28-96	1–1.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	27 J (38)
05166	58-M-T2S-2-S	Soil	05-29-96	2–2.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	20 J (38)
05166	58-M-T2S-2-SD	Soil	05-29-96	2–2.5	ND (3.4)	**0.28**	ND (4)	**ND (50)**	**ND (1.7)**	16 J (38)
05166	58-M-T2S-5-R[d]	Soil	05-29-96	5–5.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	17 J (38)
05166	58-M-T2S-8-S	Soil	05-29-96	8–8.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	14 J (38)
05166	58-M-T2S-7-S	Soil	05-29-96	7–7.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**8.5**	16 J (38)
05166	58-M-T2S-14-S	Soil	05-29-96	14–14.5	ND (3.4)	**ND (0.06)**	ND (4)	**79 J**	**8.5**	ND (10)
05166	58-M-T3N-2-S	Soil	05-29-96	2–2.5	ND (3.4)	**0.42**	ND (4)	**ND (50)**	**ND (1.7)**	18 J (38)
05166	58-M-T3N-2-SD	Soil	05-29-96	2–2.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	17 J (38)
05166	58-M-T3S-4-R[e]	Soil	05-29-96	4–4.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	24 J (38)
05166	58-M-T3N-10-S	Soil	05-30-96	10–10.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	21 J (38)
05166	58-M-T3N-14-S	Soil	05-30-96	14–14.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	20 J (38)
05166	58-M-T3S-12-S	Soil	05-30-96	12–12.5	ND (3.4)	**ND (0.06)**	ND (4)	**ND (50)**	**ND (1.7)**	25 J (38)
05167	58-M-T1S-1-S	Soil	05-28-96	0–0.5	10	0.0219 J (0.0322)	10.4	0.269 J (0.495)	ND (0.247)	48.2
05167	58-M-T2S-5-S	Soil	05-29-96	4–4.5	7.39	0.0227 J (0.0302)	8.28	0.310 J (0.495)	ND (0.247)	27.4
05167	58-M-T3N-4-S	Soil	05-29-96	3–3.5	7.52	0.0148 J (0.029)	8.91	ND (0.142)	ND (0.247)	28.7
04972	58EM-GR-001-0-SS	Soil	02-11-97	0–0.5	9	0.017 J (0.064)	11	ND (0.5)	0.044 J (0.096)	36
04972	58EM-GR-002-0-SS	Soil	02-11-97	0–0.5	6.1	0.019 J (0.064)	9.3	ND (0.5)	0.029 J (0.096)	30
04972	58EM-GR-003-0-SS	Soil	02-11-97	0–0.5	8	ND (0.016)	9.4	ND (0.5)	0.036 J (0.096)	31
04972	58EM-GR-004-0-SS	Soil	02-11-97	0–0.5	8.3	ND (0.016)	9.1	ND (0.5)	0.035 J (0.096)	31
04972	58EM-GR-005-0-SS	Soil	02-11-97	0–0.5	8	ND (0.016)	9	ND (0.5)	0.034 J (0.096)	32
NMED-Approved Background Values—Canyons Area[f]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1

Refer to footnotes at end of table.

Table 4.4.2.6.2-1 (Continued)
Summary of SWMU 58, Feature 58E (Earth Mound) RFI Soil Sampling Metals Analytical Results
May 1996 and February 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
04972	58EM-GR-006-0-SS	Soil	02-11-97	0–0.5	8.3	ND (0.016)	9.7	ND (0.5)	0.051 J (0.096)	35
04972	58EM-GR-007-0-SS	Soil	02-11-97	0–0.5	8.4	ND (0.016)	8.1	ND (0.5)	0.043 J (0.096)	35
04972	58EM-GR-008-0-SS	Soil	02-11-97	0–0.5	8.8	ND (0.016)	9.5	ND (0.5)	0.076 J (0.096)	38
04972	58EM-GR-001-0-DU	Soil	02-11-97	0–0.5	9	0.019 J (0.064)	9.8	ND (0.5)	0.042 J (0.096)	35
NMED-Approved Background Values—Canyons Area[f]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)										
04972	58EM-GR-010-EB	Water	02-11-97	NA	0.56 J (0.44)	ND (0.016)	0.72 J (0.68)	ND (0.5)	ND (0.024)	8.3 J (20)
05167	58-M-T3N-EB	Water	05-30-96	NA	ND (0.00113)	ND (0.0000148)	ND (0.000807)	ND (0.00143)	ND (0.00249)	ND (0.00270)
05167	58-M-T2S-EB	Water	05-29-96	NA	ND (0.00113)	0.0000150 J (0.0002)	0.00108 J (0.01)	ND (0.00143)	ND (0.00249)	0.00728 J (0.02)
04972	58EM-GR-010-FB	Water	02-11-97	NA	ND (0.11)	0.021 J (0.064)	0.36 J (0.68)	0.62 J (2)	ND (0.024)	ND (5)
05167	58-M-T3N-FB	Water	05-30-96	NA	ND (0.00113)	0.0000290 J (0.0002)	ND (0.000807)	ND (0.00143)	ND (0.00249)	ND (0.00270)
05167	58-M-T2S-FB	Water	05-29-96	NA	ND (0.00113)	ND (0.0000148)	ND (0.000807)	ND (0.00143)	ND (0.00249)	ND (0.00270)

Refer to footnotes at end of table.

Table 4.4.2.6.2-1 (Concluded)
Summary of SWMU 58, Feature 58E (Earth Mound) RFI Soil Sampling Metals Analytical Results
May 1996 and February 1997
(On- and Off-Site Laboratories)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]58-M-T1S-1-R is a replicate of 58-M-T1S-1-S, and was analyzed at an off-site laboratory.
[d]58-M-T2S-5-R is a replicate of 58-M-T2S-5-S, and was analyzed at an off-site laboratory.
[e]58-M-T3N-4-R is a replicate of 58-M-T3N-4-S, and was analyzed at an off-site laboratory.
[f]Garcia November 1998.
58M = SWMU 58, Earth Mound (Feature E).
DU = Duplicate sample.
EB = Equipment blank.
58EM = SWMU 58, Earth Mound (Feature E).
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
J = Estimated concentration.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND () = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
R = Replicate sample.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Subsurface soil sample.
SD = Soil sample duplicate.
SS = Soil sample.
SWMU = Solid Waste Management Unit.
T1 = Trench No. 1.
T2 = Trench No. 2.
T3 = Trench No. 3.
T1S = Trench No. 1, South End.
T2S = Trench No. 2 South End.
T3N = Trench No. 3 North End.
T3S = Trench No. 3, South End.

Table 4.4.2.6.2-2
Summary of SWMU 58, Feature 58E (Earth Mound) RFI Soil Sampling, Gamma Spectroscopy Analytical Results
February 1997
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)							
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
					Result	Error	Result	Error[c]	Result	Error	Result	Error[c]
04973	58EM-GR-006-0-SS	Soil	02-11-97	0–0.5	0.0455	0.0346	0.701	0.374	**ND (0.170)**	--	ND (1.16)	--
Background Soil Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.

[a]Uranium-238 and Thorium-232 decay chain isotopes with a short half-life are not presented in this table.

[b]Analysis request/chain-of-custody record.

[c]Two standard deviations about the mean activity.

[d]Dinwiddie September 1997.

ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

The EB samples were analyzed on and off site for metals. Metal concentrations were greater than the MDLs for barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, and zinc. The concentrations of barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, and zinc were below the PQL, and the results were qualified as J (estimated). No QA/QC samples were collected for radionuclide analyses.

The FB samples were analyzed on and off site for metals. The metal concentrations for barium, beryllium, cadmium, copper, mercury, nickel, and selenium were slightly greater than the MDLs, and the results for barium, beryllium, cadmium, copper, mercury, nickel, and selenium were qualified as J (estimated). No QA/QC samples were collected for radionuclide analyses.

RPDs were calculated for metals detected in the primary and duplicate samples, which were analyzed on site and at GEL. All of the metals analyses for the sample pairs yielded RPDs that were within the acceptable RPD limit of less than 25 percent (Table 4.4.2.6.2-3).

Data Validation Results for SWMU 58E (Earth Mound)

The off-site laboratory results from GEL were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For AR/COC 05167, validation qualifications were applied to the metal data for soil and aqueous sample results. Barium and beryllium were detected in the aqueous method blank, and the results were qualified as estimated for the FB and EB samples. Mercury was detected in the soil method blank and the soil sample results were qualified as estimated. No other sample results were qualified.

4.4.2.7 SWMU 58–Miscellaneous Sites

Several features were investigated at SWMU 58 that were not addressed in the OU 1332 RFI Work Plan (SNL/NM June 1995). The following features are collectively shown in Figure 2.1-3:

- Mounds and trenches located throughout the site
- SWMUs 58XX and 58YY (Concrete Pads Nos. 2 and 1, respectively)
- SWMU 58WW (Three Poles and Metal Pipe)
- SWMUs 58OO, 58SS, and 58ZZ (Open Boreholes)
- SWMU 58AAA (Building 9800 Drywell)
- SWMU 58CCC (Building 9805 Drainpipe)

These features were identified during RFI field activities conducted from 1996 through 1998. Tests and/or operations at these features may have generated metals, VOCs, SVOCs, HE

Table 4.4.2.6.2-3
Summary of SWMU 58, Feature 58E (Earth Mound) Field Duplicate Relative Percent Difference Values
May 1996—February 1997
(On- and Off-Site Laboratories)

Sample Attributes			Metals Relative Percent Difference										
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Mercury	Nickel	Lead	Selenium	Silver	Zinc
5166	58-M-T2S-2-S 58-M-T2S-2-SD	2.0–2.5	NC	7.41	NC	NC	NC	NC	NC	NC	NC	NC	22.22
5166	58-M-T3N-2-S 58-M-T3N-2-SD	2.0–2.5	NC	14.29	NC	NC	NC	NC	NC	NC	NC	NC	5.71
4972	58EM-GR-001-0-SS 58EM-GR-001-0-DU	0–0.5	7.69	8.70	0	12.32	15.38	11.11	11.54	0	NC	4.65	2.82

[a]Analysis request/chain-of-custody record.
58EM = SWMU 58, Earth Mound (Feature E).
58M = SWMU 58, Earth Mound (Feature E).
DU = Duplicate sample.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NC = Not calculated for nondetect results or laboratory estimated values.
S = Subsurface soil sample.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
T2S = Trench No. 2, South End.
T3N = Trench No. 3, North End.

compounds, and radionuclides. SNL/NM staff consulted with the NMED (Mignardot November 1998), and a decision was made between SNL/NM ER and NMED staff to investigate these features. This section discusses field investigations at these features.

4.4.2.7.1 Investigation and/or Sampling Activities at SWMU 58—Miscellaneous Sites

Mounds and Trenches

Exploratory trenching was conducted at 25 mound features and 12 surface depression features throughout SWMU 58 (Figure 4.4.2.7.1-1). The trenching was conducted from December 9 to December 22, 1998, and was performed using a backhoe and shovels. The approximate location of and number of cuts excavated through each mound or depression is illustrated in Figure 4.4.2.7.1-1.

Before trenching activities took place at a particular feature, the feature was visually inspected and surveyed with a metal detector to determine whether buried metal objects were present. Table 4.4.2.7.1-1 presents the debris found during trenching activities. No debris was found at 14 of the 25 mound features and 11 of the 12 depression features. No stained soil was found in any of the mound or depression features.

SWMUs 58YY and 58XX (Concrete Pads Nos. 1 and 2)

Two concrete pads were found and investigated during RFI field investigations at SWMU 58, and the pads were identified as SWMUs 58YY (Concrete Pad No. 1) and 58XX (Concrete Pad No. 2). Their exact locations, relative to other pads/structures at SWMU 58, are shown in Figure 2.1.3.

After consultation with NMED staff, one surface soil sample was collected from the downgradient side of each feature (Figures 4.4.2.7.1-2 and 4.4.2.7.1-3) (Mignardot November 1998). The samples were analyzed for metals and HE compounds at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

SWMU 58WW (Three Poles and Metal Pipe)

SWMU 58WW (three wooden poles and metal pipe) is located in the central portion of SWMU 58 (see Figure 2.1.3 for the exact location of SWMU 58WW in relation to other features at SWMU 58). The testing associated with this feature is unknown.

The feature consisted of three upright, wooden telephone poles placed in a triangular pattern with a metal pipe installed between the poles (Figure 4.4.2.7.1-4). The metal pipe, in a concrete foundation 1 by 1 foot in size, measures 3.5 inches in diameter. The poles were removed during housekeeping activities.

One RFI surface soil sample was collected adjacent to the pipe. The sample was analyzed for metals and HE compounds at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

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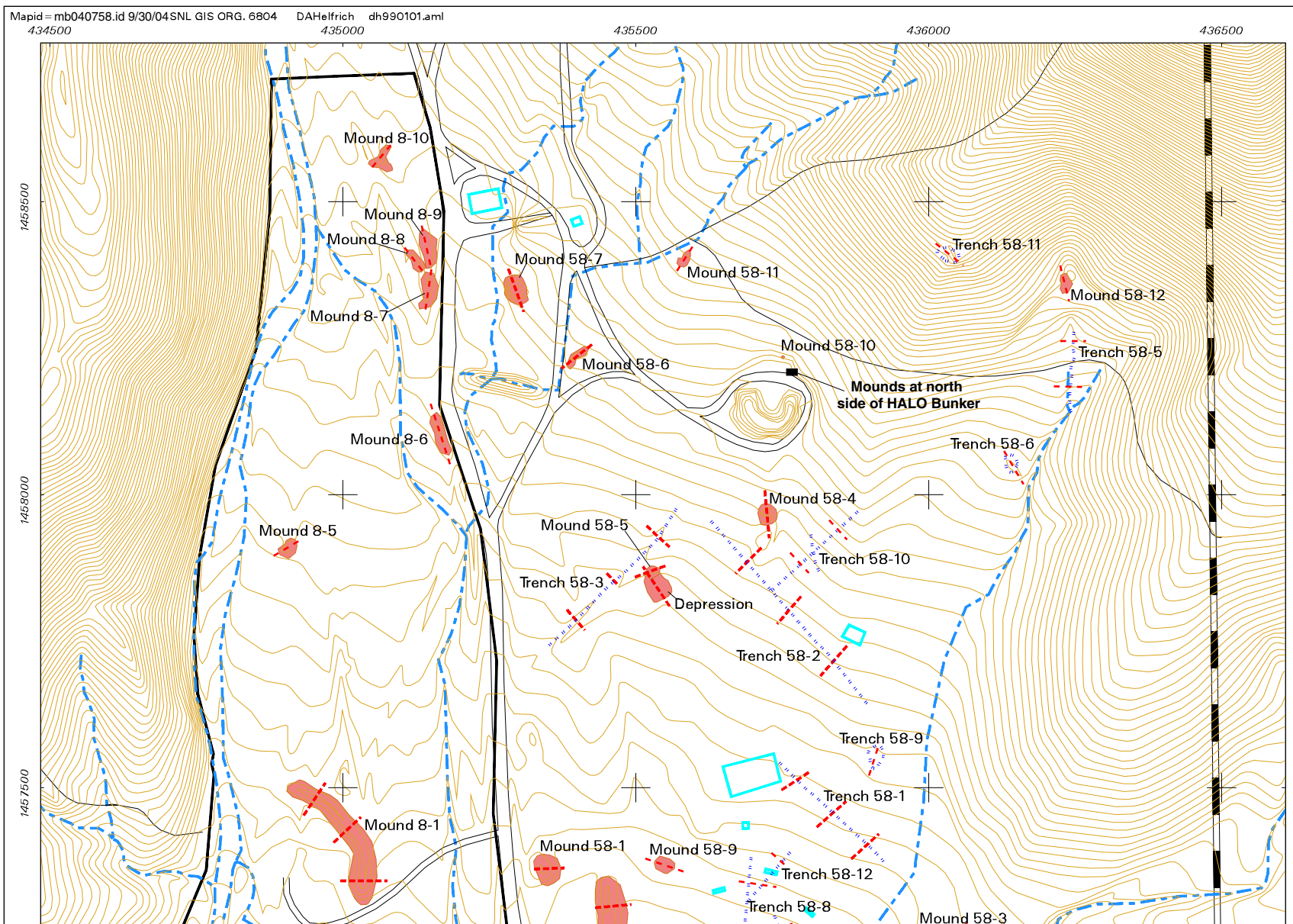

Legend

- Road
- 2-Foot Contour
- Surface Drainage
- Excavated trench
- Existing trench feature
- SWMU 8/58 Boundary
- KAFB/USFS Withdrawn Area Boundary
- Building / Structure
- Mound feature

Figure 4.4.2.7.1-1
Excavation locations at mound and trench features located at Solid Waste Management Unit 58

0 250 500
Scale in Feet
0 60 120
Scale in Meters

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Environmental Geographic Information System

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Table 4.4.2.7.1-1
Debris Found During Exploratory Trenching at SWMU 58
December 1998

Feature[a]	Debris Found	Comments
Mound 8-1	Three strands of wire (red-, pink-, and white-colored) found in central cut through mound	Removed and disposed of as non-regulated waste
Mound 8-7	Communications cable found in single cut through mound	The cable was not live and was not removed
Mound 58-2	Bundle of black-colored communication wire found in south cut through mound	Removed and disposed of as non-regulated waste
Mound 58-3	Single strand of white-colored wire found in single cut through mound	
Mound 58-7	Single strand of black-colored wire, few pieces of strap metal, minor concrete chunks found in single cut through mound	
Mound 58-8	Single strand of black-colored wire and several steel bars near surface found in single cut through mound	
Mound 58-10	Charred wood and several steel I-beams found in single cut through mound	
Mound 58-12	Disintegrated burlap sacks and coarse sand overlying a clear plastic sheet found in single cut through mound	The materials were not contaminated and were not removed
Three Mounds at north side of HALO Bunker	Minor scrap metal found in single cut through each mound	Removed and disposed of as non-regulated waste
Surface Depression 58-9	One-ft diameter metal ring and bundle of black-colored wire found in single cut through depression	

[a]Refer to Figure 4.4.2.7.1-1 for the location of each of the mounds and surface depressions.
SWMU = Solid Waste Management Unit.

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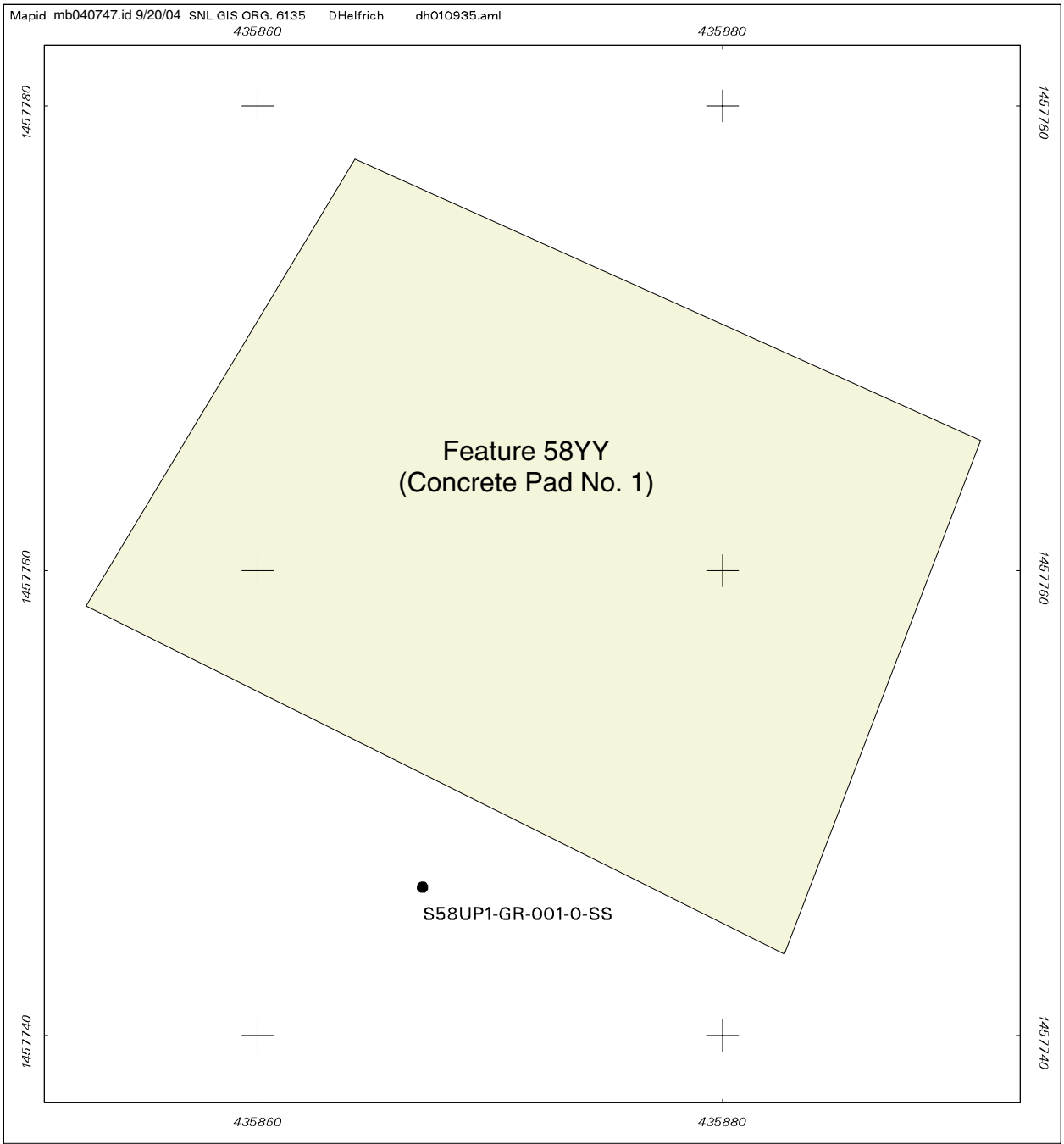

Legend

- Judgemental sample location
- Concrete Pad #1

Figure 4.4.2.7.1-2
Sample location at
Feature 58YY
(Concrete Pad No. 1)

0 3.5 7
Scale in Feet

0 0.84 1.68
Scale in Meters

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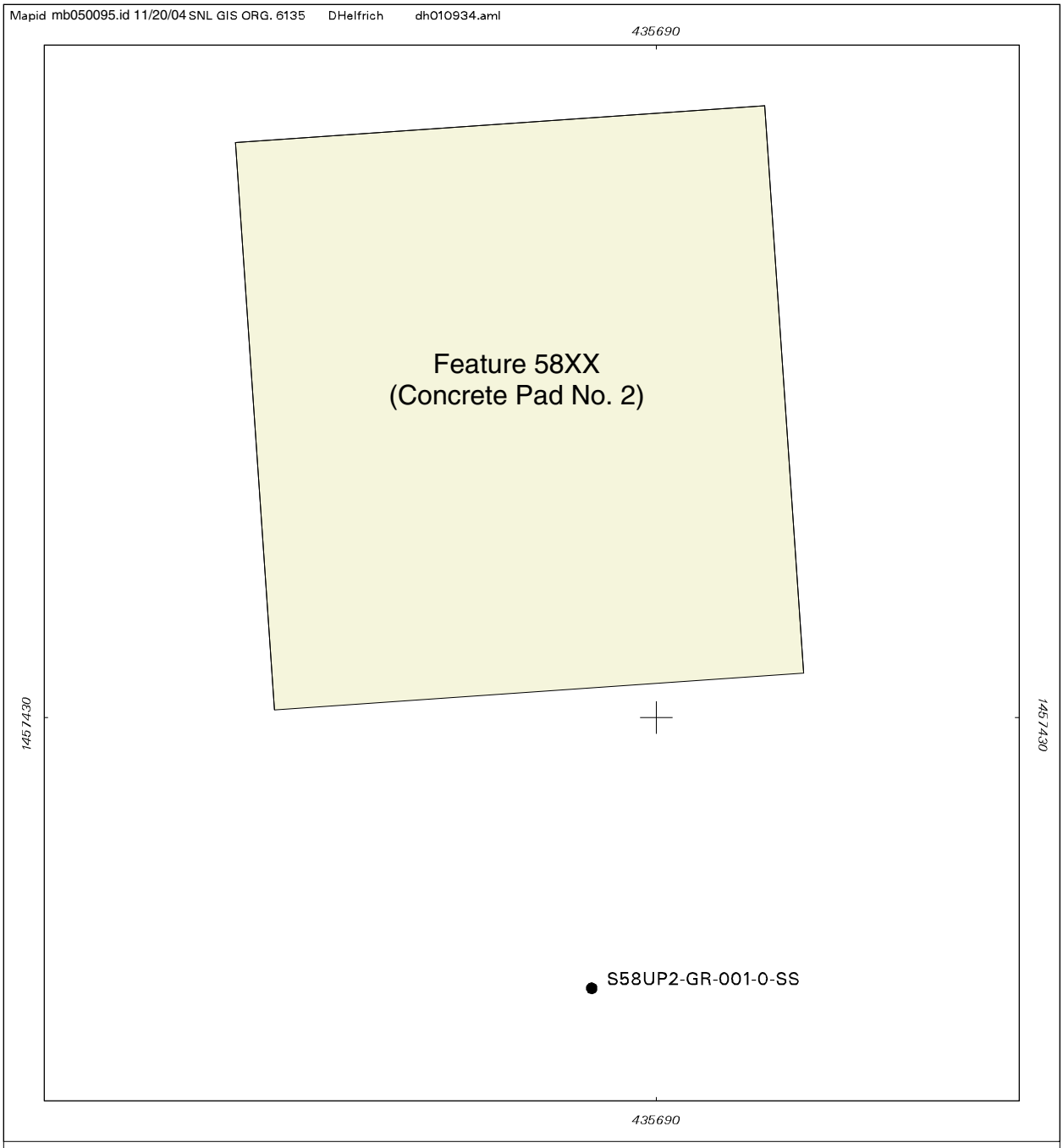

Legend

- Judgemental surface sample location
- Concrete pad No. 2

Figure 4.4.2.7.1-3
Sample location at Feature 58XX
(Concrete Pad No. 2)

0 1.5 3
Scale in Feet

0 0.36 0.72
Scale in Meters

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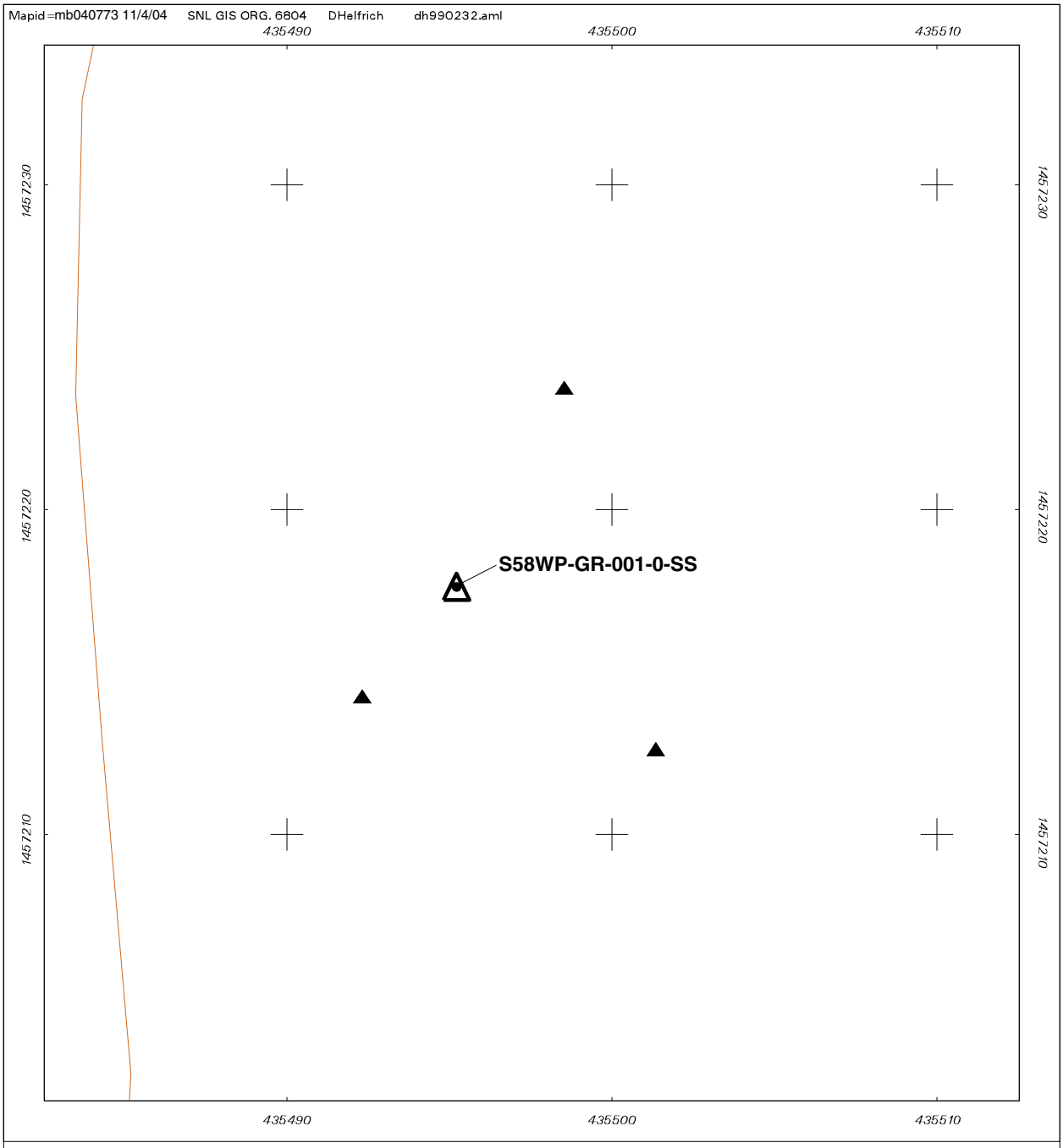

Legend

- Surface sample location
- Wooden pole location
- Metal pipe location
- 2-Foot Contour

Figure 4.4.2.7.1-4
Sample location at Feature 58WW
(Three Wooden Poles and Metal Pipe)

0 2.5 5
Scale in Feet

0 0.6 1.2
Scale in Meters

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SWMUs 58OO, 58SS, and 58ZZ (Open Boreholes)

The open boreholes were found during the RFI field investigations at SWMU 58 and were identified as SWMUs 58OO (co-located within SWMU 8), 58SS, and 58ZZ (Figure 4.4.2.7.1-5). The type and/or date of research associated with these boreholes is unknown. During RFI activities, all three boreholes were initially backfilled. Then, soil samples were collected from beneath the fill material.

SWMU 58OO (Open Borehole), located in the southern portion of SWMU 8, measured approximately 2 feet in diameter by 38 feet deep. The borehole was backfilled with soil, and soil samples were collected at 38, 43, 48, 53, 58, and 63 feet bgs using an auger/continuous core sampler. The samples were analyzed for metals, VOCs, SVOCs, and HE compounds by GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

SWMU 58SS (Open Borehole No. 1) located in the southeastern portion of SWMU 58 measured 2 feet in diameter by 6 feet deep. Prior to sampling, the borehole was backfilled with sand. Soil samples were then collected at 6, 10, and 15 feet bgs using a Geoprobe™ sampler. The samples were analyzed for metals, SVOCs, VOCs, and HE compounds at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

SWMU 58ZZ (Open Borehole No. 2), located in the north-central part of SWMU 58, measured 3 feet in diameter by 3 feet deep. This borehole was backfilled with sand, and soil samples were collected at 3, 5, and 7 feet bgs using a Geoprobe™ sampler. Because refusal was encountered at 7 feet bgs, no additional samples were collected. The samples were analyzed for metals, VOCs, SVOCs, and HE compounds at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

SWMU 58AAA (Building 9800 Drywell)

Building 9800 was used to store equipment and as a support structure to monitor testing conducted at SWMU 58. SWMU 58AAA (Building 9800 drywell) was connected to a sink in the building via a 3-inch metal pipe (Figure 4.4.2.7.1-6). The drywell was located approximately 20 feet west of the building, which has been decommissioned.

The drywell was uncovered using a backhoe and shovels. The drywell was located directly beneath the ground surface and measured 5 feet long by 3.5 feet wide by 2.5 feet high (Figure 4.4.2.7.1-7). The drywell consisted of cinder block walls, a metal lid, and a 1-foot-thick gravel base.

After consultation with NMED staff (Mignardot January 1999), one soil sample plus one duplicate were collected from beneath the gravel at the bottom of the drywell. The sample was analyzed for metals, VOCs, SVOCs, and HE compounds at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

SWMU 58CCC (Building 9805 Drainpipe)

Based upon the location and size of this structure (Quadrant A, Figure 2.1-4), Building 9805 was perhaps used for storage or to monitor testing activities in the northern part of SWMU 58

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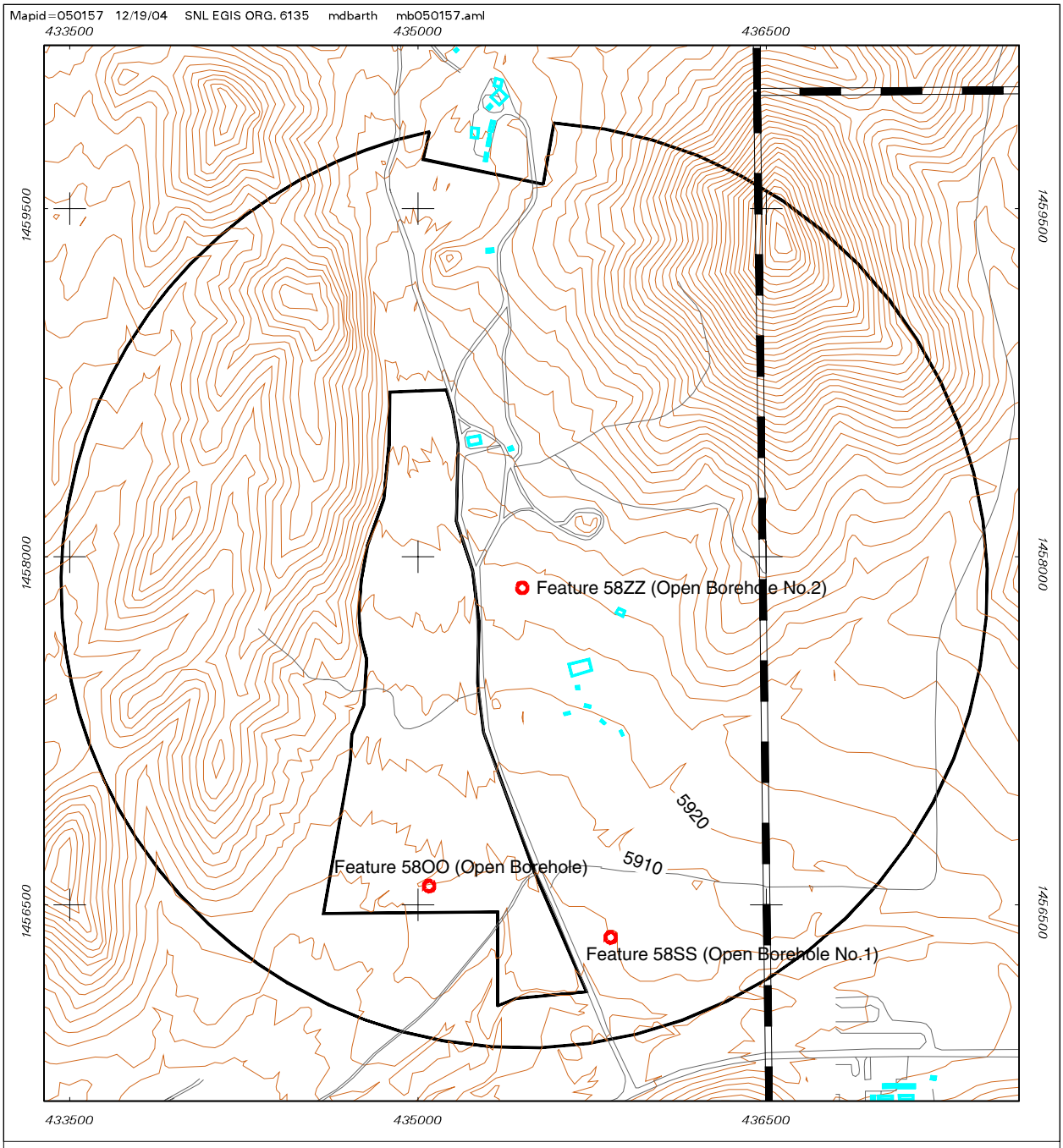

Legend

- Open Borehole Features 58ZZ, 58OO & 58SS
- Unpaved Road
- KAFB / USFS Withdrawn Area Boundary
- 10 Foot Contour
- SWMU 8 / 58 Boundary
- Building / Structure

Figure 4.4.2.7.1-5
Location of Features
58OO (Open Borehole),
58SS (Open Borehole No.1), and
58ZZ (Open Borehole No. 2)

0 350 700
Scale in Feet

0 84 168
Scale in Meters

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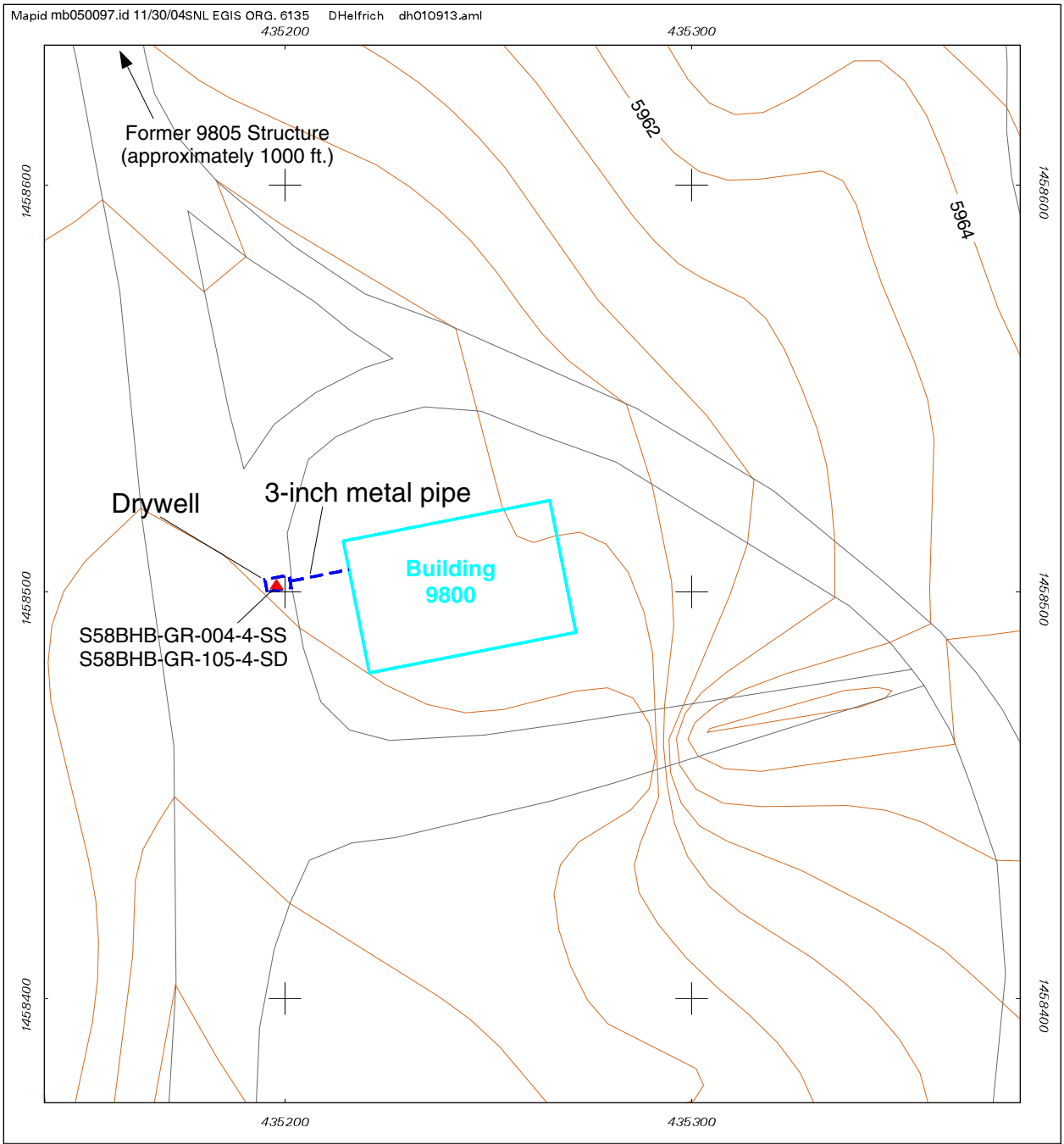

Legend

- Sample location
- 2-Foot Contour
- Unpaved Road
- Drywell and Drainline
- Building 9800

Figure 4.4.2.7.1-6
Sample locations at
Feature 58AAA
(Building 9800 Drywell)

0 20 40
Scale in Feet

0 4.8 9.6
Scale in Meters

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Figure 4.4.2.7.1-7
Photograph of drywell that serviced Building 9800, (Feature 58AAA).

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(Figure 4.4.2.7.1-8). All that remains of the structure is a concrete pad, floor drain, and drainpipe (Figure 4.4.2.7.1-9). The floor drain and drainpipe are designated as SWMU 58CCC.

The drainpipe was excavated and inspected on September 25, 1996. After consultation with NMED staff, six soil samples plus one duplicate were collected along and beneath the pipe (Byrd January 1997). The samples were analyzed for metals, VOCs, SVOCs, and HE compounds at GEL and for radionuclides by gamma spectroscopy at the SNL/NM RPSD Laboratory.

4.4.2.7.2 Sampling Results for SWMU 58—Miscellaneous Sites

Mounds and Trenches

All soil and debris removed during excavation activities at the mounds and trenches located throughout SWMU 58 were field-screened for organic vapors and radioactivity. Because no contamination was found during field-screening, no debris or surrounding soil was sampled or characterized for waste management purposes. NMED staff inspected a number of the exploratory mounds and trenches and concurred with SNL/NM's decision not to collect any samples (Mignardot January 1999).

SWMUs 58XX and 58YY (Concrete Pads Nos. 1 and 2)

Before sampling activities, SWMUs 58XX and 58YY were surveyed for radiation. No elevated radiation levels were observed. Surface soil samples labeled with prefixes S58UP1- and S58UP2- were collected. Table 4.4.2.7.2-1 summarizes the metals analytical results for the surface soil samples collected at SWMUs 58XX and 58YY. The following detections were reported:

- The two surface soil samples contained arsenic, barium, beryllium, cadmium, chromium, mercury, nickel, silver, and selenium levels below their respective background limits.

- The two surface soil samples contained elevated lead concentrations ranging from 36.1 to 3,640 mg/kg, compared to the background limit of 18.9 mg/kg.

Surface soil samples from SWMUs 58XX and 58YY also were analyzed for HE compounds. The surface sample locations were exactly the same locations where samples were collected for metal and radionuclide analyses. No HE compounds were detected in any of the soil samples collected at these features. Table 4.4.2.7.2-2 provides the HE compound MDLs for SWMUs 58XX and 58YY.

Table 4.4.2.7.2-3 summarizes the gamma spectroscopy results for the surface samples collected at SWMUs 58XX and 58YY. Neither sample had detections of uranium-235 activities but the MDAs of 0.197 and 0.203 were above the background limit of 0.16 pCi/g.

Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

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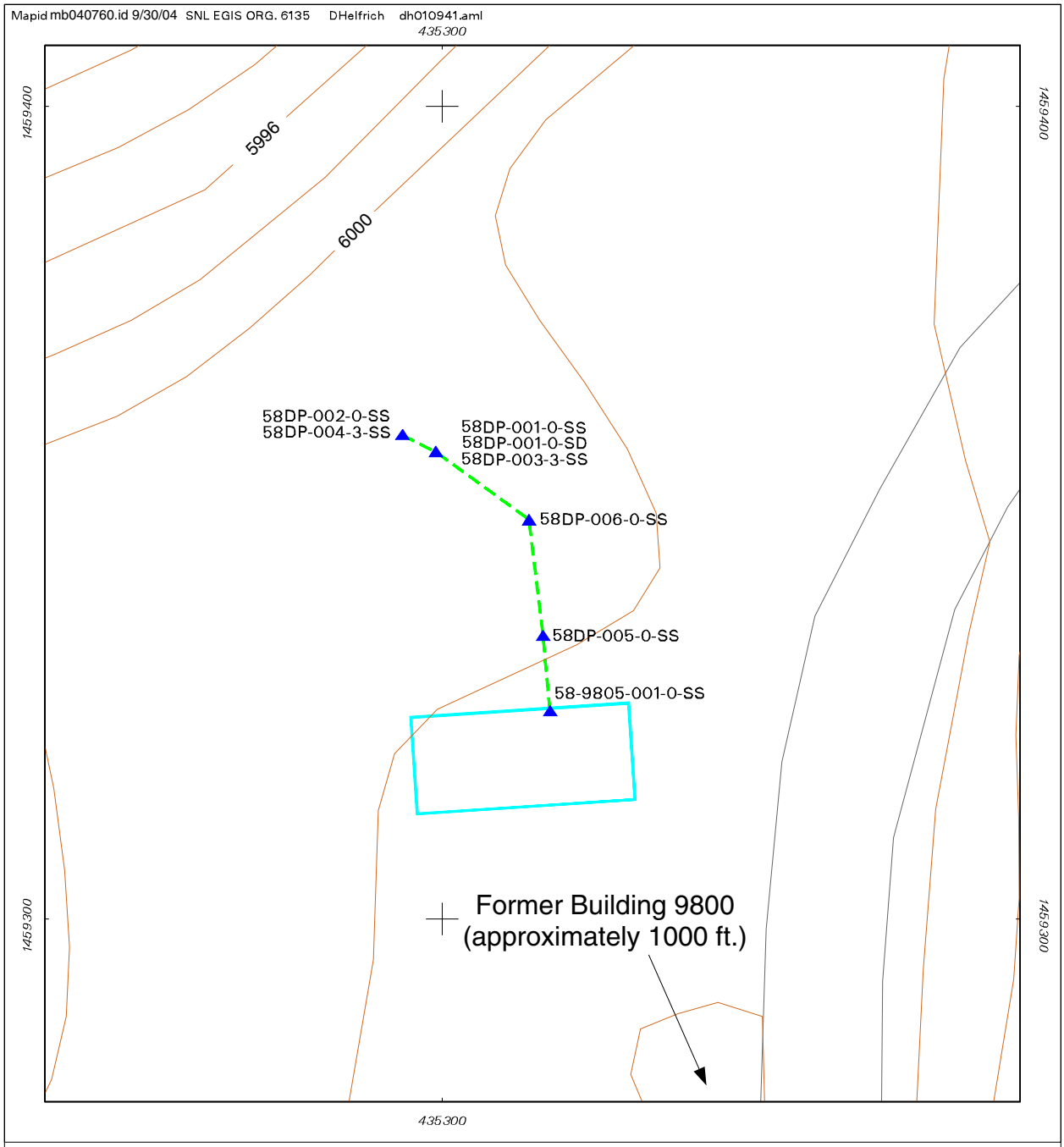

Legend

- Judgemental sample location
- Unpaved Road
- 2-Foot Contour
- Excavation Trench
- Building 9805 structure

Figure 4.4.2.7.1-8
Sample locations at
Feature 58CCC
(Building 9805 Drainpipe)

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

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Figure 4.4.2.7.1-9

Photograph of drainpipe that serviced Building 9805, Feature 58CC. The floor drain is beneath the rock. The view is to the northwest.

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Table 4.4.2.7.2-1
Summary of SWMU 58, Features 58XX, 58WW, 58YY (Miscellaneous Sites) RFI Soil Sampling, Metals Analytical Results
January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010B and 7471A[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
601310	S58UP1-GR-001-0-SS	Soil	01-18-99	0–0.5	5.25	118 J	0.403 J (0.476)	0.143 J (0.476)	6.47	12.1 J
601310	S58UP2-GR-002-0-SS	Soil	01-18-99	0–0.5	2.84	146 J	0.489	0.142 J (0.463)	7.49	na
601310	S58WP-GR-001-0-SS	Soil	01-18-99	0–0.5	3.52	117 J	0.598	0.216 J (0.481)	10.0	na
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Sample Attributes					Metals (EPA Methods 6010B and 7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Silver	Selenium
601310	S58UP1-GR-001-0-SS	Soil	01-18-99	0–0.5	**3,640**	0.0165 J	8.48	0.193 J (0.476)	ND (0.476)
601310	S58UP2-GR-002-0-SS	Soil	01-18-99	0–0.5	**36.1**	0.0228 J (0.0333)	9.05	ND (0.463)	ND (0.463)
601310	S58WP-GR-001-0-SS	Soil	01-18-99	0–0.5	12.7	0.0155 J (0.00225)	10.7	ND (0.481)	ND (0.481)
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
na = Not analyzed.
NA = Not applicable.
ND ( ) = Not detected at the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58UP1 = SWMU 58, Feature 58YY Unnamed Concrete Pad No. 1.
S58UP2 = SWMU 58, Feature 58XX Unnamed Concrete Pad No. 2.
S58WP = SWMU 58, Feature 58WW Wooden Pole.
SS = Soil Sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-2
Summary of HE Compounds Analytical MDLs for
SWMU 58, Features 58XX, 58WW, and 58YY (Miscellaneous Sites) Soil Sampling
January 1999
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
m-Dinitrobenzene	4.1
2,4-Dinitrotoluene	6.2
2,6-Dinitrotoluene	6.5
2-amino-4,6-Dinitrotoluene	6.6
4-amino-2,6-Dinitrotoluene	5.5
HMX	5.3
Nitrobenzene	5.2
m-Nitrotoluene	11
o-Nitrotoluene	7.8
p-Nitrotoluene	11
RDX	9.7
Tetryl	7.5
sym-Trinitrobenzene	6.6
2,4,6-Trinitrotoluene	5.7

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.7.2-3
Summary of SWMU 58, Features 58XX, 58WW, and 58YY (Miscellaneous Sites)
RFI Soil Sampling, Gamma Spectroscopy Analytical Results
January 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)							
					Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error	Result	Error[c]	Result	Error[c]	Result	Error[c]
601311	S58UP1-GR-001-0-SS	Soil	01-18-99	0–0.5	0.271	0.211	0.878	0.465	**ND (0.197)**	--	ND (0.536)	--
601311	S58UP2-GR-001-0-SS	Soil	01-18-99	0–0.5	0.224	0.0646	0.940	0.470	**ND (0.203)**	--	ND (0.541)	--
601311	S58WP-GR-001-0-SS	Soil	01-18-99	0–0.5	0.147	0.0515	**1.04**	0.532	0.156	0.174	ND (0.488)	--
Background Soil Activities—Lower Canyons Area[d]		Soil	NA	NA	1.55	NA	1.03	NA	0.16	NA	2.31	NA

Notes: Values in **bold** exceed background activities, or have MDAs that exceed background activities.

[a]Thorium-232 and uranium-238 decay chain isotopes with short a half-life are not presented in this table.

[b]Analysis Request/Chain-of-Custody record.

[c]Two standard deviations about the mean activity.

[d]Dinwiddie September 1997.

ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58UP1 = SWMU 58, Feature 58YY Unnamed Concrete Pad No. 1.
S58UP2 = SWMU 58, Feature 58XX Unnamed Concrete Pad No. 2.
S58WP = SWMU 58, Feature 58WW Wooden Pole.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

SWMU 58WW (Three Poles and Metal Pipe)

Initially, a cap on the metal pipe was removed and the interior inspected and surveyed for organic and radiation contamination. No contamination was observed, and no soil or other materials were observed inside the pipe. Table 4.4.2.7.2-1 summarizes the metals analytical results for the surface soil sample collected at SWMU 58WW. The sample did not contain any metal concentrations above background.

The surface sample collected from SWMU 58WW was also analyzed for HE compounds; the sample came from the same location as that for metal and radionuclide analyses. No HE compounds were detected in the soil sample collected from SWMU 58WW. Table 4.4.2.7.2-2 provides the HE compound MDLs for SWMU 58WW.

Table 4.4.2.7.2-3 summarizes the gamma spectroscopy analytical results for the surface sample collected at SWMU 58WW. The sample contained a slightly elevated thorium-232 activity of 1.04 pCi/g, compared to the background limit of 1.03 pCi/g.

Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

SWMUs 58OO, 58SS, and 58ZZ (Open Boreholes)

Table 4.4.2.7.2-4 summarizes the metals analytical results for the subsurface soil samples collected at SWMUs 58OO, 58SS, and 58ZZ. The following detections were reported:

- Five samples collected from SWMU 58OO contained elevated arsenic levels ranging from 29.7 to 137 mg/kg, compared to a background limit of 9.8 mg/kg.
- Three samples from SWMU 58OO contained elevated barium levels ranging from 257J to 313J mg/kg, compared to a background limit of 246 mg/kg.
- Five samples collected at SWMU 58OO contained elevated beryllium concentrations ranging from 1.31J to 1.99J mg/kg, compared to a background limit of 0.75 mg/kg.
- Two samples collected at SWMU 58OO contained elevated cadmium levels of 0.685J and 1.32J mg/kg, compared to a background limit of 0.64 mg/kg.
- Two samples collected at SWMU 58OO contained chromium levels of 19.5J and 45.7J mg/kg, compared to a background limit of 18.8 mg/kg.
- One sample collected at SWMU 58OO contained mercury at a concentration of 0.0579 mg/kg, slightly above the background limit of 0.055 mg/kg.
- Five samples collected at SWMU 58OO contained elevated zinc levels ranging from 71.8 to 97 mg/kg, compared to a background limit of 52.1 mg/kg.

Soil samples collected from SWMUs 58OO, 58SS, and 58ZZ were analyzed for HE compounds. Table 4.4.2.7.2-5 summarizes the HE compound analytical results for the subsurface soil samples collected at SWMU 58ZZ. With the exception of one sample from the SWMU 58ZZ

Table 4.4.2.7.2-4
Summary of SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) Soil Sampling, Metals Analytical Results
April 1997 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7470/7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium
Feature 58OO, Open Borehole									
06626	S8-GR-001-0-SS	Soil	04-24-97	0–1.0	2.5	59.8 J	0.311 J (0.485)	0.106 J (0.485)	8.53 J
06626	S8-BH-002-040-SA	Soil	04-24-97	40	2.88	56.8 J	0.658 J	0.149 J (0.485)	8.33 J
06626	S8-BH-004-050-SA	Soil	04-24-97	50	**96.9**	**257 J**	**1.66 J**	0.218 J (0.485)	**19.5 J**
06626	S8-BH-005-055-SA	Soil	04-24-97	55	**93.3**	124 J	**1.36 J**	0.160 J (0.490)	6.9 J
06626	S8-BH-007-055-DU	Soil	04-24-97	55	**29.7**	**302 J**	**1.38 J**	**0.685 J**	9.72 J
06626	S8-BH-006-060-SA	Soil	04-24-97	60	**137**	**313 J**	**1.99 J**	**1.32 J**	14.5 J
06626	S8-BH-003-065-SA	Soil	04-24-97	65	**92**	13.9 J	**1.31 J**	0.0728 J (0.485)	**45.7 J**
Feature 58SS, Open Borehole No. 1									
600347	S58BH1-GR-001-6-S	Soil	01-26-99	6.0–7.0	2.47	112	0.373 J	0.172 J	8.45
600347	S58BH1-GR-002-10-S	Soil	01-26-99	10.0–11.0	2.6	119	0.406 J	0.178 J	9.47
600347	S58BH1-GR-003-15-S	Soil	01-26-99	15.0–16.0	1.95	85.8	0.243 J	0.131 J	6.42
600347	S58BH1-GR-003-15-SD	Soil	01-26-99	15.0–16.0	2.11	77.6	0.208 J	0.130 J	5.63
Feature 58ZZ, Open Borehole No. 2									
601349	S58BH2-GR-001-3-S	Soil	01-25-99	3.0–3.5	3.61	192	0.405 J	ND (0.019)	7.85
601349	S58BH2-GR-002-5-S	Soil	01-25-99	5.0–5.5	2.06	74.5	0.226 J	ND (0.019)	5.85
601349	S58BH2-GR-003-7-S	Soil	01-25-99	7.0–7.5	2.34	74	0.203 J	ND (0.019)	6.78
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8
Quality Assurance/Quality Control Samples (mg/L)									
6583	S8-BH-009-060-EB	Water	04-24-97	NA	ND (0.00276 J)	0.000981 J (0.0100)	ND (0.000135 J)	ND (0.000209)	ND (0.000621 J)
6583	S8-BH-009-060-FB	Water	04-24-97	NA	ND (0.00276 J)	0.000325 J (0.0100)	ND (0.000135 J)	ND (0.000209)	0.000800 J (0.100)

Refer to footnotes at end of table.

Table 4.4.2.7.2-4 (Continued)
Summary of SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) Soil Sampling, Metals Analytical Results
April 1997 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
Feature 58OO, Open Borehole										
06626	S8-GR-001-0-SS	Soil	04-24-97	0–1.0	5.65 J	**0.0579**	6.2 J	0.829 J	ND (0.212 J)	0
06626	S8-BH-002-040-SA	Soil	04-24-97	40	4.49 J	0.044	6.59 J	0.779 J	ND (0.212 J)	45.9
06626	S8-BH-004-050-SA	Soil	04-24-97	50	4.62 J	0.0315 J (0.0327)	9.4 J	1.82 J	ND (0.212 J)	**97**
06626	S8-BH-005-055-SA	Soil	04-24-97	55	3.92 J	0.0375	7.5 J	1.7 J	ND (0.212 J)	**75.1**
06626	S8-BH-007-055-DU	Soil	04-24-97	55	3.27 J	0.0447	10.1 J	2.27 J	0.0893 J (0.952)	**71.8**
06626	S8-BH-006-060-SA	Soil	04-24-97	60	4.5 J	ND (0.0167)	11.8 J	0.854 J	ND (0.212 J)	**94.6**
06626	S8-BH-003-065-SA	Soil	04-24-97	65	4.64 J	ND (0.0321)	10.8 J	1.38 J	ND (0.212 J)	**93.2**
Feature 58SS, Open Borehole No. 1										
600347	S58BH1-GR-001-6-S	Soil	01-26-99	6.0–7.0	6.4	0.0134 J	8.97	0.296 J	ND (0.031)	na
600347	S58BH1-GR-002-10-S	Soil	01-26-99	10.0–11.0	6.31	ND (0.00225)	10.2	0.313 J	ND (0.031)	na
600347	S58BH1-GR-003-15-S	Soil	01-26-99	15.0–16.0	4.87	ND (0.00225)	5.7	ND (0.135)	ND (0.031)	na
600347	S58BH1-GR-003-15-SD	Soil	01-26-99	15.0–16.0	4.72	0.00335 J	5.48	ND (0.135)	ND (0.031)	na
Feature 58ZZ, Open Borehole No. 2										
601349	S58BH2-GR-001-3-S	Soil	01-25-99	3.0–3.5	5.91	0.00883 J	7.29	0.718	ND (0.031)	na
601349	S58BH2-GR-002-5-S	Soil	01-25-99	5.0–5.5	4.4	ND (0.00225)	4.41	0.723	ND (0.031)	na
601349	S58BH2-GR-003-7-S	Soil	01-25-99	7.0–7.5	3.51	ND (0.00225)	3.99	0.666	ND (0.031)	na
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)										
6583	S8-BH-009-060-EB	Water	04-24-97	NA	ND (0.00136 J)	ND (0.0001)	ND (0.000996)	ND (0.00228 J)	0.00110 J (0.0100)	ND (0.00117)
6583	S8-BH-009-060-FB	Water	04-24-97	NA	ND (0.00136 J)	ND (0.0001)	ND (0.000996)	ND (0.00228 J)	0.00194 J (0.0100)	ND (0.00117)

Refer to footnotes at end of table.

Table 4.4.2.7.2-4 (Concluded)
Summary of SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) Soil Sampling, Metals Analytical Results
April 1997 and January 1999
(Off-Site Laboratory)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
BH = Borehole.
DU = Duplicate sample.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
J = Estimated concentration.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
na = Not analyzed.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
S = Subsurface soil sample.
SA = Subsurface soil sample.
S58BH1 = SWMU 58, Open Borehole No. 1.
S58BH2 = SWMU 58, Open Borehole No. 2.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.7.2-5
Summary of SWMU 58, Feature 58ZZ (Open Borehole No. 2)
Soil Sampling, HE Analytical Results
January 1999
(Off-Site Laboratory)

Sample Attributes					HE Residues (EPA Method 8330[a]) (μg/kg)
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	HMX
601349	S58BH2GR-001-3-S	Soil	01-25-99	3.0–3.5	ND (5.3)
601349	S58BH2GR-002-5-S	Soil	01-25-99	5.0–5.5	**400 J**
601349	S58BH2GR-003-7-S	Soil	01-25-99	7.0–7.5	ND (5.3)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analytical request/chain-of-custody record.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
ND ( ) = Not detected at or above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Soil sample.
S58BH2 = SWMU 58, Open Borehole No. 2.
SWMU = Solid Waste Management Unit.

borehole, no HE compounds were detected. HMX was detected in Sample S58BH2-GR-002-5-S at a concentration of 400J μg/kg. Table 4.4.2.7.2-6 provides the HE compound MDLs for SWMUs 58OO, 58SS, and 58ZZ.

Table 4.4.2.7.2-7 provides the SVOC analytical results for the subsurface soil samples collected at SWMU 58OO. The following results were reported:

- No SVOCs were detected in subsurface samples collected at SWMUs 58SS and 58ZZ.
- Bis (2-ethylhexyl) phthalate was detected in two samples from the SWMU 58OO borehole at concentrations of 1,290 and 3,410 μg/kg.

Table 4.4.2.7.2-8 provides the SVOC MDLs for SWMUs 58OO, 58SS, and 58ZZ.

Tables 4.4.2.7.2-9 and 4.4.2.7.2-10 summarize the VOC analytical results for the subsurface soil samples collected at SWMUs 58SS and 58ZZ, respectively. The following results were reported:

- No VOCs were detected in subsurface samples collected from SWMU 58OO.
- 2-Butanone was detected in one sample from the SWMU 58SS borehole at a concentration of 75 μg/kg.
- Methylene chloride and toluene were detected in four samples from the SWMU 58SS borehole, with the maximum concentrations for methylene chloride and toluene at 5.9 and 25 μg/kg, respectively.
- Chloroform was detected in three samples from the SWMU 58ZZ borehole at a maximum concentration of 1.1 μg/kg.
- Toluene was detected in one sample from the SWMU 58ZZ borehole at a concentration of 1 μg/kg.

Table 4.4.2.7.2-11 provides the VOC MDLs for SWMUs 58OO, 58SS, and 58ZZ.

Table 4.4.2.7.2-12 summarizes the gamma spectroscopy results for the subsurface soil samples collected at SWMUs 58OO, 58SS, and 58ZZ. Six samples contained MDAs for uranium-235 ranging from 0.161 to 0.262 pCi/g, compared to the background limit of 0.16 pCi/g.

Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

SWMU 58AAA (Building 9800 Drywell)

The exterior of the drywell, as well as the gravel base, were surveyed for organic and radiation contamination; no contamination was observed. Table 4.4.2.7.2-13 summarizes the metals analytical results for the soil and duplicate samples collected at SWMU 58AAA, Building 9800 Drywell. The following detections were reported:

Table 4.4.2.7.2-6
Summary of HE Compounds Analytical MDLs for
SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) Soil Sampling
April 1997 and January 1999
(Off-Site Laboratory)

Analyte	MDL[a] (EPA Method 8330[b]) (μg/kg)
2,4-Dinitrotoluene	6.18 (6.2)
2,6-Dinitrotoluene	6.48 (6.5)
2-amino-4,6-Dinitrotoluene	6.6 (6.6)
4-amino-4,6-Dinitrotoluene	5.45 (5.45)
m-Dinitrobenzene	4.05 (4.1)
HMX	5.27 5.3)
Nitrobenzene	5.21 5.2)
m-Nitrotoluene	11.1 (11)
o-Nitrotoluene	7.83 7.8)
p-Nitrotoluene	10.6 (11)
RDX	9.71 (9.7)
Tetryl	7.55 (7.5)
sym-Trinitrobenzene	6.62 (6.6)
2,4,6-Trinitrotoluene	5.67 (5.7)

[a]1999 sample detection limits shown in parentheses.
[b]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.7.2-7
Summary of SWMU 58, Feature 58OO (Open Borehole)
Soil Sampling, SVOC Analytical Results
April 1997
(Off-Site Laboratory)

Sample Attributes					SVOC (EPA Method 8270[a]) (μg/kg)
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	bis(2-Ethylhexyl) phthalate
06626	S8BH-002-040-SA	Soil	04-24-97	40	**1,290**
06626	S8BH-004-050-SA	Soil	04-24-97	50	**3,410**
06626	S8BH-005-055-SA	Soil	04-24-97	55	ND (167)
06626	S8BH-007-055-SA	Soil	04-24-97	55	ND (167)
06626	S8BH-006-060-SA	Soil	04-24-97	60	ND (167)
06626	S8BH-003-065-SA	Soil	04-24-97	65	ND (167)
Quality Assurance/Quality Control Samples (μg/L)					
06683	S8-BH-011-060-FB	Water	04-24-97	NA	ND (5)
06683	S8-BH-011-060-EB	Water	04-27-97	NA	ND (5)

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
ID = Identification.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
MDL = Method detection limit.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
S8BH = SWMU 58, Open Borehole.
SA = Subsurface soil sample.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-8
Summary of SVOC Analytical MDLs for
SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) RFI Soil Sampling
April 1997 and January 1999
(Off-Site Laboratory)

Analyte	MDL[a] (EPA Method 8270[b]) (μg/kg)
Acenaphthene	10 (167)
Acenaphthylene	10 (167)
Anthracene	10 (167)
Benzo(a)anthracene	10 (167)
Benzo(a)pyrene	10 (167)
Benzo(b)fluoranthene	10 (167)
Benzo(g,h,I)perylene	10 (167)
Benzo(k)fluoranthene	10 (167)
Benzoic acid	50 (333)
Benzyl alcohol	10 (167)
4-Bromophenyl-phenylether	10 (167)
Butylbenzylphthalate	10 (167)
4-Chloro-3-methylphenol	10 (167)
4-Chloroaniline	20 (167)
bis(2-Chloroethoxy) methane	10 (167)
bis(2-Chloroethyl) ether	10 (167)
bis(2-Chloroisopropyl) ether	10 (167)
2-Chloronaphthalene	10 (167)
2-Chlorophenol	10 (167)
4-Chlorophenyl-phenylether	10 (167)
Chrysene	10 (167)
m,p-Cresol	10 (167)
o-Cresol	10 (167)
Dibenzo(a,h)anthracene	10 (167)
Dibenzofuran	10 (167)
1,2-Dichlorobenzene	10 (167)
1,3-Dichlorobenzene	10 (167)
1,4-Dichlorobenzene	10 (167)
3,3-Dichlorobenzidine	20 (833)
2,4-Dichlorophenol	10 (167)
Diethylphthalate	10 (167)
2,4-Dimethylphenol	10 (167)
Dimethylphthalate	10 (167)
Di-n-butyl phthalate	10 (167)
4,6-Dinitro-2-methylphenol	10 (167)
2,4-Dinitrophenol	20 (333)
2,4-Dinitrotoluene	10 (167)
2,6-Dinitrotoluene	10 (167)
Di-n-octylphthalate	10 (167)
1,2-Diphenylhydrazine	10 (167)
bis(2-Ethylhexyl) phthalate	10 (167)
Fluoranthene	10 (167)
Fluorene	10 (167)

Refer to footnotes at end of table.

Table 4.4.2.7.2-8 (Concluded)
Summary of SVOC Analytical MDLs for
SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes) RFI Soil Sampling
April 1997 and January 1999
(Off-Site Laboratory)

Analyte	MDL[a] (EPA Method 8270[b]) (μg/kg)
Hexachlorobenzene	10 (167)
Hexachlorobutadiene	10 (167)
Hexachlorocyclopentadiene	10 (167)
Hexachloroethane	10 (167)
Indeno (1,2,3-cd) pyrene	10 (167)
Isophorone	10 (167)
2-Methylnaphthalene	10 (167)
Naphthalene	10 (167)
m-Nitroaniline	10 (167)
o-Nitroaniline	10 (167)
p-Nitroaniline	10 (167)
Nitrobenzene	10 (167)
2-Nitrophenol	10 (167)
4-Nitrophenol	10 (167)
n-Nitroso-di-n-propylamine	10 (167)
n-Nitrosodiphenylamine	10 (167)
Pentachlorophenol	20 (167)
Phenanthrene	10 (167)
Phenol	10 (167)
Pyrene	10 (167)
1,2,4-Trichlorobenzene	10 (167)
2,4,5-Trichlorophenol	10 (167)
2,4,6-Trichlorophenol	10 (167)

[a]1997 sampling detection limits shown in parentheses.
[b]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-9
Summary of SWMU 58, Feature 58SS (Open Borehole No. 1) Soil Sampling, VOC Analytical Results
January 1999
(Off-Site Laboratory)

Sample Attributes					VOC (EPA Method 8240[a]) (μg/kg)		
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	2-Butanone	Methylene Chloride	Toluene
600347	S58BH1-GR-001-6-S	soil	01-26-99	6.0–7.0	ND (2.1)	**5.2**	**13**
600347	S58BH1-GR-002-10-S	soil	01-26-99	10.0–11.0	ND (2.1)	**5.9**	**8.1**
600347	S58BH1-GR-003-15-S	soil	01-26-99	15.0–16.0	**75**	**5.8**	**25**
600347	S58BH1-GR-103-0-SD[c]	soil	01-26-99	0–1.0	ND (2.1)	**5.3**	**2.7**
Quality Assurance/Quality Control Samples (μg/L)							
601351	S58-GR-113-EB	Water	01-26-99	NA	ND (5.9)	**1.6 JB (1.2)**	ND (0.5)
601351	S58-GR-114-FB	Water	01-26-99	NA	ND (5.9)	**3.1 JB (1.2)**	ND (0.5)
601351	S58-GR-115-TB	Water	01-26-99	NA	ND (5.9)	ND (1.2)	ND (0.5)

Note: Values in **bold** represent detected concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample S58BH1-GR-103-0-SD is a duplicate of S58BH1-GR-003-15-S.

B = Analyte present in associated blank.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Subsurface soil sample.
S58BH1 = SWMU 58, Open Borehole No. 1.
SD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 4.4.2.7.2-10
Summary of SWMU 58, Feature 58ZZ (Open Borehole No. 2) Soil Sampling, VOC Analytical Results
January 1999
(Off-Site Laboratory)

Sample Attributes					VOC (EPA Method 8240[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chloroform	Toluene
601349	S58BH2GR-001-3-S	Soil	01-25-99	3.0–3.5	**1.1**	ND (0.22)
601349	S58BH2GR-002-5-S	Soil	01-25-99	5.0–5.5	**0.89 J**	**1**
601349	S58BH2GR-003-7-S	Soil	01-25-99	7.0–7.5	**0.92 J**	ND (0.22)
Quality Assurance Samples (μg/L)						
601308	S58-GR-110-EB	Water	01-25-99	NA	ND (0.7)	ND (0.5)
601308	S58-GR-111-FB	Water	01-25-99	NA	ND (0.7)	ND (0.5)
601308	S58-GR-112-TB	Water	01-25-99	NA	ND (0.7)	ND (0.5)

Note: Values in **bold** represent detected concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Subsurface soil sample.
S58BH2 = SWMU 58, Open Borehole No. 2.
SWMU = Solid Waste Management Unit.
TB = Trip blank.
VOC = Volatile organic compound.

Table 4.4.2.7.2-11
Summary of VOC Analytical MDLs for SWMU 58, Features 58OO, 58SS, and 58ZZ
(Open Boreholes) RFI Soil Sampling
April 1997 and January 1999
(Off-Site Laboratory)

Analyte	MDL[a] (EPA Method 8240[b]) (μg/kg)
Acetone	2 (2.2)
Benzene	1 (0.25)
Bromodichloromethane	1 (0.24)
Bromoform	1 (0.27)
Bromomethane	1 (0.21)
Butanone2-	2 (2.1)
Carbon Disulfide	2 (2.2)
Carbon Tetrachloride	1 (0.22)
Chlorobenzene	1 (0.25)
Chloroethane	1 (0.24)
Chloroform	1 (0.24)
Chloromethane	1 (0.21)
Dibromochloromethane	1 (0.24)
1,1-Dichloroethane	1 (0.2)
1,2-Dichloroethane	1 (0.23)
cis-1,2-Dichloroethene	1 (0.25)
trans-1,2-Dichloroethene	1 (0.19)
1,1-Dichloroethene	1 (0.2)
1,2-Dichloropropane	1 (0.23)
cis-1,3-Dichloropropene	1 (0.25)
trans-1,3-Dichloropropene	1 (0.22)
Ethylbenzene	1 (0.23)
2-Hexanone	2 (4.4)
4-Methyl-2-pentanone	2 (2.9)
Methylene Chloride	1 (0.25)
Styrene	1 (0.22)
1,1,2,2-Tetrachloroethane	1 (0.46)
Tetrachloroethene	1 (0.23)
Toluene	1 (0.22)
1,1,1-Trichloroethane	1 (0.18)
1,1,2-Trichloroethane	1 (0.18)
Trichloroethene	1 (0.27)
Vinyl Acetate	2 (1.8)
Vinyl Chloride	1 (0.4)
Xylene (Total)	2 (0.62)

[a]1999 sampling detection limits shown in parentheses.
[b]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit
VOC = Volatile organic compound.

Table 4.4.2.7.2-12
Summary of SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes)
RFI Soil Sampling, Gamma Spectroscopy Analytical Results
April 1997 and January 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error	Result	Error[c]
Feature 58OO, Open Borehole								
06628	S8-GR-001-0-SS	Soil	04-24-97	0–1.0	0.783	0.214	0.802	0.365
06628	S8-GR-002-040-SA	Soil	04-24-97	40	ND (0.0337)	--	ND (0.131)	--
Feature 58SS, Open Borehole No. 1								
601348	S58BH1GR-001-6-S	Soil	01-26-99	6.0–6.5	ND (0.0240)	--	0.575	0.324
601348	S58BH1GR-002-10-S	Soil	01-26-99	10.0–10.5	0.0244	0.0247	0.667	0.342
601348	S58BH1GR-003-15-S	Soil	01-26-99	15.0–15.5	ND (0.0228)	--	0.514	0.289
601348	S58BH1GR-103-0-SD[d]	Soil	01-26-99	0–6.5	ND (0.0284)	--	0.512	0.286
Feature 58ZZ, Open Borehole No. 2								
601350	S58BH2GR-001-3-S	Soil	01-25-99	3.0–3.5	ND (0.0176)	--	0.762	0.385
601350	S58BH2GR-002-5-S	Soil	01-25-99	5.0–5.5	ND (0.0245)	--	0.498	0.292
601350	S58BH2GR-003-7-S	Soil	01-25-99	7.0–7.5	ND (0.0245)	--	0.650	0.357
Background Activities—Lower Canyons Area[e]		NA	NA	NA	1.55	NA	1.03	NA

Refer to footnotes at end of table.

Table 4.4.2.7.2-12 (Concluded)
Summary of SWMU 58, Features 58OO, 58SS, and 58ZZ (Open Boreholes)
RFI Soil Sampling, Gamma Spectroscopy Analytical Results
April 1997 and January 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error
Feature 58OO, Open Borehole								
06628	S8-GR-001-0-SS	Soil	04-24-97	0–1.0	**ND (0.262)**	--	ND (1.87)	--
06628	S8-GR-002-040-SA	Soil	04-24-97	40	**ND (0.198)**	--	ND (1.40)	--
Feature 58SS, Open Borehole No. 1								
601348	S58BH1GR-001-6-S	Soil	01-26-99	6.0–6.5	**ND (0.177)**	--	ND (0.608)	--
601348	S58BH1GR-002-10-S	Soil	01-26-99	10.0–10.5	0.0943	0.147	ND (0.619)	--
601348	S58BH1GR-003-15-S	Soil	01-26-99	15.0–15.5	0.0950	0.131	ND (0.566)	--
601348	S58BH1GR-103-0-SD[c]	Soil	01-26-99	0–6.5	**ND (0.161)**	--	ND (0.442)	--
Feature 58ZZ, Open Borehole No. 2								
601350	S58BH2GR-001-3-S	Soil	01-25-99	3.0–3.5	0.0896	0.146	ND (0.635)	--
601350	S58BH2GR-002-5-S	Soil	01-25-99	5.0–5.5	**ND (0.176)**	--	ND (0.585)	--
601350	S58BH2GR-003-7-S	Soil	01-25-99	7.0–7.5	**ND (0.180)**	--	ND (0.614)	--
Background Activities—Lower Canyons Area[e]		NA	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviation about the MDA.
[e]Dinwiddie September 1997.

ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Subsurface soil sample.
S58BH1 = SWMU 58, Open Borehole No. 1.
S58BH2 = SWMU 58, Open Borehole No. 2.
SA = Subsurface soil sample.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.7.2-13
Summary of SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling, Metals Analytical Results
January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010B and 7470/7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium
601333	S58BHB-GR-00-0-S	Soil	01-20-99	0–1.0	3.96	78.2	0.670	**6.02**	10.9
601333	S58BHB-GR-105-0-SD	Soil	01-20-99	0–1.0	2.39	138	0.456	**5.95**	9.32
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8

Sample Attributes					Metals (EPA Methods 6010B and 7470/7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Silver	Selenium
601333	S58BHB-GR-00-0-S	Soil	01-20-99	0–1.0	**37.2**	**0.257**	13.3	**36.7**	0.269 J (0.463)
601333	S58BHB-GR-105-0-SD	Soil	01-20-99	0–1.0	**29.6**	**0.256**	12.1	**60.5**	0.256 J (0.455)
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	18.9	0.055	16.6	<0.50	2.7

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Garcia November 1998.

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58BUB = SWMU 58, Building 9800 Drywell (Feature 58AAA).
SD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

- One sample and one sample duplicate contained elevated cadmium at levels of 5.95 to 6.02 mg/kg, which were above the background limit of 0.64 mg/kg.
- One sample and one sample duplicate contained elevated lead at concentrations of 37.2 and 29.6 mg/kg, respectively, which were above the background limit of 18.9 mg/kg.
- One sample and one sample duplicate contained elevated mercury at concentrations of 0.256 and 0.257 mg/kg, respectively, compared to the background limit of 0.055 mg/kg.
- One sample and one sample duplicate contained silver at concentrations of 36.7 and 60.5 mg/kg, compared to the background limit of less than 0.50 mg/kg.

The drywell soil sample and duplicate collected from SWMU 58AAA were analyzed for HE compounds. Table 4.4.2.7.2-14 summarizes the HE compound analytical results for the soil sample collected at SWMU 58AAA. Explosives 2,4,6-trinitrotoluene and 2,4-dinitrotoluene were detected in the one sample at 320J and 130J μg/kg, respectively, but these compounds were not detected in the associated sample duplicate. No other HE compounds were detected. Table 4.4.2.7.2-15 provides the HE compound MDLs for SWMU 58AAA.

Table 4.4.2.7.2-16 summarizes the SVOC analytical results for the soil sample and duplicate sample collected at SWMU 58AAA. The sample duplicate (S58BHB-GR-105-0-SD) had an elevated concentration of pentachlorophenol at 2,700 μg/kg, but no SVOCs were detected in the associated soil sample. Table 4.4.2.7.2-17 provides the analytical MDLs for the SVOCs investigated at SWMU 58AAA.

Methylene chloride was detected in the one sample and sample duplicate at SWMU 58AAA, at a maximum concentration of 13 μg/kg. Methylene chloride was also detected in the associated EB and TB samples; therefore, the sample results were qualified as nondetects. Table 4.4.2.7.2-18 summarizes the VOC MDLs for SWMU 58AAA.

Table 4.4.2.7.2-19 summarizes the gamma spectroscopy results for the soil samples collected at SWMU 58AAA. All cesium-137, thorium-232, uranium-235, and uranium-238 activity levels were below the corresponding background activity or the MDA. The MDA for uranium-235 had values of 0.203 and 0.212 pCi/g, which are both slightly above the background activity. Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

SWMU 58CCC (Building 9805 Drainpipe)

Table 4.4.2.7.2-20 summarizes the metals analytical results for the soil samples collected at the SWMU 58CCC Building 9805 Drainpipe. The following detections were reported:

- Four samples contained elevated barium concentrations ranging from 249 to 453 mg/kg, compared to a background limit of 246 mg/kg.
- One sample contained cadmium at a concentration of 0.813J mg/kg, compared to a background limit of 0.64 mg/kg.
- Two samples contained copper at concentrations of 19.9 mg/kg and 21.8 mg/kg, compared to a background limit of 17.1 mg/kg.

Table 4.4.2.7.2-14
Summary of SWMU 58, Feature 58AAA (Building 9800 Drywell)
RFI Soil Sampling, HE Analytical Results
January 1999
(Off-Site Laboratory)

Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	HE Residues (EPA Method 8330[a]) (μg/kg)	
					2,4-Dinitrotoluene	2,4,6-Trinitrotoluene
601333	S58BHB-GR-00-0-S	Soil	01-20-99	0–0.5	**130 J**	**320 J**
601333	S58BHB-GR-105-0-SD	Soil	01-20-99	0–0.5	ND (6.2)	ND (5.7)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
ND ( ) = Not detected at or above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Soil sample.
S58BHB = SWMU 58, Building 9800 Drywell.
SD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-15
Summary of HE Compound Analytical MDLs for
SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling
January 1999
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
m-Dinitrobenzene	4.1
2,4-Dinitrotoluene	6.2
2,6-Dinitrotoluene	6.5
2-amino-4,6-Dinitrotoluene	6.6
4-amino-2,6-Dinitrotoluene	5.5
HMX	5.3
Nitrobenzene	5.2
m-Nitrotoluene	11
o-Nitrotoluene	7.8
p-Nitrotoluene	11
RDX	9.7
Tetryl	7.5
sym-Trinitrobenzene	6.6
2,4,6-Trinitrotoluene	5.7

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.7.2-16
Summary of SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling
SVOC Analytical Results
January 1999
(Off-Site Laboratory)

Sample Attributes					SVOCs (EPA Method 8270[a]) (μg/kg)
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Pentachlorophenol
601333	S58BHB-GR-00-0-S	Soil	01-20-99	0–0.5	ND (20)
601333	S58BHB-GR-105-0-SD	Soil	01-20-99	0–0.5	**2,700 J**
Quality Assurance/Quality Control samples (μg/L)					
601333	S58-GR-103-EB	Water	01-20-99	NA	ND (2.8)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected at or above the MDL in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Soil sample.
SD = Soil sample duplicate.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-17
Summary of SVOC Analytical MDLs for
SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling
January 1999
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (μg/kg)
Acenaphthene	10
Acenaphthylene	10
Anthracene	10
Benzo(a)anthracene	10
Benzo(a)pyrene	10
Benzo(b)fluoranthene	10
Benzo(g,h,I)perylene	10
Benzo(k)fluoranthene	10
Benzoic acid	50
Benzyl alcohol	10
4-Bromophenyl-phenyl ether	10
Butyl benzyl phthalate	10
Carbazole	10
4-Chloro-3-methyl phenol	10
4-Chloroaniline	20
bis(2-Chloroethoxy) methane	10
bis(2-Chloroethyl) ether	10
bis(2-Chloroisopropyl) ether	10
2-Chloronaphthalene	10
2-Chlorophenol	10
4-Chlorophenyl-phenyl ether	10
Chrysene	10
m,p-Cresol	10
o-Cresol	10
Dibenzo(a,h)anthracene	10
Dibenzofuran	10
1,2-Dichlorobenzene	10
1,3-Dichlorobenzene	10
1,4-Dichlorobenzene	10
3,3-Dichlorobenzidine	20
2,4-Dichlorophenol	10
Diethyl phthalate	10
Dimethyl phthalate	10
2,4-Dimethylphenol	10
Di-n-butyl phthalate	10
2,4-Dinitrophenol	20
2-methyl-4,6-Dinitrophenol	10
2,4-Dinitrotoluene	10
2,6-Dinitrotoluene	10
Di-n-octyl phthalate	10
1,2-Diphenylhydrazine	10
bis(2-Ethylhexyl) phthalate	10
Fluoranthene	10

Refer to footnotes at end of table.

Table 4.4.2.7.2-17 (Concluded)
Summary of SVOC Analytical MDLs for
SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling
January 1999
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (μg/kg)
Fluorene	10
Hexachlorobenzene	10
Hexachlorobutadiene	10
Hexachlorocyclopentadiene	10
Hexachloroethane	10
Indeno (1,2,3-cd) pyrene	10
Isophorone	10
2-Methylnaphthalene	10
Naphthalene	10
m-Nitroaniline	10
o-Nitroaniline	10
p-Nitroaniline	10
Nitrobenzene	10
2-Nitrophenol	10
4-Nitrophenol	10
n-Nitrosodiphenylamine	10
n-Nitrosodipropylamine	10
Pentachlorophenol	20
Phenanthrene	10
Phenol	10
Pyrene	10
1,2,4-Trichlorobenzene	10
2,4,5-Trichlorophenol	10
2,4,6-Trichlorophenol	10

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SVOC = Semivolatile Organic Compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-18
Summary of VOC Analytical MDLs for
SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling
January 1999
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8260[a]) (μg/kg)
Acetone	1.00
Benzene	1.00
Bromoform	1.00 J
2-Butanone	5.00
Carbon Disulfide	5.00
Carbon Tetrachloride	1.00
Chlorobenzene	1.00
Chlorodibromomethane	1.00
Chloroethane	1.00
Chloroform	1.00
Dichlorobromomethane	1.00
1,1-Dichloroethane	1.00
1,2-Dichloroethane	1.00
cis-1,2-Dichloroethylene	1.00
1,1-Dichloroethylene	1.00
1,2-trans-Dichloroethylene	1.00
1,2-Dichloropropane	1.00
cis-1,3-Dichloropropylene	1.00
trans-1,3-Dichloropropylene	1.00
Ethylbenzene	1.00
2-Hexanone	5.00
Methyl Bromide	1.00
Methyl Chloride	5.00
4-Methyl-2-pentanone	5.00
Methylene Chloride	1.00
Styrene	1.00
1,1,2,2-Tetrachloroethane	1.00
Tetrachloroethylene	1.00
Toluene	1.00
1,1,1-Trichloroethane	1.00
1,1,2-Trichloroethane	1.00
Trichloroethylene	1.00
Vinyl Acetate	5.00
Vinyl Chloride	1.00
Xylenes (Total)	2.00

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
VOC = Volatile Organic Compound.

Table 4.4.2.7.2-19
Summary of SWMU 58, Feature 58AAA (Building 9800 Drywell) RFI Soil Sampling
Gamma Spectroscopy Analytical Results
January 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)							
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
					Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
601312	S58BHB-GR-004-4-SS	Soil	01-20-99	4.0–4.5	0.0754	0.0392	0.882	0.434	**ND (0.203)**	--	ND (0.707)	--
601312	S58BHB-GR-105-4-SD	Soil	01-20-99	4.0–4.5	0.0529	0.0312	0.792	0.421	**ND (0.212)**	--	ND (0.731)	--
Background Activities—Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.

[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.

[b]Analysis request/chain-of-custody record.

[c]Two standard deviations about the MDA.

[d]Dinwiddie September 1997.

ER = Environmental Restoration.
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S58BHB = SWMU 58 Building 9800 Drywell (Feature 58AAA).
SD = Soil sample duplicate.
SS = Soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.4.2.7.2-20
Summary of SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling, Metals Analytical Results
September 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7470/7471[a]) (mg/kg)						
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Mercury
5822	58DP-001-0-SS	Soil	09-24-96	0–0.5	3.94	150	0.326 J (0.467)	0.232 J (0.467)	5.43 J	**21.8**	ND (0.02)
5822	58DP-001-0-SD	Soil	09-24-96	0–0.5	3.13	139	0.258 J (0.463)	0.178 J (0.463)	3.57 J	**19.9**	ND (0.02)
5822	58DP-002-0-SS	Soil	09-24-96	0–0.5	3.46	158	0.297 J (0.485)	0.117 J (0.485)	4.44 J	9.23	ND (0.02)
5822	58DP-003-3-SS	Soil	09-24-96	3.0–3.5	5.39	**265**	0.301 J (0.485)	0.0582 J (0.485)	10.9 J	9.96	ND (0.02)
5822	58DP-004-3-SS	Soil	09-24-96	3.0–3.5	5.33	**453**	0.322 J (0.485)	**0.813 J (0.485)**	10 J	10.2	ND (0.02)
5822	58DP-005-0-SS	Soil	09-24-96	0–0.5	3.72	**249**	0.331 J (0.485)	0.132 J (0.485)	5.95 J	9.91	ND (0.02)
5822	58DP-006-0-SS	Soil	09-24-96	0–0.5	3.82	**270**	0.320 J (0.459)	0.149 J (0.459)	6.10 J	13.2	ND (0.02)
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8 J	17.1	0.055
Quality Assurance Samples (mg/L)											
5822	58DP-006-0-EB	NA	09-24-96	NA	ND (0.00186)	0.000649 J (0.0100)	0.000456 J (0.00500)	0.000727 J (0.00500)	0.000917 J (0.0100)	0.000142 J (0.0100)	ND (0.000200)
5822	58DP-006-0-FB	NA	09-24-96	NA	ND (0.00186)	0.000541 J (0.0100)	0.000251 J (0.00500)	0.000606 J (0.00500)	0.00105 J (0.0100)	0.000142 J (0.0100)	ND (0.000200)

Refer to footnotes at end of table.

Table 4.4.2.7.2-20 (Concluded)
Summary of SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling, Metals Analytical Results
September 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010A and 7470/7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Nickel	Lead	Selenium	Silver	Zinc
5822	58DP-001-0-SS	Soil	09-24-96	0–0.5	7.88	11.3	ND (0.114)	0.0454 J (0.935)	18.9
5822	58DP-001-0-SD	Soil	09-24-96	0–0.5	6.58	10.2	ND (0.114)	0.0576 J (0.926)	12.8
5822	58DP-002-0-SS	Soil	09-24-96	0–0.5	6.9	5.72	ND (0.114)	ND (0.0212)	15
5822	58DP-003-3-SS	Soil	09-24-96	3.0–3.5	12.2	4.62	ND (0.114)	ND (0.0212)	33.2
5822	58DP-004-3-SS	Soil	09-24-96	3.0–3.5	15.1	5.99	ND (0.114)	ND (0.0212)	34.2
5822	58DP-005-0-SS	Soil	09-24-96	0–0.5	7.95	7.96	ND (0.114)	0.0536 J (0.971)	18.2
5822	58DP-006-0-SS	Soil	09-24-96	0–0.5	7.55	17.2	ND (0.114)	ND (0.0212)	19.7
NMED-Approved Background Values—Canyons Area[c]		Soil	NA	NA	16.6	18.9	2.7	<0.50	52.1
Quality Assurance Samples (mg/L)									
5822	58DP-006-0-EB	NA	09-24-96	NA	0.00104 J (0.0100)	0.00333	0.00148 J (0.00500)	ND (0.00249)	0.00401 J (0.0200)
5822	58DP-006-0-FB	NA	09-24-96	NA	0.000916 J (0.0100)	0.003	ND (0.00143)	ND (0.00249)	0.0027 J (0.0200)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

58DP = SWMU 58, Building 9805 Drainpipe (Feature 58CCC).
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

No HE compounds were detected in any of the soil samples collected from the SWMU 58CCC drainpipe. Table 4.4.2.7.2-21 provides the HE compound MDLs for SWMU 58CCC.

No SVOCs were detected in any of the soil samples collected from the SWMU 58CCC drainpipe. Table 4.4.2.7.2-22 provides the SVOC MDLs for SWMU 58CCC.

Except for acetone and 2-butanone, no VOCs were detected in soil samples collected from the SWMU 58CCC drainpipe. Acetone and 2-butanone were also detected in the associated TB sample; therefore, both VOCs were qualified as nondetections. Table 4.4.2.7.2-23 summarizes the VOC MDLs for SWMU 58CCC.

Table 4.4.2.7.2-24 summarizes the gamma spectroscopy results for the soil samples collected from the SWMU 58CCC drainpipe. The following results were reported:

- Two samples contained thorium at activity levels of 1.07 and 1.1 pCi/g, slightly above the background limit of 1.03 pCi/g.
- Five samples had MDAs of 0.192 to 0.224 pCi/g for the uranium-235 analyses, which are above the background limit of 0.16 pCi/g.
- Six samples had MDAs of 2.68 to 3.24 pCi/g for the uranium-238 analyses, which are above the background limit of 2.31 pCi/g.

Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

4.4.2.7.2.1 Data Quality Results for SWMU 58—Miscellaneous Sites

This section discusses the results of analyses of the QA/QC samples that were collected as part of the RFI soil sampling at the SWMU 58 Miscellaneous Sites, including 1) mounds and trenches located throughout the site; 2) SWMUs 58XX and 58YY (Concrete Pads Nos. 2 and 1, respectively); 3) SWMU 58WW (Three Poles and Metal Pipe); 4) SWMUs 58OO, 58SS, and 58ZZ (Open Boreholes); 5) SWMU 58AAA (Building 9800 Drywell); and 6) SWMU 58CCC (Building 9805 Drainpipe). The QA/QC samples were collected as part of the sampling events conducted from 1996 to 1999 and included four duplicate, six EB, five FB, and two TB samples.

The EB samples were analyzed off site for metals, VOCs, SVOCs, and HE compounds. Metal concentrations were slightly greater than the MDLs for barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, and zinc. The concentrations of barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, and zinc were below the PQL, and the results were qualified as J (estimated). No SVOCs or HE compounds were detected in the EB samples. Acetone, 2-butanone, and methylene chloride were detected in one EB sample. No QA/QC samples were collected for radionuclide analyses.

The FB samples were analyzed off site for metals, VOCs, SVOCs, and HE compounds. Metal concentrations were slightly greater than the MDLs for barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, and zinc. The concentrations of barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, and zinc were below the PQL, and the results were qualified as J (estimated). No SVOCs or HE compounds were detected in the FB samples. Acetone, 2-butanone, and methylene chloride were detected in one FB sample. No QA/QC samples were collected for radionuclide analyses.

Table 4.4.2.7.2-21
Summary of HE Compounds Analytical MDLs for
SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling
September 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8330[a]) (μg/kg)
2,4-Dinitrotoluene	6.18
2,6-Dinitrotoluene	6.48
2-amino-4,6-Dinitrotoluene	6.6
4-amino-4,6-Dinitrotoluene	5.45
m-Dinitrobenzene	4.05
Nitrobenzene	5.21
m-Nitrotoluene	11.1
o-Nitrotoluene	7.83
p-Nitrotoluene	10.6
RDX	9.71
Tetryl	7.55
sym-Trinitrobenzene	6.62

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
Tetryl = Trinitro-2,4,6-phenylmethylnitramine.

Table 4.4.2.7.2-22
Summary of SVOC Analytical MDLs for
SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling
September 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (μg/kg)
Acenaphthene	167
Acenaphthylene	167
Anthracene	167
Benzo(a)anthracene	167
Benzo(a)pyrene	167
Benzo(b)fluoranthene	167
Benzo(g,h,I)perylene	167
Benzo(k)fluoranthene	167
Benzoic acid	333
Benzyl alcohol	167
4-Bromophenyl-phenylether	167
Butylbenzylphthalate	167
4-Chloro-3-methylphenol	167
4-Chloroanaline	167
bis(2-Chloroethoxy) methane	167
bis(2-Chloroethyl) ether	167
bis(2-Chloroisopropyl) ether	167
2-Chloronaphthalene	167
2-Chlorophenol	167
4-Chlorophenyl-phenylether	167
Chrysene	167
Dibenzo(a,h)anthracene	167
Dibenzofuran	167
1,2-Dichlorobenzene	167
1,3-Dichlorobenzene	167
1,4-Dichlorobenzene	167
3,3-Dichlorobenzidine	833
2,4-Dichlorophenol	167
Diethylphthalate	167
2,4-Dimethylphenol	167
Dimethylphthalate	167
Di-n-butylphthalate	167
4,6-Dinitro-2-methylphenol	167
2,4-Dinitrotoluene	167
Di-n-octylphthalate	167
2,4-Dinitrophenol	333
2,6-Dinitrotoluene	167
Fluoranthene	167
Fluorene	167
Hexachlorobenzene	167
Hexachlorobutadiene	167
Hexachlorocyclopentadiene	167
Hexachloroethane	167

Refer to footnotes at end of table.

Table 4.4.2.7.2-22 (Concluded)
Summary of SVOC Analytical MDLs for
SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling
September 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8270[a]) (μg/kg)
Indeno (1,2,3-cd) pyrene	167
Isophorone	167
2-Methylnaphthalene	167
2-Methylphenol	167
4-Methylphenol	167
Naphthalene	167
2-Nitroaniline	167
3-Nitroaniline	167
4-Nitroaniline	167
Nitrobenzene	167
2-Nitrophenol	167
4-Nitrophenol	167
n-Nitroso-di-n-propylamine	167
n-Nitrosodiphenylamine	167
Pentachlorophenol	167
Phenanthrene	167
Phenol	167
Pyrene	167
1,2,4-Trichlorobenzene	167
2,4,5-Trichlorophenol	167
2,4,6-Trichlorophenol	167

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-23
Summary of VOC Analytical MDLs for
SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling
September 1996
(Off-Site Laboratory)

Analyte	MDL (EPA Method 8240[a]) (μg/kg)
Acetone	2
Benzene	1
Bromodichloromethane	1
Bromoform	1
Bromomethane	1
2-Butanone	2
Carbon Disulfide	2
Carbon Tetrachloride	1
Chlorobenzene	1
Chloroethane	1
Chloroform	1
Chloromethane	1
Dibromochloromethane	1
1,1-Dichloroethane	1
1,2-Dichloroethane	1
cis-1,2-Dichloroethene	1
trans-1,2-Dichloroethene	1
1,1-Dichloroethene	1
1,2-Dichloropropane	1
cis-1,3-Dichloropropene	1
trans-1,3-Dichloropropene	1
Ethylbenzene	1
2-Hexanone	2
4-Methyl-2-pentanone	2
Methylene Chloride	1
Styrene	1
1,1,2,2-Tetrachloroethane	1
Tetrachloroethene	1
Toluene	1
1,1,1-Trichloroethane	1
1,1,2-Trichloroethane	1
Trichloroethene	1
Vinyl Acetate	2
Vinyl Chloride	1
Xylene (Total)	2

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 4.4.2.7.2-24
Summary of SWMU 58, Feature 58CCC (Building 9805 Drainpipe) Soil Sampling
Gamma Spectroscopy Analytical Results
September 1996
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)							
					Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error	Result	Error[c]	Result	Error[c]	Result	Error[c]
05875	58DP-001-0-SS	Soil	09-24-96	0–0.5	0.125	0.0251	0.613	0.833	0.0943	0.142	**ND (3.13)**	--
05875	58DP-002-0-SS	Soil	09-24-96	0–0.5	0.0682	0.0368	0.642	0.319	**ND (0.210)**	--	**ND (3.07)**	--
05875	58DP-003-3-SS	Soil	09-24-96	3.0–3.5	ND (0.0317)	--	**1.10**	0.512	**ND (0.224)**	--	**ND (3.24)**	--
05875	58DP-004-3-SS	Soil	09-24-96	3.0–3.5	ND (0.0328)	--	**1.07**	0.494	**ND (0.218)**	--	**ND (3.18)**	--
05875	58DP-005-0-SS	Soil	09-24-96	0–0.5	0.0120	0.0101	0.642	0.909	**ND (0.197)**	--	**ND (2.86)**	--
05875	58DP-006-0-SS	Soil	09-24-96	0–0.5	0.125	0.0290	0.583	0.285	**ND (0.192)**	--	**ND (2.68)**	--
Background Activities—Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.

[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.

[b]Analysis request/chain-of-custody record.

[c]Two standard deviations about the MDA.

[d]Dinwiddie September 1997.

58DP = SWMU 58 Building 9805 Drainpipe (Feature 58CCC).
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

The TB samples were analyzed off site for VOCs. Acetone and 2-butonone were detected at a J (estimated) value.

RPDs were calculated for metals detected in the primary and duplicate sample sets analyzed by GEL for SWMUs 58OO, 58SS, 58AAA, and 58CCC. The RPDs are presented in Tables 4.4.2.7.2-25 through 4.4.2.7.2-28. Three of the four sample pairs exceeded the RPD limit for arsenic, barium, beryllium, cadmium, chromium, nickel, selenium, silver, and zinc. Although the RPDs presented in Tables 4.4.2.7.2-25 through 4.4.2.7.2-28 exceed the RPD limit, the values are typical of the heterogeneous uncontaminated soil and are therefore acceptable.

Data Validation Results for SWMU 58—Miscellaneous Sites

The off-site laboratory results from GEL were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For AR/COC 05480, validation qualifications were applied to the organic data for soil sample results. The VOC samples did not meet temperature sample preservation requirements, and the results were qualified as estimated. Acetone and 2-butanone were detected in the VOC TB, and were qualified as nondetect. No other sample results were qualified.

For AR/COC 05822, validation qualifications were applied to the metal and organic data for soil and aqueous sample results. Chromium was detected in both the aqueous method blank and EB samples, and the results were qualified as estimated. Barium and chromium were detected in the aqueous method blank, and the FB sample results were qualified as estimated. Silver was detected in the soil method blank, and results that were less than five times the blank concentration were qualified as estimated. The VOC analysis for soil was performed after the acceptable holding time, and the results were qualified as nondetect, estimated. The LCS percent recovery did not meet QC limits for 2-chlorophenol, 1,4-dichlorbenzene, 4-chloro-3-methylphenol, and acenaphthene, and the results were qualified as nondetect, estimated. The LCS percent recovery for 4-nitophenol did not meet QC limits, and the result was qualified as rejected. The LCS/LCSD RPD was outside QC limits for phenol, n-nitroso-di-n-propylamine, 1,2,4-trichlorobenzene, and 2,4-dinitrotoluene, and the results were qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 06583, validation qualifications were applied to the metal and organic data for aqueous sample results. Silver was detected in the method blank, and the result was qualified as estimated. The LCS/LCSD percent recoveries were outside QC limits for beryllium, chromium, silver, lead, arsenic, and selenium, and the results were qualified as estimated. The CCV percent difference for benzoic acid and hexachlorocyclopentadiene were outside QC limits, and the results were qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 06626, validation qualifications were applied to the metals data for soil sample results. Beryllium, cadmium, chromium, nickel, silver, lead, and selenium were outside the QC

Table 4.4.2.7.2-25
Summary of SWMU 58, Feature 58OO Field Duplicate Relative Percent Difference Values
April 1997
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
06626	58BH-005-055-SA 58BH-007-055-DU	55.0–56.0	103.41	83.57	1.46	124.26	33.94	NA	18.08	17.52	29.55	28.72	NC	5.81

[a]Analysis request/chain-of-custody record.
58BH = SWMU 58, Feature OO Borehole.
DU = Soil sample duplicate.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
NA = Not analyzed.
NC = Not calculated for nondetected results or laboratory estimated values.
SA = Subsurface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-26
Summary of SWMU 58, Feature 58SS Field Duplicate Relative Percent Difference Values
January 1999
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
600347	S58BH1-GR-003-15-S S58BH1-GR-003-15-SD	15.0–16.0	7.88	10.04	15.52	0.77	13.11	NA	3.13	NC	3.94	NC	NC	NA

[a]Analysis request/chain-of-custody record.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not analyzed.
NC = Not calculated for nondetected results or laboratory estimated values.
S = Subsurface soil sample.
S58BH1 = SWMU 58, Borehole (Feature 58SS).
SD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-27
Summary of SWMU 58, Feature 58AAA Field Duplicate Relative Percent Difference Values
January 1999
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
601333	S58BHB-GR-004-4-SS S58BHB-GR-105-4-SD	4.0–4.5	49.45	55.32	38.01	1.17	15.63	NA	22.75	NC	9.45	4.95	48.97	NA

[a]Analysis request/chain-of-custody record.
S58BHB = SWMU 58, Borehole (Feature AAA).
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not analyzed.
NC = Not calculated for nondetected results or laboratory estimated values.
SD = Soil sample duplicate.
SS = Subsurface soil sample.
SWMU = Solid Waste Management Unit.

Table 4.4.2.7.2-28
Summary of SWMU 58, Feature 58CCC Field Duplicate Relative Percent Difference Values
September 1996
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
05822	58DP-001-0-SS 58DP-001-0-SD	0–0.5	22.91	7.61	23.29	26.34	41.33	NA	10.23	NC	17.98	NC	23.69	38.49

[a]Analysis request/chain-of-custody record.
58DP = SWMU 58, Feature CCC Drainpipe.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
NA = Not analyzed.
NC = Not calculated for nondetected results or laboratory estimated values.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

limits in the MS/MSD, and the results were qualified as estimated. No other sample results were qualified.

For AR/COC 601310, validation qualifications were applied to the metal, organic, and radiochemical data for soil and aqueous sample results. Silver was detected in the method blank, and the results were qualified as estimated in the associated samples. The recovery for barium in the MS was outside QC limits, and the result was qualified as estimated. Methylene chloride was detected in the aqueous method blank, and the results were qualified as estimated. The tetryl MS/MSD was outside QC limits, and all nondetect sample results were qualified as nondetect, estimated. No QC samples were analyzed with the radiochemical samples, and the results were therefore qualified as estimated. No other sample results were qualified.

For AR/COC 601331, validation qualifications were applied to the organic data for aqueous sample results. An EB and FB were analyzed outside the holding time for SVOCs, and the results were qualified as nondetect, estimated. No MS/MSD, LSCD or field duplicate were analyzed with the VOC samples. All positive VOC sample results were qualified as estimated, and all nondetected VOC sample results were qualified as nondetect, estimated. TPH was detected in the method blank, and the result was qualified as not detected. No other sample results were qualified.

For AR/COC 601333, validation qualifications were applied to the metal and organic data for soil and aqueous sample results. The recovery for barium in the MS was outside QC limits, and the result was qualified as estimated. All soil SVOC surrogate compounds were excessively diluted in the sample preparation stage, and all sample results were therefore qualified as rejected. No MS/MSD, LSCD or field duplicate were analyzed with the VOC samples. All positive VOC sample results were qualified as estimated, and all nondetected VOC sample results were qualified as nondetect, estimated. TPH was detected in the method blank, and the result was qualified as nondetect. The tetryl MS/MSD was outside QC limits, and all nondetected sample results were qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 601349, validation qualifications were applied to the metal and organic data for soil sample results. Mercury was detected in the method blank, and the positive results were qualified as estimated. The initial calibration response for 4-methyl-2-pentanone was outside QC limits, and the result was qualified as nondetect, estimated. The CCV was outside QC limits for acetone and 4-nitrophenol, and the sample results were qualified as nondetect, estimated. Methylene chloride was detected in the method blank, and the sample results were qualified as nondetect. No other sample results were qualified.

4.5 Investigation 4—Housekeeping Activities, VCMs, and VCAs

This section discusses the housekeeping activities, VCMs, and VCAs conducted at SWMUs 8 and 58. Section 4.5.1 addresses the housekeeping activities conducted at SWMUs 8 and 58. Sections 4.5.2, 4.5.3, and 4.5.4 address the VCM/VCAs conducted at SWMUs 8PP/8RR, 8Y/58B, and the SWMU 58 UCS, respectively.

4.5.1 Housekeeping Activities

4.5.1.1 Debris Removal Activities, January–June 1998

Debris removal housekeeping activities, conducted from January through June 1998, involved the removal of surface and near-surface debris at SWMUs 8 and 58. The housekeeping activities were performed continuously by SNL/NM personnel throughout the entire site. The debris removed included scrap metal (rebar, corrugated metal, metal fragments, wire, nails, pipe, and slag), asphalt, wood, concrete, plastic, firebrick, and ACM. The ACM consisted primarily of transite tiles. Except for the batteries and ACM, the debris was removed and disposed of as nonregulated waste. The batteries and ACM were disposed of as hazardous waste and asbestos waste, respectively.

Before removal took place, all of the debris was visually inspected, surveyed with a metal detector (if necessary), and field-screened to determine the presence or absence of organic or radiological contamination. No contamination was found during the housekeeping activities based upon field-screening results. The soil beneath the debris was also field-screened and found to be free of organic or radiological contamination.

In summary, approximately 30 cubic yards of nonregulated debris and 10 cubic yards of ACM were removed from the SWMU 8 features in January 1998. In addition, about 15 cubic yards of ACM was removed from SWMUs 58FF, 58I, 58O, and the vicinity from March through May 1998. Approximately 40 cubic yards of nonregulated debris, 2 cubic feet of batteries, and 0.5 cubic yards of ACM were removed from various SWMU 58 features from May through June 1998.

4.5.1.2 Concrete Removal Activities, January–February 1999

Concrete removal housekeeping activities, conducted from January through February 1999, involved approximately 500 cubic yards of concrete primarily located at 13 individual features throughout SWMUs 8 and 58 (58-1 through 58-13 shown in Figure 4.5.1.2-1). Before any removal activities took place, SNL/NM received approval from the NMED DOE Oversight Bureau to remove the concrete (Byrd September 1996).

Before removal of the concrete occurred, SNL/NM radiological control technicians (RCTs) surveyed each concrete chunk for radiological contamination; no elevated radiation was detected. In addition, SNL/NM ER technicians inspected the concrete chunks and found no visible stains or contamination. SNL/NM personnel removed the concrete, and KAFB personnel transported the concrete to the KAFB Landfill. SNL/NM radiation survey and swipe data for the concrete are archived in the SNL/NM ER Records Center.

4.5.1.3 Debris Removal Activities, December 1998—March 1999

Another major housekeeping effort was conducted throughout SWMUs 8 and 58 from December 1998 through March 1999, which involved the removal of surface and near-surface

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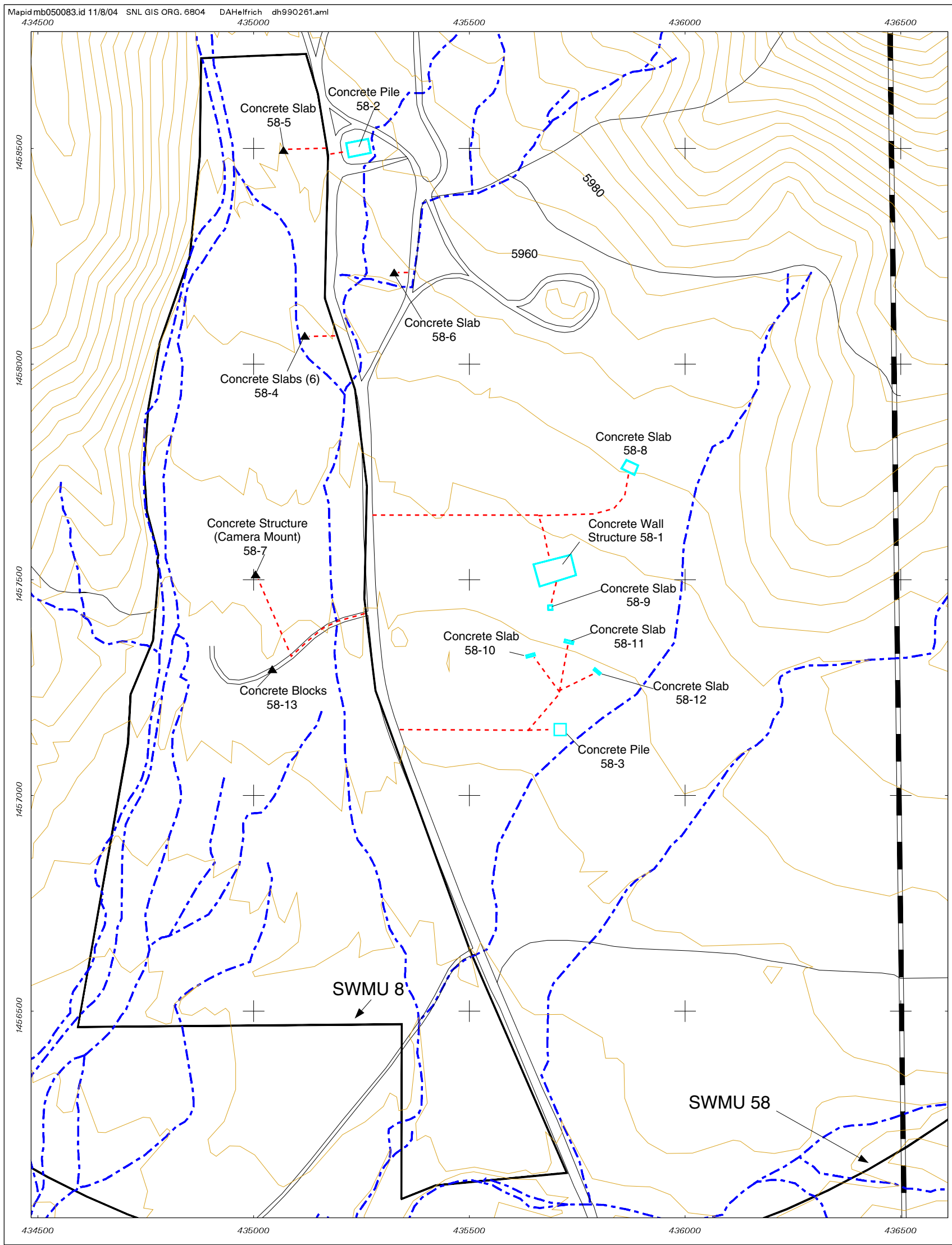

Legend

- Concrete Feature
- Road
- 10-Foot Contour
- Surface Drainage
- Access Route
- SWMU 8/58 Boundary
- KAFB/USFS Withdrawn Area Boundary
- Concrete Feature / Structure

Figure 4.5.1.2-1
Concrete Features removed at SWMUs 8 and 58
January through February 1999

0 250 500
Scale in Feet
0 60 120
Scale in Meters

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debris. Figure 4.5.1.3-1 depicts the areas and types of debris removed, which consisted of the following:

- 44 housekeeping features (HK-1 through HK-44 in Figure 4.5.1.3-1) scattered throughout SWMUs 8 and 58
- Seven battery areas at SWMUs 8 and 58
- Three firebrick debris areas at SWMU 58
- Two areas at SWMU 58 with plastic sheeting
- One area with wooden poles and a metal pipe extending out of the ground at SWMU 58
- Approximately 1 cubic yard of transite tile scattered throughout SWMUs 8 and 58

Before removal took place, the debris was inspected for stains or discoloration, surveyed with a metal detector (if necessary), and field-screened to determine the presence or absence of organic or radiological contamination. With the exception of Firebrick Area No. 2, no contamination was found in the debris during the housekeeping activities based upon field inspection/ screening, and no soil sampling was required. A slight amount of radiation contamination was found in the soil and on debris at Firebrick Area No. 2, and the characterization and remediation activities performed at this area are discussed in detail in Section 4.5.1.3.3.

The debris removed during the housekeeping activities included approximately 150 cubic yards of scrap metal (rebar, I-beams, corrugated metal, metal fragments, wire, nails, pipe, and slag), asphalt, wood, concrete and mortar, plastic, firebrick, and transite. With the exception of materials from Firebrick Area No. 2, these materials were removed and managed as nonregulated or asbestos waste. The debris removed from Firebrick Area No. 2 was managed as radiological, mixed, or asbestos waste.

4.5.1.3.1 Housekeeping Feature Removal Activities

Forty-four housekeeping features (HK-1 through HK-44 in Figure 4.5.1.3-1) that included partially buried concrete, asphalt, cable, metal scrap, eyebolts, components (e.g., capacitors), potential UXO, wire, wood, and ACM (transite) tiles were removed using a backhoe, small front-end loader, or shovels. The ACM tiles were managed as asbestos waste. The remainder of debris was managed as nonregulated waste. With the exception of the ACM, no regulated materials or radiological waste were found at these features based upon the results of field-screening and visual inspection. The waste removed was collected and placed into 55-gallon drums and/or roll-off containers and disposed of off site.

4.5.1.3.2 Battery Areas

Seven areas shown in Figure 4.5.1.3-1 that contained battery debris were cleaned up. The batteries were found lying on the surface of the areas. Several pieces of one or two small batteries were found at each of the areas. The battery parts were 4 to 6 inches in size and were

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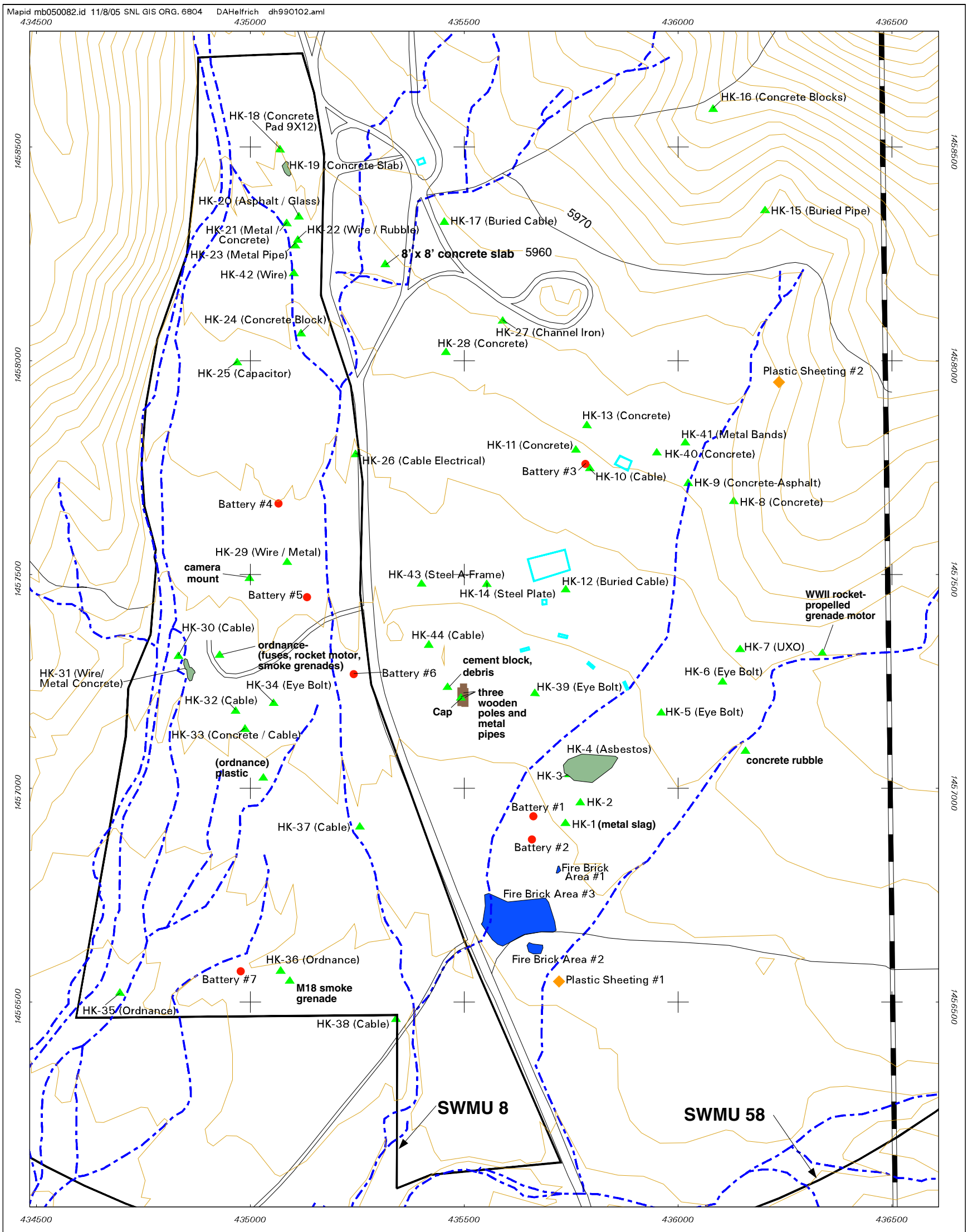

Legend

- Housekeeping Feature (HK-1 through HK-44)
- Battery Area
- Firebrick Debris Area
- Plastic Sheeting
- Wooden Poles and Metal Pipe
- Road
- 10 Foot Contour
- Surface Drainage
- SWMU 8/58 Boundary
- KAFB/USFS Withdrawn Area Boundary
- Building Structure
- Housekeeping Area Feature

Figure 4.5.1.3-1
Housekeeping Activity Features removed at SWMUs 8 and 58 December 1998 through March 1999

0 250 500
Scale in Feet
0 60 120
Scale in Meters

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heavily deteriorated. Based upon the soil characterization information, the batteries were removed and disposed of off site.

Soil from nearby locations at SWMU 58 contained similar deteriorated batteries lying directly on the surface. The soil in these areas was not stained, was field-screened for organic and radiological contamination, and showed no visible evidence of contamination. Nevertheless, the soil was sampled and characterized for metal contamination (i.e., lead); no contamination was found at these locations. Therefore, based upon this knowledge, the soil from the seven battery areas addressed in this report was not sampled and is considered free of contamination.

4.5.1.3.3 SWMU 58 Firebrick Debris Areas

Firebrick Area No. 1 (SWMU 58VV)

Several firebricks mixed with minimal amounts of metal slag and ACM (transite) were removed from the surface at Firebrick Area No. 1 (Figure 4.5.1.3-1) on January 7, 1999. The firebrick was found at random locations, unbroken and in small chunks. Some of it showed evidence of burning. No evidence of testing was present in the surrounding soil at this area.

Before removal activities took place, the firebrick and associated debris were field-screened for organic and radiological contamination and found to be uncontaminated. After the debris was removed, the entire area (approximately 18 by 25 feet in size) was surveyed for radioactivity by an SNL/NM RCT. The survey was conducted by traversing across the site (north-south), starting from the western edge and working eastward. The survey was performed on January 19, 1999, and no elevated levels of radioactivity were detected (Mignardot January 1999).

Firebrick Area No. 2 (SWMU 58TT)

Debris consisting of firebricks, metal slag/filings, wire, concrete, several pieces of potential UXO, and ACM (transite) were found at Firebrick Area No. 2 (Figure 4.5.1.3-1). Initially, the debris and surrounding area were surveyed for elevated levels of radioactivity by an SNL/NM RCT on January 19, 1999 (Mignardot January 1999). The surface area surveyed covered approximately 30 by 90 feet.

Based upon the radiation survey, four primary areas with elevated radioactivity were identified: two small piles of metal slag/filings, an area of contaminated soil, and a firebrick wall. The remains of the firebrick wall were approximately 6 feet in length and several inches in height. Beneath the wall were 12 concrete blocks lying adjacent to each other. The base of the blocks extended 3 feet bgs. The two piles of metal slag/filings contained up to 8,060 counts per minute (cpm) beta-gamma activity, and up to 760 cpm beta-gamma activity was detected in the associated contaminated soil. Background activity at this area is 60 cpm. The wire, ACM (transite), and potential UXO were not radioactively contaminated based upon field-screening results.

The debris and contaminated soil were removed from this area during February and March 1999 and were disposed of off site as nonregulated, radioactive, and mixed waste. The ACM (transite) was disposed of as asbestos waste.

A final radiation survey took place on March 8, 1999, and no additional surface radiation anomalies were detected. The results of confirmatory sampling are discussed in Section 4.4.2.

Firebrick Area No. 3 (SWMU 58UU)

Debris consisting of firebricks, metal slag and wire, concrete, and transite were removed from the surface at Firebrick Area No. 3 (Figure 4.5.1.3-1) on January 7, 1999. The firebrick was found at random locations, unbroken and in small chunks, and some of it showed evidence of burning. No evidence of testing was present in the surrounding soil at this area. The debris was screened for organic and radiological contamination prior to removal, and no contamination was detected. Following removal activities, the entire area was surveyed for radiation by an SNL/NM RCT on January 25, 1999, and found to be free of contamination (Mignardot January 1999).

4.5.1.3.4 SWMU 58 Plastic Sheeting Areas

Plastic sheeting was found crumpled and lying on the ground at two areas within SWMU 58 (Figure 4.5.1.3-1). The sheeting was field-screened for organic and radiological contamination, and was uncontaminated. The sheeting was disposed of as nonregulated waste. Because the soil was not disturbed, no additional investigative activities were performed at these areas.

4.5.1.3.5 Area Containing Wooden Poles and Galvanized Metal Pipe (SWMU 58WW)

Three wooden telephone poles that were upright in the ground and approximately 12 feet long were removed from an area in the central portion of SWMU 58 (Figure 4.5.1.3-1). The poles were screened for radioactivity and were not contaminated. The poles were removed and disposed of as nonregulated waste. A galvanized pipe located at the center of the poles was investigated, and soil adjacent to the pipe was sampled. Section 4.4.2 presents a detailed discussion of this RFI sampling event.

4.5.2 SWMUs 8PP and 8RR Area of Open Burning VCM and VCA Activities

4.5.2.1 Nonsampling Data Collection

During multiple inspections, electronic debris containing numerous pieces of metal slag was identified at the Area of Open Burning at SWMU 8 (SWMUs 8PP and 8RR) (SNL/NM June 1995).

4.5.2.2 VCM and VCA Activities at SWMUs 8PP and 8RR (Area of Open Burning)

In accordance with the SNL/NM VCM Plan for Removal of Radioactive Surface Contamination at Environmental Restoration Sites (SNL/NM April 1994), VCM activities were conducted at SWMUs 8PP and 8RR in June 1997 and August 1998. The VCMs were performed to remove surface debris and remediate surface and subsurface soil contamination (primarily lead and radionuclides). In addition, a VCA was conducted during January and February 2004 at various features to remove the remaining debris and metal-contaminated surface and subsurface soil (SNL/NM January 2004).

June 1997 VCM

The initial VCM at SWMUs 8PP and 8RR, conducted in June 1997, involved the removal of all surface debris and associated soil in six areas. The VCM encompassed an area of approximately 50 by 70 feet, and approximately 0.94 cubic yards of debris and metal-contaminated soil were removed. The debris consisted of metal slag and fragments and deteriorated batteries (Figure 4.5.2.2-1). Shovels and rakes were used to remove the slag, metal debris, and soil from each of the six areas. A sifting screen was used to segregate the radiologically contaminated slag from the noncontaminated soil. Two large pieces of radiologically contaminated metal (one large metal sheet and one large metal ring) were removed.

Because the soil was removed during the VCA conducted in January 2004, the analytical results from the June 1997 sampling are not pertinent to this CAC proposal, and are presented in Tables B-12 and B-13, in Annex B.

August 1998 VCM

Because additional radiation anomalies were identified at SWMUs 8PP and 8RR during the final radiological survey for the June 1997 VCM, a second surface VCM was conducted at this site in August 1998. Two additional radiation anomalies were located near the initial anomalies and probably were a result of surface erosion.

The August 1998 VCM involved mowing the entire site to remove weeds and grass and surveying the site for radiation anomalies. The area surveyed covered approximately 150 by 175 feet (Figure B-3 of Annex B). The two anomalies were identified and removed, which included approximately 0.35 cubic yards of radiologically contaminated metal slag and soil. Each anomaly is described as follows:

- Anomaly AOB-W1, located in the western half of the site (Figure B-3 of Annex B), was 1 by 2 feet by 1 foot deep in size.

- Anomaly AOB-E1, located in the eastern half of the site (Figure B-3 of Annex B), was 4 by 6 feet by 3 inches deep in size.

Because the soil was removed during the VCA conducted in January 2004, the analytical results from the August 1998 sampling are not pertinent to this CAC proposal, and are presented in Tables B-14 and B-15, in Annex B.

January 2004 VCA

The January 2004 VCA was conducted to remove metal-contaminated soil (primarily lead) scattered throughout the site. Prior to the VCA, additional soil samples were collected at SWMUs 8PP and 8RR in June and July 1999 and again in March 2000 to further characterize the areal extent of metals contamination at the site. The pre-VCA characterization activities are discussed as follows:

- In June and July 1999, 96 surface soil samples and 6 subsurface soil samples were collected from a grid area at SWMUs 8PP and 8RR (Figure B-4 in Annex B). The surface and subsurface samples were collected at the 0- to 6-inch and 6- to 12-inch depth intervals, respectively. The RFI surface and subsurface soil

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Figure 4.5.2.2-1
Photograph of metal slag fragments
at Area of Open Burning
(Features 8PP and 8RR)

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analyses indicated elevated levels of COCs (primarily lead). Elevated lead concentrations were found in 26 of 96 surface samples at levels above 400 mg/kg. In addition, three of six subsurface samples contained lead concentrations greater than 400 mg/kg. Because the soil sampled during this RFI sampling was removed during the January 2004 VCA, the sampling results are provided for informational purposes only (see Table B-16, Annex B).

- In March 2000, 11 surface soil samples and 12 subsurface soil samples were collected at SWMUs 8PP and 8RR (Figure B-5 in Annex B). The soil samples were collected at the 0- to 6-inch to 18- to 24-inch depth intervals. The RFI surface soil analyses indicated elevated levels of COCs (primarily lead). Elevated lead concentrations were found in 1 of 11 surface samples at a concentration greater than 400 mg/kg. None of the subsurface soil samples had lead concentrations greater than 400 mg/kg. Because the soil sampled during this RFI sampling was removed during the VCA conducted in January 2004, the sampling results are included for informational purposes only (Tables B-17 and B-18 in Annex B).

The January 2004 VCA activities commenced on January 30, 2004, and were completed on March 15, 2004. The VCA involved the removal of metal-contaminated soil and debris, which consisted of pieces of deteriorated metal parts and wire, using a bulldozer and backhoe. The VCA was performed over two distinct areas: 1) a 6-inch-deep layer of contaminated soil was removed from an area in the northern part of the site, and 2) a 12-inch-deep layer of contaminated soil was removed from an area in the southern portion of the site. The entire remediation was performed over an area of approximately 50 by 70 feet (Figure 4.5.2.2-2). Approximately 75 cubic yards of metal-contaminated soil and 16 pounds of metal debris were removed. Upon completion of the excavation and confirmatory sampling, the site was restored to its original condition.

4.5.2.3 Sampling Activities at SWMUs 8PP and 8RR (Area of Open Burning)

Following the June 1997 VCM, a total of six confirmatory surface soil samples were collected from the six debris areas remediated during this VCM. The sample locations are shown in Figure B-2 of Annex B. The samples were analyzed for metals and radionuclides by gamma spectroscopy. Because the soil was removed during the VCA conducted in January 2004, the analytical results, presented in Tables B-12 and B-13, respectively, in Annex B are not pertinent to this CAC proposal.

Following the August 1998 VCM, one confirmatory soil sample was collected from the two radiation anomalies remediated during this VCM. The sample locations are shown in Figure B-3 of Annex B. The samples were analyzed for metals and radionuclides by alpha/gamma spectroscopy. Because the soil was removed during the VCA conducted in January 2004, the analytical results, presented in Tables B-14 and B-15, respectively, in Annex B, are not pertinent to this CAC proposal.

Following the January 2004 VCA, ten confirmatory surface soil samples were collected from the area remediated during this VCA. The sample locations are shown in Figure 4.5.2.3-1. All samples were collected at 0- to 6-inch depth intervals. The samples were analyzed for metals and radionuclides by gamma spectroscopy, and the analytical results are presented in

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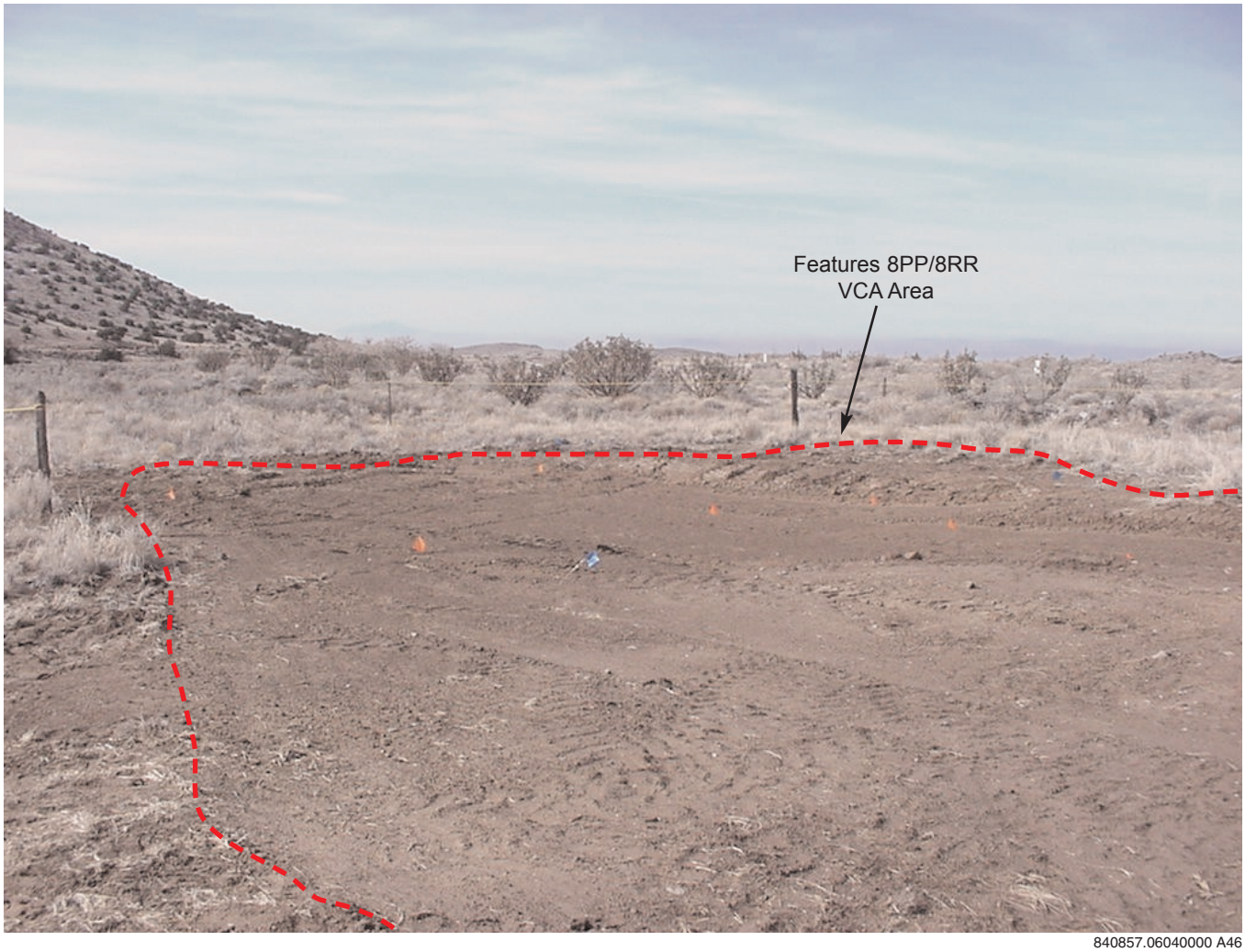

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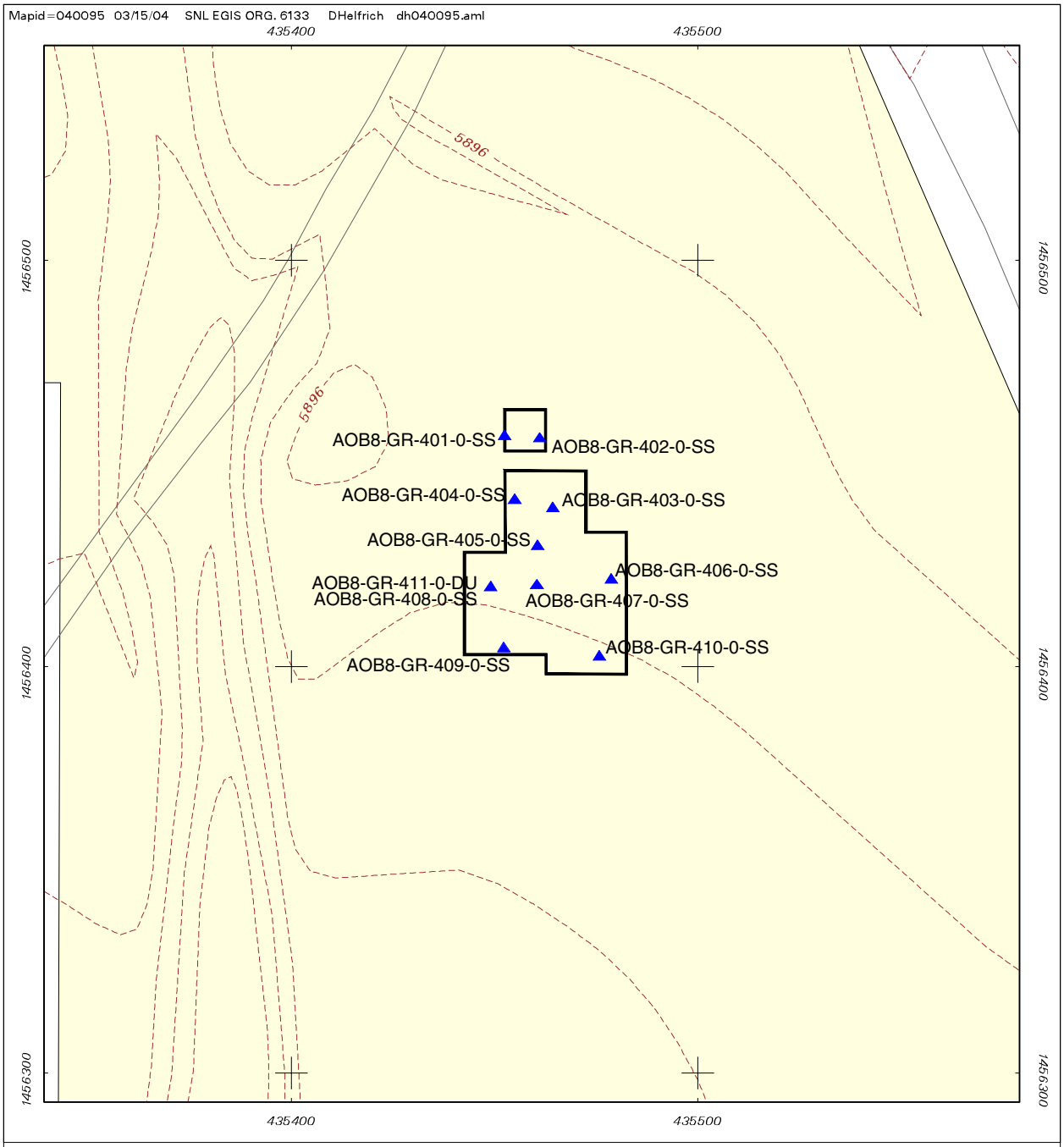
Figure 4.5.2.2-2
Remediated Area at Area of Open Burning
(Features 8PP and 8RR), February 2004.
View to the southwest.



Legend

- Soil sample location
- Unpaved Road
- 2-ft Contour
- Remediation Area
- SWMU 8

Figure 4.5.2.3-1
Confirmatory sample locations
at Area of Open Burning
(Features 8PP and 8RR),
January-February 2004

0 20 40
Scale in Feet

0 4.8 9.6
Scale in Meters

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Tables 4.5.2.3-1 and 4.5.2.3-2. Metals were analyzed by GEL and SNL/NM RPSD performed the gamma spectroscopy analysis.

Sampling Results for SWMUs 8PP and 8RR (Area of Open Burning)

Three of the six confirmatory samples collected during the June 1997 VCM contained silver levels above the background limit of less than 0.5 mg/kg. All six samples contained cadmium, copper, lead, and zinc levels above the background limits of 0.64, 17.1, 18.9, and 52.1 mg/kg, respectively. Three of the samples contained nickel and chromium levels above the background limits of 16.6 and 18.8 mg/kg, respectively. Two of the seven samples contained uranium-238 above the background activity. In all other samples, cesium-137, thorium-232, uranium-235, and uranium-238 activity levels were either nondetect or near background values. These results are shown in Annex B, Tables B-10 and B-11.

One of the two August 1998 VCM confirmatory samples collected contained levels of lead above the background limit of 18.9 mg/kg. Both samples contained cesium-137 activity levels below the background limit of 1.55 pCi/g. Both samples contained elevated uranium-238 activities of 8.67 and 2.73 pCi/g, above the background limit of 2.31 pCi/g. One sample contained elevated thorium-232 activity of 1.07 pCi/g, compared to a background limit of 1.03 pCi/g. One sample contained elevated uranium-235 activity of 0.18 pCi/g, compared to a background limit of 0.16 pCi/g.

None of the confirmatory samples collected during the January 2004 VCA had metals concentrations above background limits. One sample collected contained a thorium-232 activity of 1.07 pCi/g, which is above the background activity level of 1.03 pCi/g. All the analyses for uranium-235 had MDAs above the background limit of 0.16 pCi/g. The MDAs ranged from 0.232 to 0.277 pCi/g. These results are shown in Annex B, in Tables B-12 and B-13. Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

4.5.2.4 Data Quality for SWMUs 8PP and 8RR (Area of Open Burning)

QA/QC field samples collected in February 2004 as part of the final VCA conducted in January 2004 included one EB and one duplicate sample. The EB was analyzed off site for metals. Metal concentrations were slightly greater than the MDLs for barium, beryllium, and chromium. The concentrations of barium, beryllium, and chromium were below the PQL, and the results were qualified as J (estimated) values. No QA/QC samples were collected for radionuclide analyses.

RPDs were calculated for metals detected in the primary and duplicate samples, which were analyzed by GEL. The RPDs are presented in Table 4.5.2.4-1. The metals analyses for the sample pair for chromium and mercury yielded RPDs that exceeded the acceptable RPD limit of less than 25 percent (Table 4.5.2.4-1). Although the RPDs presented in Table 4.5.2.4-1 exceed the RPD limit, the values are typical of the heterogeneous uncontaminated soil and are therefore acceptable.

Table 4.5.2.3-1
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Confirmatory Soil Sampling
Metals Analytical Results
February 2004
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010, 7470/7471, and 8080/8081[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium
607176	AOB8-GR-401-0-SS	Soil	02-09-04	0–0.5	4.60	184 J	0.746 J	0.0581 J (0.499)	14.1
607176	AOB8-GR-402-0-SS	Soil	02-09-04	0–0.5	4.01	187 J	0.712 J	ND (0.0475)	13.5
607176	AOB8-GR-403-0-SS	Soil	02-09-04	0–0.5	4.29	196 J	0.726 J	ND (0.0476)	14.1
607176	AOB8-GR-404-0-SS	Soil	02-09-04	0–0.5	3.29	154 J	0.642 J	ND (0.0475)	13.0
607176	AOB8-GR-405-0-SS	Soil	02-09-04	0–0.5	3.99	175 J	0.659 J	ND (0.0472)	12.8
607176	AOB8-GR-406-0-SS	Soil	02-09-04	0–0.5	4.00	166 J	0.642 J	0.0823 J (0.498)	12.0
607176	AOB8-GR-407-0-SS	Soil	02-09-04	0–0.5	3.68	146 J	0.576 J	ND (0.0477)	11.5
607176	AOB8-GR-408-0-SS	Soil	02-09-04	0–0.5	3.89	170 J	0.659 J	ND (0.0469)	12.4
607176	AOB8-GR-409-0-SS	Soil	02-09-04	0–0.5	3.77	152 J	0.607 J	ND (0.0474)	11.4
607176	AOB8-GR-410-0-SS	Soil	02-09-04	0–0.5	3.40	149 J	0.579 J	ND (0.0475)	17.6
607176	AOB8-GR-411-0-DU[c]	Soil	02-09-04	0–0.5	3.62	153 J	0.589 J	ND (0.0469)	12.2
NMED-Approved Background Value—Canyon Area[d]		Soil	NA	NA	9.8	246	0.75	0.64	18.8
Quality Assurance/Quality Control Sample (mg/L)									
607176	AOB8-GR-433-0-EB	Water	02-09-04	NA	ND (0.00224)	0.000504 J (0.005)	0.000234 J (0.005)	ND (0.000313)	0.000631 J (0.005)

Refer to footnotes at end of table.

Table 4.5.2.3-1 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Confirmatory Soil Sampling
Metals Analytical Results
February 2004
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010, 7470/7471, and 8080/8081[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver
607176	AOB8-GR-401-0-SS	Soil	02-09-04	0–0.5	9.08	0.00801 J (0.00958)	13.8	ND (0.162)	0.0971 J (0.499)
607176	AOB8-GR-402-0-SS	Soil	02-09-04	0–0.5	8.79	0.00833 J (0.00985)	13.3	ND (0.161)	ND (0.0897)
607176	AOB8-GR-403-0-SS	Soil	02-09-04	0–0.5	9.17	0.00583 J (0.00982)	13.6	ND (0.161)	ND (0.0898)
607176	AOB8-GR-404-0-SS	Soil	02-09-04	0–0.5	7.98	0.00647 J (0.00963)	11.3	ND (0.161)	ND (0.0897)
607176	AOB8-GR-405-0-SS	Soil	02-09-04	0–0.5	9.73	0.00737 J (0.00985)	12.4	ND (0.160)	ND (0.0891)
607176	AOB8-GR-406-0-SS	Soil	02-09-04	0–0.5	9.75	0.00708 J (0.00951)	11.9	ND (0.161)	ND (0.0898)
607176	AOB8-GR-407-0-SS	Soil	02-09-04	0–0.5	7.98	0.00576 J (0.00988)	10.7	ND (8.09)	ND (0.090)
607176	AOB8-GR-408-0-SS	Soil	02-09-04	0–0.5	8.32	0.00758 J (0.00985)	12.2	ND (0.159)	ND (0.0884)
607176	AOB8-GR-409-0-SS	Soil	02-09-04	0–0.5	7.71	0.00759 J (0.0096)	11.2	ND (0.161)	ND (0.0895)
607176	AOB8-GR-410-0-SS	Soil	02-09-04	0–0.5	8.49	0.0126	12.0	ND (0.161)	ND (0.0897)
607176	AOB8-GR-411-0-DU[c]	Soil	02-09-04	0–0.5	9.51	0.00663 J (0.00997)	11.4	ND (0.159)	ND (0.0884)
NMED-Approved Background Value—Canyon Area[d]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5
Quality Assurance/Quality Control Sample (mg/L)									
607176	AOB8-GR-433-0-EB	Water	02-09-04	NA	ND (0.00172)	ND (0.000047)	ND (0.00069)	ND (0.00281)	ND (0.000835)

Refer to footnotes at end of table.

Table 4.5.2.3-1 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Confirmatory Soil Sampling
Metals Analytical Results
February 2004
(Off-Site Laboratory)

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample AOB8-GR-411-0-DU is a duplicate of AOB8-GR-410-0-SS (Features 8PP and 8RR).
[d]Garcia November 1998.

AOB8 = SWMU 8 Area of Open Burning.
DU = Duplicate sample.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
MDL = Method detection limit.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
VCA = Voluntary Corrective Action.

Table 4.5.2.3-2
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Confirmatory Soil Sampling
Gamma Spectroscopy Analytical Results
February 2004
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (EPA Method 900.1[b]) (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[c]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[d]	Result	Error[d]
607177	AOB8-GR-401-0-SS	Soil	02-09-04	0–0.5	ND (0.038)	--	0.755	0.275
607177	AOB8-GR-402-0-SS	Soil	02-09-04	0–0.5	ND (0.0436)	--	**1.07**	0.502
607177	AOB8-GR-403-0-SS	Soil	02-09-04	0–0.5	ND (0.0398)	--	0.795	0.385
607177	AOB8-GR-404-0-SS	Soil	02-09-04	0–0.5	ND (0.0372)	--	0.894	0.415
607177	AOB8-GR-405-0-SS	Soil	02-09-04	0–0.5	ND (0.0387)	--	0.815	0.409
607177	AOB8-GR-406-0-SS	Soil	02-09-04	0–0.5	ND (0.0381)	--	0.862	0.417
607177	AOB8-GR-407-0-SS	Soil	02-09-04	0–0.5	ND (0.0372)	--	0.873	0.408
607177	AOB8-GR-408-0-SS	Soil	02-09-04	0–0.5	ND (0.0362)	--	0.792	0.383
607177	AOB8-GR-409-0-SS	Soil	02-09-04	0–0.5	ND (0.0392)	--	0.811	0.387
607177	AOB8-GR-410-0-SS	Soil	02-09-04	0–0.5	ND (0.0396)	--	0.801	0.392
607177	AOB8-GR-411-0-DU[e]	Soil	02-09-04	0–0.5	ND (0.0419)	--	0.905	0.436
Background Soil Activities—Lower Canyons Area[f]		NA	NA	NA	1.55	NA	1.03	NA

Record Number[c]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Uranium-235		Uranium-238	
					Result	Error[d]	Result	Error[d]
607177	AOB8-GR-401-0-SS	Soil	02-09-04	0–0.5	**ND (0.239)**	--	ND (0.734)	--
607177	AOB8-GR-402-0-SS	Soil	02-09-04	0–0.5	**ND (0.277)**	--	ND (0.831)	--
607177	AOB8-GR-403-0-SS	Soil	02-09-04	0–0.5	**ND (0.239)**	--	ND (0.693)	--
607177	AOB8-GR-404-0-SS	Soil	02-09-04	0–0.5	**ND (0.234)**	--	ND (0.690)	--
607177	AOB8-GR-405-0-SS	Soil	02-09-04	0–0.5	**ND (0.240)**	--	ND (0.698)	--
607177	AOB8-GR-406-0-SS	Soil	02-09-04	0–0.5	**ND (0.243)**	--	0.648	0.311
607177	AOB8-GR-407-0-SS	Soil	02-09-04	0–0.5	**ND (0.232)**	--	ND (0.686)	--
607177	AOB8-GR-408-0-SS	Soil	02-09-04	0–0.5	**ND (0.233)**	--	ND (0.701)	--
607177	AOB8-GR-409-0-SS	Soil	02-09-04	0–0.5	**ND (0.241)**	--	ND (0.697)	--
607177	AOB8-GR-410-0-SS	Soil	02-09-04	0–0.5	**ND (0.242)**	--	ND (0.690)	--
607177	AOB8-GR-411-0-DU[e]	Soil	02-09-04	0–0.5	**ND (0.242)**	--	ND (0.728)	--
Background Soil Activities—Lower Canyons Area[f]		NA	NA	NA	0.16	NA	2.31	NA

Refer to footnotes at end of table.

Table 4.5.2.3-2 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Confirmatory Soil Sampling
Gamma Spectroscopy Analytical Results
February 2004
(On-Site Laboratory)

Note: Values in **bold** exceed background soil activities or have MDA values that exceed background soil activities.
[a]Thorium-232 and uranium-238 decay isotopes with a short half-life are not presented in this table.
[b]EPA November 1986.
[c]Analysis request/chain-of-custody record.
[d]Two standard deviations about the mean activity.
[e]Sample AOB8-GR-411-0-DU is a duplicate of AOB-GR-410-0-SS.
[f]Dinwiddie September 1997.
AOB8 = SWMU 8, Area of Open Burning (Features 8PP and 8RR).
DU = Duplicate sample.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected at or above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
VCA = Voluntary Corrective Action.
-- = Error not calculated for nondetect results.

Table 4.5.2.4-1
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCA Field Duplicate Relative Percent Difference Values
February 2004
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
607176	AOB8-GR-410-0-SS AOB8-GR-411-0-DU	0–0.5	6.27	2.65	1.71	NC	36.00	NA	11.00	62.00	5.00	NC	NC	NA

[a]Analysis request/chain-of-custody record.
AOB8 = SWMU 8, Area of Open Burning (Features 8PP and 8RR).
DU = Duplicate sample.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not analyzed.
NC = Not calculated for nondetected results or laboratory estimated values.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
VCA = Voluntary Corrective Action.

Data Validation Results for SWMUs 8PP and 8RR (Area of Open Burning)

The off-site laboratory results from GEL were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58. During data validation, qualifications were applied to some of the data. For AR/COC 607176, validation qualifications were applied to the metals data for soil and aqueous sample results. Barium and beryllium were detected in the calibration blanks, and the associated results were qualified as estimated. No other sample results were qualified.

4.5.2.5 Data Gaps for SWMUs 8PP and 8RR (Area of Open Burning)

No data gaps remained in the characterization of SWMUs 8PP and 8RR upon completion of the final January 2004 VCA.

4.5.2.6 Results and Conclusions for SWMUs 8PP and 8RR (Area of Open Burning)

The January 2004 VCA at SWMUs 8PP and 8RR characterized and removed the remaining metal-contaminated subsurface and surface soil and debris. Confirmatory sampling demonstrated that no elevated metals or radionuclides remained in the soil after completion of the VCA. Analytical results are included in the cumulative risk assessment for the entire site. The VCA area was restored to its original condition.

4.5.3 SWMUs 8Y and 58B VCM Activities

4.5.3.1 Nonsampling Data Collection

The CEARP report, discussed in Section 4.2.1, identified SWMU 8 as an area of potential contamination based upon a visual inspection of the site. SWMU 8Y was the location of a significant surface debris within SWMU 8. SWMU 58B was a SWMU 58 burn pit test location within the SWMU 8Y area. Housekeeping activities conducted at this area prior to RFI sampling, discussed in Section 4.3.6, removed all the large debris from the area. Visual surveys of the site, performed by ER Project personnel after the housekeeping activities, identified a significant amount of small pieces of debris mixed with the soil at the site. At several locations, pieces of charcoal and ash were also mixed with the soil (Figure 4.5.3.1-1). These inspections and surveys indicated that the soil remaining at the site was potentially contaminated. Visual inspection of the site also revealed that the impacted area was immediately adjacent to the major surface-water drainage in the area.

Figure 4.5.3.1-1
Photograph of charcoal and ash mixed with soil
Feature 58B pit.
View to the south.

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4.5.3.2 VCM Activities at SWMUs 8Y and 58B (Debris Pile and Pit)

The results of the 1996, 1997, and 1998 RFI sampling at SWMUs 8Y and 58B indicated that the surface soil at this location contained elevated levels of barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, HMX, and tritium. Tritium was detected in three samples at activities ranging from 654 to 949 pCi/L; the background activity is 420 pCi/L. Figure 4.4.1.5.1-1 shows the location of soil samples collected with elevated metal and HE concentrations. The RFI sampling results are provided; however, because the soil sampled was removed during the VCM, these results are included for informational purposes only (Annex B, Tables B-4 through B-9) and are not pertinent to this CAC proposal.
Based upon the RFI sampling results, a geophysical survey, and the visual evidence of debris remaining in the soil at the site, a VCM was planned. The VCM plan was developed and submitted to the NMED in August 1998 (SNL/NM August 1998). Comments on the VCM Plan received from NMED Hazardous Waste Bureau (HWB) personnel and from the DOE Public Meeting held on August 26, 1998, were addressed in the final plan. The VCM was conducted as described in the VCM Plan.

The location and extent of the VCM excavation is shown in Figure 4.4.1.5.1-1. Soil was removed from an area of approximately 8,800 square feet corresponding to the SWMU 8Y boundary (Figure 4.4.1.5.1-1). The first phase of the VCM began on September 16, 1998, and involved excavating 4 to 6 inches within the SWMU 58B pit. This included scraping the pit walls and floor. The next phase involved the removal of 4 to 6 inches of soil at grade in the SWMU 8Y area surrounding the pit. A 20-foot buffer zone was also excavated, which extended beyond the contaminated soil area. The areas were excavated until all metal and other debris were removed and undisturbed soil was encountered. Confirmatory soil sampling was performed to support a site-specific risk assessment. Waste was characterized by analytical results and disposed of off site. Approximately 220 yards of soil containing minimal amounts of debris were removed and disposed of as nonregulated solid waste.

On September 22, 1998, NMED HWB personnel inspected the post-VCM condition of SWMUs 8Y and 58B (Young September 1998). The inspection was requested to receive concurrence that the VCM was complete based upon visual evaluation of the site. The NMED agreed that the site was remediated and that the VCM was complete, unless analytical results indicated significant soil contamination. At the request of the NMED, the bottom of the SWMU 58B pit was marked with plastic tape before backfilling to identify the boundary of clean fill for further remediation if required based upon analytical results.

The SWMU 58B pit was backfilled with clean soil confirmed by sampling after the collection of confirmatory samples. The entire VCM area was then recontoured to prevent erosion. The disturbed area was reseeded and covered with vegetative matting. Subsequent inspection of the site during the next two years verified that native plants were growing, and no signs of erosion were identified (Figure 4.5.3.2-1).

4.5.3.3 Sampling Activities at SWMUs 8Y and 58B (Debris Pile and Pit)

Ten confirmatory soil samples plus one duplicate were collected before backfilling in the VCM excavation area at locations selected by NMED HWB personnel on September 22, 1998. Eight additional confirmatory samples were collected at selected locations around the VCM area to confirm that minor elevations in some parameters in the confirmatory sampling did not represent

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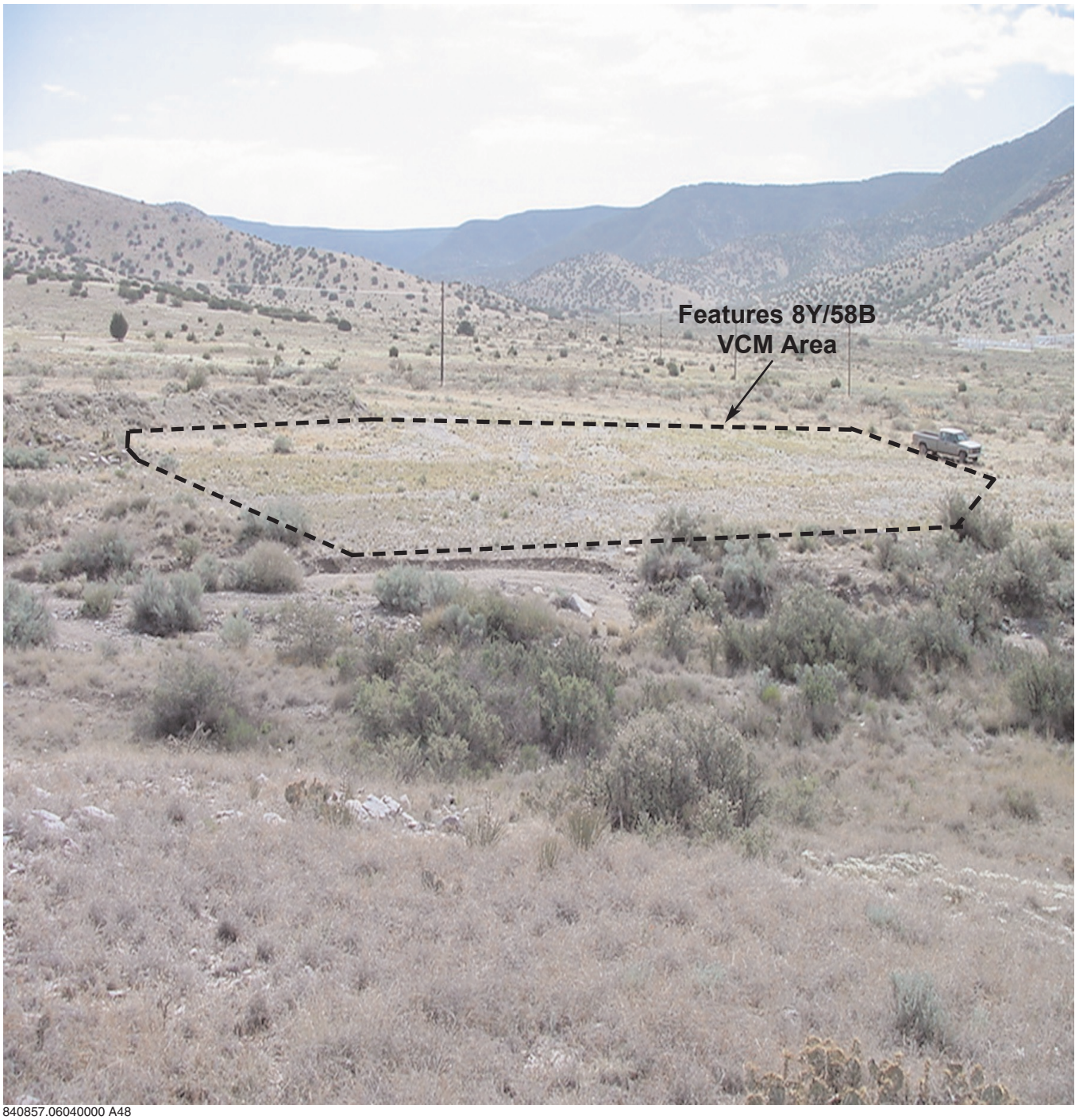

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Figure 4.5.3.2-1
Photograph of Features 8Y/58B following site remediation/restoration activities. View to southeast.

areas of contamination that would require further remediation. Sampling locations are shown in Figure 4.5.3.3-1. All samples were collected at 0- to 6-inch depth intervals.

Samples were analyzed for metals, total uranium, tritium, and HE compounds by either GEL or CORE Laboratory. All samples submitted for radiological parameters were analyzed by gamma spectroscopy at the on-site SNL/NM RPSD Laboratory.

4.5.3.4 Sampling Results for SWMUs 8Y and 58B (Debris Pile and Pit)

Table 4.5.3.4-1 presents the results of the metals analysis. The following results were above background values for cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc:

- Two samples contained cadmium at concentrations of 1.12 and 0.952 mg/kg, which are above the background limit of 0.64 mg/kg.
- One sample contained chromium at a concentration of 61.8 mg/kg, which is above the background value of 18.8 mg/kg.
- Seventeen samples contained elevated copper at concentrations ranging from 22.1 to 543 mg/kg, compared to a background limit of 17.1 mg/kg.
- Two samples contained mercury at concentrations of 0.0569 J and 0.258 mg/kg, which are above the background limit of 0.055 mg/kg.
- One sample contained lead at a concentration of 31.2 mg/kg, which is above the background limit of 18.9 mg/kg.
- One sample contained nickel at a concentration of 252 mg/kg, compared to a background limit of 16.6 mg/kg.
- Two samples contained silver at concentrations of 2.24 and 3.62 mg/kg, which are above the background value of less than 0.50 mg/kg.
- Three samples contained elevated zinc at concentrations ranging from 53.0 to 225 mg/kg, compared to a background limit of 52.1 mg/kg.

The results of the HE compound analysis are presented in Table 4.5.3.4-2. One sample contained 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene at concentrations of 20,000J, 450J, and 480J μg/kg, respectively. HMX was detected in four samples at levels up to 5,600J μg/kg. RDX was detected in one sample at a concentration of 270J μg/kg. The MDLs for all HE parameters analyzed are provided in Table 4.5.3.4-3.

The results of the gamma spectroscopy analysis are presented in Table 4.5.3.4-4. All cesium-137, thorium-232, and uranium-238 results were below background activity levels. The MDAs for uranium-235 analyses for 12 of the samples were above background activity; the MDAs ranged from 0.161 to 0.240 pCi/g. Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

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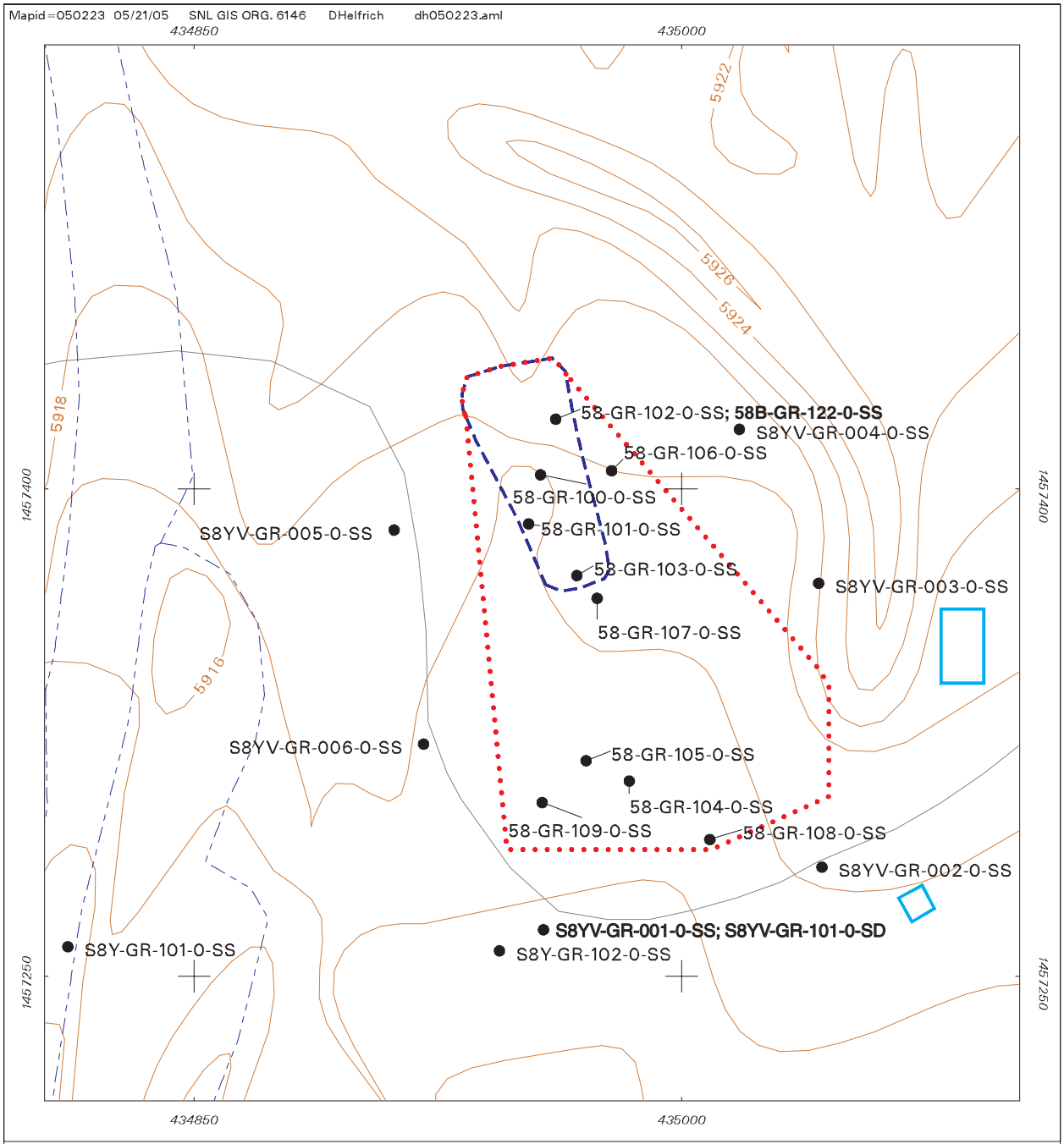

Legend

- Sample Location
- 2-Foot Contour
- Dirt Access Road
- Building
- Surface Drainage
- Pit Boundary
- Feature 8Y Boundary

Figure 4.5.3.3-1
Post-VCM Confirmatory Sample Locations at Features 8Y/58B

0 25 50
Scale in Feet

0 6 12
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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Table 4.5.3.4-1
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Soil Confirmatory Sampling
Metals and Total Uranium Analytical Results
September 1998 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010B, 6020, 908.1, and 7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium
601310	S8YV-GR-001-0-SS	Soil	01-19-99	0–0.5	2.40	103 J	0.359 J (0.481)	0.405 J (0.481)	16.3
601310	S8YV-GR-002-0-SS	Soil	01-19-99	0–0.5	2.06	82.6 J	0.334 J (0.485)	0.209 J (0.485)	12.5
601310	S8YV-GR-003-0-SS	Soil	01-19-99	0–0.5	2.34	121 J	0.422 J (0.500)	0.621	15.4
601310	S8YV-GR-004-0-SS	Soil	01-19-99	0–0.5	2.42	82.8 J	0.454 J (0.476)	0.164 J (0.476)	11.4
601310	S8YV-GR-005-0-SS	Soil	01-19-99	0–0.5	1.99	86.6 J	0.323 J (0.467)	0.318 J (0.467)	11.5
601310	S8YV-GR-006-0-SS	Soil	01-19-99	0–0.5	2.07	86.0 J	0.355 J (0.500)	0.334 J (0.500)	12.7
601310	S8YV-GR-101-0-SD[c]	Soil	01-19-99	0–0.5	1.72	147 J	0.312 J (0.463)	**1.12**	**61.8**
600853[d]/600854	58B-GR-100-0-SS	Soil	09-22-98	0–0.5	1.81	137	0.507	0.320 J (0.5)	9.20
600853[d]/600854	58B-GR-101-0-SS	Soil	09-22-98	0–0.5	2.20	133	0.426 J (0.5)	**0.952**	10.1
600853[d]/600854	58B-GR-102-0-SS	Soil	09-22-98	0–0.5	1.55	106	0.389 J (0.5)	0.567	13.9
600853[d]/600854	58B-GR-103-0-SS	Soil	09-22-98	0–0.5	1.82	154	0.335 J (0.5)	0.482 J (0.5)	11.5
600853[d]/600854	58B-GR-104-0-SS	Soil	09-22-98	0–0.5	1.34	92.5	0.334 J (0.5)	ND (0.275)	15.6
600853[d]/600854	58B-GR-105-0-SS	Soil	09-22-98	0–0.5	1.45	83.7	0.372 J (0.5)	ND (0.275)	17.8
600853[d]/600854	58B-GR-106-0-SS	Soil	09-22-98	0–0.5	1.24	90.8	0.347 J (0.5)	ND (0.275)	11.9
600853[d]/600854	58B-GR-107-0-SS	Soil	09-22-98	0–0.5	1.36	93.0	0.356 J (0.5)	ND (0.275)	13.9
600853[d]/600854	58B-GR-108-0-SS	Soil	09-22-98	0–0.5	1.59	101	0.410 J (0.5)	0.309 J (0.5)	12.6
600853[d]/600854	58B-GR-109-0-SS	Soil	09-22-98	0–0.5	1.12	75.0	0.364 J (0.5)	ND (0.275)	12.9
600853[d]/600854	58B-GR-122-0-SS[e]	Soil	09-22-98	0–0.5	1.62	112	0.439 J (0.5)	ND (0.275)	12.9
NMED-Approved Background Values—Canyon Area[f]		Soil	NA	NA	9.8	246	0.75	0.64	18.8
Quality Assurance Sample (mg/L)									
600854/600853	58B-GR-121-0-EB	Water	09-22-98	NA	ND (0.000827)	0.00108 J (0.01)	ND (0.00124)	ND (0.00275)	ND (0.00198)

Refer to footnotes at end of table.

Table 4.5.3.4-1 (Continued)
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Soil Confirmatory Sampling
Metals and Total Uranium Analytical Results
September 1998 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010B, 6020, 908.1, and 7471A[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Copper	Lead	Mercury	Nickel
601310	S8YV-GR-001-0-SS	Soil	01-19-99	0–0.5	**411**	**31.2**	0.0210 J (0.00287)	14.3
601310	S8YV-GR-002-0-SS	Soil	01-19-99	0–0.5	**27.6**	11.3	0.0136 J (0.0309)	12.0
601310	S8YV-GR-003-0-SS	Soil	01-19-99	0–0.5	**31.6**	17.5	0.0172 J (0.0292)	13.5
601310	S8YV-GR-004-0-SS	Soil	01-19-99	0–0.5	**22.2**	7.86	0.0140 J (0.0292)	11.0
601310	S8YV-GR-005-0-SS	Soil	01-19-99	0–0.5	**543**	11.2	0.0237 J (0.0291)	11.9
601310	S8YV-GR-006-0-SS	Soil	01-19-99	0–0.5	**31.6**	14.7	0.0247 J (0.0311)	11.3
601310	S8YV-GR-101-0-SD[c]	Soil	01-19-99	0–0.5	**30.0**	15.1	0.0127 J (0.0293)	**252**
600853[d]/600854	58B-GR-100-0-SS	Soil	09-22-98	0–0.5	16.5	9.99	0.0130 J (0.10)	9.80
600853[d]/600854	58B-GR-101-0-SS	Soil	09-22-98	0–0.5	**122**	0.456 J (1)	**0.0569 J (0.10)**	10.8
600853[d]/600854	58B-GR-102-0-SS	Soil	09-22-98	0–0.5	**43.9**	0.207 J (1)	0.0129 J (0.10)	12.0
600853[d]/600854	58B-GR-103-0-SS	Soil	09-22-98	0–0.5	**450**	0.822 J (4)	**0.258**	11.6
600853[d]/600854	58B-GR-104-0-SS	Soil	09-22-98	0–0.5	**24.0**	7.26	ND (0.0078)	13.4
600853[d]/600854	58B-GR-105-0-SS	Soil	09-22-98	0–0.5	**24.0**	6.88	0.0098 J (0.10)	14.5
600853[d]/600854	58B-GR-106-0-SS	Soil	09-22-98	0–0.5	**22.1**	9.69	0.0132 J (0.10)	11.6
600853[d]/600854	58B-GR-107-0-SS	Soil	09-22-98	0–0.5	**25.8**	9.85	0.0093 J (0.10)	11.6
600853[d]/600854	58B-GR-108-0-SS	Soil	09-22-98	0–0.5	**21.8**	0.0836 J (1)	0.0105 J (0.10)	11.2
600853[d]/600854	58B-GR-109-0-SS	Soil	09-22-98	0–0.5	**23.0**	0.0752 J (1)	0.0092 J (0.10)	14.6
600853[d]/600854	58B-GR-122-0-SS[e]	Soil	09-22-98	0–0.5	**38.7**	0.174 J (1)	0.0131 J (0.10)	13.0
NMED-Approved Background Values—Canyons Area[f]		Soil	NA	NA	17.1	18.9	0.055	16.6
Quality Assurance Samples (mg/L)								
600854/600853	58B-GR-121-0-EB	Water	09-22-98	NA	ND (0.00485)	0.00128 J (0.002)	ND (0.000047)	ND (0.0173)

Refer to footnotes at end of table.

Table 4.5.3.4-1 (Continued)
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Soil Confirmatory Sampling
Metals and Total Uranium Analytical Results
September 1998 and January 1999
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010B, 6020, 908.1, and 7471A[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Selenium	Silver	Total Uranium	Zinc
601310	S8YV-GR-001-0-SS	Soil	01-19-99	0–0.5	0.440 J (0.481)	0.382 J (0.481)	0.625 J	**53.0**
601310	S8YV-GR-002-0-SS	Soil	01-19-99	0–0.5	0.417 J (0.485)	ND (0.031)	0.477 J	41.6
601310	S8YV-GR-003-0-SS	Soil	01-19-99	0–0.5	ND (0.135)	0.115 J (0.500)	0.425 J	47.0
601310	S8YV-GR-004-0-SS	Soil	01-19-99	0–0.5	0.440 J (0.476)	ND (0.031)	0.493 J	43.5
601310	S8YV-GR-005-0-SS	Soil	01-19-99	0–0.5	0.443 J (0.467)	0.0743 J (0.467)	0.373 J	36.9
601310	S8YV-GR-006-0-SS	Soil	01-19-99	0–0.5	0.456 J (0.500)	ND (0.031)	0.439 J	48.2
601310	S8YV-GR-101-0-SD[c]	Soil	01-19-99	0–0.5	0.339 J (0.463)	0.179 J (0.463)	0.918 J	35.7
600853[d]/600854	58B-GR-100-0-SS	Soil	09-22-98	0–0.5	ND (0.0.0891)	ND (0.301)	2.2[d]	33.3
600853[d]/600854	58B-GR-101-0-SS	Soil	09-22-98	0–0.5	ND (0.0891)	**2.24**	2.3[d]	**122**
600853[d]/600854	58B-GR-102-0-SS	Soil	09-22-98	0–0.5	ND (0.0891)	ND (0.301)	2.0[d]	44.6
600853[d]/600854	58B-GR-103-0-SS	Soil	09-22-98	0–0.5	ND (0.0891)	**3.62**	2.3[d]	**225**
600853[d]/600854	58B-GR-104-0-SS	Soil	09-22-98	0–0.5	ND (0.0891)	ND (0.301)	1.9[d]	49.7
600853[d]/600854	58B-GR-105-0-SS	Soil	09-22-98	0–0.5	ND (0.0891)	ND (0.301)	1.2[d]	50.0
600853[d]/600854	58B-GR-106-0-SS	Soil	09-22-98	0–0.5	ND (0.0891)	ND (0.301)	1.3[d]	44.7
600853[d]/600854	58B-GR-107-0-SS	Soil	09-22-98	0–0.5	ND (0.0891)	ND (0.301)	2.2[d]	45.6
600853[d]/600854	58B-GR-108-0-SS	Soil	09-22-98	0–0.5	0.0980 J (0.5)	ND (0.301)	2.3[d]	44.5
600853[d]/600854	58B-GR-109-0-SS	Soil	09-22-98	0–0.5	ND (0.0891)	ND (0.301)	1.9[d]	45.2
600853[d]/600854	58B-GR-122-0-SS[e]	Soil	09-22-98	0–0.5	ND (0.0891)	ND (0.301)	2.3[d]	46.5
NMED-Approved Background Values—Canyons Area[f]		Soil	NA	NA	2.7	<0.50	3.42	52.1
Quality Assurance Samples (mg/L)								
600854/600853	58B-GR-121-0-EB	Water	09-22-98	NA	ND (0.000891)	ND (0.00301)	ND (1.0)[g]	0.0416 J (0.01)

Refer to footnotes at end of table.

Table 4.5.3.4-1 (Concluded)
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Soil Confirmatory Sampling
Metals and Total Uranium Analytical Results
September 1998 and January 1999
(Off-Site Laboratory)

Note: Values in **bold** exceed background soil concentrations or have MDLs that exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample S8YV-GR-101-0-SD is a duplicate of S8YV-GR-001-0-SS.
[d]Samples on Record Number 600853 were analyzed by EPA Method 908.1.
[e]Sample 58YV-GR-122-0-SS is a duplicate of 58B-GR-102-0-SS.
[f]Garcia November 1998.
58B = SWMU 58, Feature 58B.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
S8YV = SWMU 8, Feature 8Y Verification Sample.
SD = Soil sample duplicate.
SS = Soil Sample.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

Table 4.5.3.4-2
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Soil Confirmatory Sampling
HE Compound Analytical Results
September 1998 and January 1999
(Off-Site Laboratories)

Sample Attributes					HE (EPA Method 8330[a]) (μg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	HMX	RDX	2,4,6-Trinitrotoluene	2-Amino-4,6-dinitrotoluene	4-Amino-2,6-dinitrotoluene
601310	S8YV-GR-001-0-SS	Soil	01-19-99	0–0.5	**790**	ND (9.7)	ND (5.7)	ND (6.6)	ND (5.5)
601310	S8YV-GR-002-0-SS	Soil	01-19-99	0–0.5	**4,000**	ND (9.7)	ND (5.7)	ND (6.6)	ND (5.5)
601310	S8YV-GR-003-0-SS	Soil	01-19-99	0–0.5	**5,100**	ND (9.7)	ND (5.7)	ND (6.6)	ND (5.5)
601310	S8YV-GR-004-0-SS	Soil	01-19-99	0–0.5	ND (5.3)	ND (9.7)	ND (5.7)	ND (6.6)	ND (5.5)
601310	S8YV-GR-005-0-SS	Soil	01-19-99	0–0.5	ND (5.3)	ND (9.7)	ND (5.7)	ND (6.6)	ND (5.5)
601310	S8YV-GR-006-0-SS	Soil	01-19-99	0–0.5	ND (5.3)	ND (9.7)	ND (5.7)	ND (6.6)	ND (5.5)
601310	S8YV-GR-101-0-SD[c]	Soil	01-19-99	0–0.5	ND (5.3)	ND (9.7)	ND (5.7)	ND (6.6)	ND (5.5)
601332	S8Y-GR-101-0-SS[d]	Soil	01-25-99	0–0.5	ND (5.3 J)	ND (9.7 J)	ND (5.7 J)	ND (6.6 J)	ND (5.5 J)
601332	S8Y-GR-102-0-SS[d]	Soil	01-25-99	0–0.5	ND (5.3 J)	ND (9.7 J)	**20,000 J**	**450 J**	**480 J**
600854	58B-GR-100-0-SS	Soil	09-22-98	0–0.5	ND (0.17 J)	ND (0.22 J)	ND (0.21 J)	ND (0.26 J)	ND (0.30 J)
600854	58B-GR-101-0-SS	Soil	09-22-98	0–0.5	ND (0.17 J)	ND (0.22 J)	ND (0.21 J)	ND (0.26 J)	ND (0.30 J)
600854	58B-GR-102-0-SS	Soil	09-22-98	0–0.5	ND (0.16 J)	ND (0.21 J)	ND (0.19 J)	ND (0.24 J)	ND (0.29 J)
600854	58B-GR-103-0-SS	Soil	09-22-98	0–0.5	**5,600 J**	**270 J**	ND (0.21 J)	ND (0.27 J)	ND (0.31 J)
600854	58B-GR-104-0-SS	Soil	09-22-98	0–0.5	ND (0.17 J)	ND (0.21 J)	ND (0.20 J)	ND (0.25 J)	ND (0.29 J)
600854	58B-GR-105-0-SS	Soil	09-22-98	0–0.5	ND (0.17 J)	ND (0.21 J)	ND (0.20 J)	ND (0.25 J)	ND (0.29 J)
600854	58B-GR-106-0-SS	Soil	09-22-98	0–0.5	ND (0.16 J)	ND (0.21 J)	ND (0.19 J)	ND (0.25 J)	ND (0.29 J)
600854	58B-GR-107-0-SS	Soil	09-22-98	0–0.5	ND (0.16 J)	ND (0.20 J)	ND (0.19 J)	ND (0.24 J)	ND (0.28 J)
600854	58B-GR-108-0-SS	Soil	09-22-98	0–0.5	ND (0.17 J)	ND (0.21 J)	ND (0.20 J)	ND (0.25 J)	ND (0.29 J)
600854	58B-GR-109-0-SS	Soil	09-22-98	0–0.5	ND (0.18 J)	ND (0.23 J)	ND (0.21 J)	ND (0.27 J)	ND (0.31 J)
600854	58B-GR-122-0-SS[e]	Soil	09-22-98	0–0.5	ND (250 J)	ND (250 J)	ND (250 J)	ND (250 J)	ND (250 J)
Quality Assurance Sample (μg/L)									
600854	58B-GR-121-0-EB	Water	09-22-98	NA	ND (0.5 J)	ND (0.5 J)	ND (0.5 J)	ND (0.5 J)	ND (0.5 J)

Refer to footnotes at end of table.

Table 4.5.3.4-2 (Concluded)
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Soil Confirmatory Sampling
HE Compound Analytical Results
September 1998 and January 1999
(Off-Site Laboratories)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample S8YV-GR-101-0-SD is a duplicate of S8YV-GR-001-0-SS
[d]Two additional samples collected for HE analysis.
[e]Sample 58B-GR-122-0-SS is a duplicate of 58B-GR-102-0-SS.
58B = SWMU 58, Feature 58B.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
S8YV = SWMU 8, Feature 8Y Verification Sample.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
VCM = Voluntary corrective measure.

Table 4.5.3.4-3
Summary of HE Compound Analytical MDLs for
SWMUs 8 and 58, Features 8Y and 58B VCM Confirmatory Soil Sampling
September 1998 and January 1999
(Off-Site Laboratory)

Analyte	MDL[a] (EPA Method 8330[b]) (μg/kg)
m-Dinitrobenzene	4.1 (0.18–250)
2,4-Dinitrotoluene	6.2 (0.17–250)
2,6-Dinitrotoluene	6.5 (0.22–250)
2-amino-4,6-Dinitrotoluene	6.6 (0.24–250)
4-amino-2,6-Dinitrotoluene	5.5 (0.28–250)
HMX	5.3 (0.16–250)
Nitrobenzene	5.2 (0.20–250)
m-Nitrotoluene	11 (0.66–250)
o-Nitrotoluene	7.8 (0.28–250)
p-Nitrotoluene	11 (0.32–250)
RDX	9.7 (0.20–250)
Tetryl	7.5 J (0.30–250)
sym-Trinitrobenzene	6.6 (0.54–250)
2,4,6-Trinitrotoluene	5.7 (0.19–250)

[a]MDLs for the 09-22-98 sampling event are in parentheses.
[b]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
Tetryl = Methyl-2,4,6-trinitrophenylnitramine.
VCM = Voluntary Corrective Measure.

Table 4.5.3.4-4
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Confirmatory Soil Sampling
Gamma Spectroscopy Analytical Results
September 1998 and January 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
601311	S8YV-GR-001-0-SS	Soil	01-19-99	0–0.5	0.276	0.286	0.637	0.379
601311	S8YV-GR-002-0-SS	Soil	01-19-99	0–0.5	0.111	0.0424	0.712	0.396
601311	S8YV-GR-003-0-SS	Soil	01-19-99	0–0.5	0.414	0.0785	0.899	0.402
601311	S8YV-GR-004-0-SS	Soil	01-19-99	0–0.5	0.0254	0.0201	0.745	0.384
601311	S8YV-GR-005-0-SS	Soil	01-19-99	0–0.5	0.192	0.0463	0.657	0.351
601311	S8YV-GR-006-0-SS	Soil	01-19-99	0–0.5	0.337	0.0747	0.863	0.462
601311	S8YV-GR-101-0-SD[d]	Soil	01-19-99	0–0.5	0.0120	0.0163	0.813	0.425
601334	S8Y-GR-101-0-SS[e]	Soil	01-25-99	0–0.5	0.0455	0.0306	0.577	0.321
601334	S8Y-GR-102-0-SS[e]	Soil	01-25-99	0–0.5	0.235	0.0411	0.581	0.268
600855	58B-GR-100-0-SS	Soil	09-22-98	0–0.5	ND (0.0327)	--	0.944	0.453
600857	58B-GR-101-0-SS	Soil	09-22-98	0–0.5	ND (0.0360)	--	0.846	0.444
600857	58B-GR-102-0-SS	Soil	09-22-98	0–0.5	0.0185	0.0322	0.726	3.96-001
600857	58B-GR-103-0-SS	Soil	09-22-98	0–0.5	0.0317	0.0343	0.733	0.390
600855	58B-GR-104-0-SS	Soil	09-22-98	0–0.5	ND (0.0312)	--	0.662	0.347
600857	58B-GR-105-0-SS	Soil	09-22-98	0–0.5	ND (0.0326)	--	0.641	0.368
600857	58B-GR-106-0-SS	Soil	09-22-98	0–0.5	0.0745	0.0364	0.612	0.336
600857	58B-GR-107-0-SS	Soil	09-22-98	0–0.5	ND (0.0299)	--	0.622	0.352
600857	58B-GR-108-0-SS	Soil	09-22-98	0–0.5	ND (0.0350)	--	0.700	0.385
600855	58B-GR-109-0-SS	Soil	09-22-98	0–0.5	ND (0.0286)	--	ND (0.117)	--
Background Activity—Lower Canyons Area[f]		Soil	NA	NA	1.55	NA	1.03	NA
Quality Assurance/Quality Control Sample (pCi/L)								
600857	58B-GR-121-0-EB	Water	09-22-98	NA	ND (0.0147)	NA	ND (0.114)	NA

Refer to footnotes at end of table.

Table 4.5.3.4-4 (Continued)
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Confirmatory Soil Sampling
Gamma Spectroscopy Analytical Results
September 1998 and January 1999
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
601311	S8YV-GR-001-0-SS	Soil	01-19-99	0–0.5	**ND (0.184)**	--	ND (0.452)	--
601311	S8YV-GR-002-0-SS	Soil	01-19-99	0–0.5	**ND (0.177)**	--	0.251	0.306
601311	S8YV-GR-003-0-SS	Soil	01-19-99	0–0.5	**ND (0.223)**	--	ND (0.748)	--
601311	S8YV-GR-004-0-SS	Soil	01-19-99	0–0.5	**ND (0.188)**	--	ND (0.647)	--
601311	S8YV-GR-005-0-SS	Soil	01-19-99	0–0.5	**ND (0.184)**	--	ND (0.605)	--
601311	S8YV-GR-006-0-SS	Soil	01-19-99	0–0.5	**ND (0.240)**	--	ND (0.816)	--
601311	S8YV-GR-101-0-SD[d]	Soil	01-19-99	0–0.5	**ND (0.193)**	--	ND (0.669)	--
601334	S8Y-GR-101-0-SS[e]	Soil	01-25-99	0–0.5	**ND (0.161)**	--	ND (0.440)	--
601334	S8Y-GR-102-0-SS[e]	Soil	01-25-99	0–0.5	0.143	0.144	ND (0.479)	--
600855	58B-GR-100-0-SS	Soil	09-22-98	0–0.5	0.103	0.205	0.499	0.378
600857	58B-GR-101-0-SS	Soil	09-22-98	0–0.5	0.133	0.168	ND (0.507)	--
600857	58B-GR-102-0-SS	Soil	09-22-98	0–0.5	0.0246	0.153	ND (0.471)	--
600857	58B-GR-103-0-SS	Soil	09-22-98	0–0.5	0.0265	0.157	ND (0.459)	--
600855	58B-GR-104-0-SS	Soil	09-22-98	0–0.5	**ND (0.214)**	--	ND (0.714)	--
600857	58B-GR-105-0-SS	Soil	09-22-98	0–0.5	0.0383	0.162	ND (0.490)	--
600857	58B-GR-106-0-SS	Soil	09-22-98	0–0.5	**ND (0.170)**	--	0.410	0.763
600857	58B-GR-107-0-SS	Soil	09-22-98	0–0.5	0.0799	0.153	0.420	0.325
600857	58B-GR-108-0-SS	Soil	09-22-98	0–0.5	**ND (0.188)**	--	ND (0.491)	--
600855	58B-GR-109-0-SS	Soil	09-22-98	0–0.5	**ND (0.196)**	--	0.795	0.404
Background Activity—Lower Canyons Area[f]		Soil	NA	NA	0.16	NA	2.31	NA
Quality Assurance/Quality Control Sample (pCi/L)								
600857	58B-GR-121-0-EB	Water	09-22-98	NA	ND (0.105)	NA	ND (0.263)	NA

Refer to footnotes at end of table.

Table 4.5.3.4-4 (Concluded)
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Confirmatory Soil Sampling
Gamma Spectroscopy Analytical Results
September 1998 and January 1999
(On-Site Laboratory)

[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Sample S8YV-GR-101-0-SD is a duplicate of S8YV-GR-001-0-SS.
[e]Two additional samples were collected for gamma spectroscopy analysis.
[f]Dinwiddie September 1997.

58B = SWMU 58, Feature 58B.
EB = Equipment blank.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/L = Picocurie(s) per liter.
S8YV = SWMU 8, Feature 8Y Verification Sample.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
VCM = Voluntary corrective measure.
-- = Error not calculated for nondetect results.

The results of the tritium analysis are presented in Table 4.5.3.4-5. All results are below the background activity level of 420 pCi/L.

4.5.3.5 Data Quality Results for SWMUs 8Y and 58B (Debris Pile and Pit)

QA/QC field samples collected as part of the VCM confirmatory soil sampling included one EB and two duplicate samples. The EB sample was analyzed off site for metals, HE compounds, and tritium, and on site for radionuclides. Metal concentrations were slightly greater than the MDLs for barium, lead, and zinc; the concentrations of barium, lead, and zinc were below the PQL, and the results were qualified as J (estimated) values. No HE compounds were detected in the EB samples.

RPDs were calculated for the primary and duplicate metal samples analyzed by GEL and CORE Laboratory (Table 4.5.3.5-1). The metal confirmatory sample sets for soil samples collected within the VCM area (Samples 58B-GR-102-0-SS and 58B-GR-122-0-SS) were within the RPD limits for all metals. The results for the unremediated soil (Samples 58YV-GR-001-0-SS and 58YV-GR-001-0-SD) outside the VCM area, sampled in January 1999, show analytical results with RPDs typical of the heterogeneous soil.

Data Validation Results for SWMUs 8Y and 58B (Debris Pile and Pit)

The off-site laboratory results from GEL and CORE Laboratory were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

No soil sample analytical data for AR/COC 600853 required qualification during validation. HMX and RDX results were qualified as estimated values in AR/COC 600854 for Sample 58B-GR-103-0-SS. The MDLs for all HE compounds in AR/COC 600854 were qualified as estimated values. In AR/COC 601310, all tritium, and barium results were qualified as estimated values. Silver results were qualified as estimated values in four samples in AR/COC 601310.

4.5.3.6 Data Gaps for SWMUs 8Y and 58B (Debris Pile and Pit)

No data gaps remained in the characterization of SWMUs 8Y and 58B upon the completion of the VCM.

Table 4.5.3.4-5
Summary of SWMUs 8 and 58, Features 8Y and 58B VCM Confirmatory Soil Sampling
Tritium Analytical Results
September 1998 and January 1999
(Off-Site Laboratories)

Sample Attributes					Tritium (EPA Method 906.0[a]) (pCi/L[b])	
Record Number[c]	ER Sample ID[d]	Sample Matrix	Sample Date	Sample Depth (ft)	Tritium	Accuracy +/-
601310	S8YV-GR-001-0-SS	Soil	01-19-99	0–0.5	196 J	155
601310	S8YV-GR-002-0-SS	Soil	01-19-99	0–0.5	213 J	156
601310	S8YV-GR-003-0-SS	Soil	01-19-99	0–0.5	176 J	155
601310	S8YV-GR-004-0-SS	Soil	01-19-99	0–0.5	336 J	176
601310	S8YV-GR-005-0-SS	Soil	01-19-99	0–0.5	141 J	150
601310	S8YV-GR-006-0-SS	Soil	01-19-99	0–0.5	ND (128 J)	151
601310	S8YV-GR-101-0-SD	Soil	01-19-99	0–0.5	ND (126 J)	152
600853	58B-GR-100-0-SS[e]	Soil	09-22-98	0–0.5	266	208
600853	58B-GR-104-0-SS	Soil	09-22-98	0–0.5	225	179
600853	58B-GR-105-0-SS	Soil	09-22-98	0–0.5	131	176
600853	58B-GR-107-0-SS	Soil	09-22-98	0–0.5	162	172
600853	58B-GR-108-0-SS	Soil	09-22-98	0–0.5	81.1	170
Background Activity[f]		Soil	NA	NA	420	NA
Quality Assurance Sample						
042940-003	58-GR-121-0-EB[g]	Water	09-22-98	NA	248	169

[a]EPA November 1986.
[b]420 pCi/L = 0.021 pCi/g.
[c]Analysis request/chain-of-custody record.
[d]Only samples with adequate moisture to conduct tritium analysis are shown.
[e]Sample S8YV-GR-101-0-SD is a duplicate of S8YV-GR-001-0-SS.
[f]Tharp February 1999.
[g]This sample was incorrectly labeled as a soil sample in the analysis request/chain of custody and is corrected on this table.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/L = Picocurie(s) per liter.
S8YV = SWMU 8, Feature 8Y Verification Sample.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
VCM = Voluntary corrective measure.

Table 4.5.3.5-1
Summary of SWMUs 8 and 58, Features 8Y and 58B Field Duplicate Relative Percent Difference Values
September 1998 and January 1999
(Off-Site Laboratories)

Sample Attributes			Metals Relative Percent Difference						
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead
601310	S8YV-GR-001-0-SS S8YV-GR-101-0-SD	0–0.5	33.01	35.2	14.01	93.77	116.52	172.79	69.55
600854	58B-GR-102-0-SS 58B-GR-122-0-SS	0–0.5	4.42	5.5	12.08	NA	7.46	12.59	17.32

Sample Attributes			Metals Relative Percent Difference					
Record Number[a]	ER Sample ID	Sample Depth (ft)	Mercury	Nickel	Selenium	Silver	Uranium	Zinc
601310	S8YV-GR-001-0-SS S8YV-GR-001-0-SD	0–0.5	49.26	178.52	25.93	72.37	37.98	39.01
600854	58B-GR-102-0-SS 58B-GR-122-0-SS	0–0.5	1.54	8.0	NA	NA	14.0	4.2

[a]Analysis request/chain-of-custody record.
58B = SWMU 58, Feature 58B.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not analyzed.
S8YV = SWMU 8, Feature Y Verification Sample.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

4.5.3.7 Results and Conclusions for SWMUs 8Y and 58B (Debris Pile and Pit)

The VCM characterized and removed the debris on the surface and in the shallow subsurface. The SWMU 58B pit was then filled with clean soil. The VCM area was recontoured to prevent erosion, then seeded and covered with a vegetative mat. Confirmatory sampling demonstrated that elevated levels of metals and HE compounds remained in the soil at some locations after the VCM, but no tritium was found. All COCs are included in the site-specific risk assessment for the site. The VCM adequately characterized the area and addressed surface-water regulation requirements by removing potential sources of COCs from the drainage pattern and revegetating disturbed areas.

4.5.4 SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF VCA Activities (UCS)

4.5.4.1 Nonsampling Data Collection

In January 1994, RUST Geotech Inc. conducted a surface gamma radiation survey with 100-percent coverage over the area of the SWMU 58 UCS. Several fragments, which consisted of thorium-containing metal, were removed. In October 1998, Environmental Restoration Group, Inc. conducted a surface radiation survey with 100-percent coverage over an area of approximately 2 acres that encompassed the UCS. The entire area was field-counted during this survey. SNL/NM RP personnel performed another radiation survey over the area encompassing the UCS on August 23, 2000. Results from these surveys did not identify any elevated radioactivity above background (10,100 cpm).

4.5.4.2 VCA Activities at SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

In accordance with the SNL/NM VCA Plan, "Voluntary Corrective Action Plan for Excavation and Removal of the Underground Conduit System at Environmental Restoration SWMU 58," (SNL/NM October 2000), VCA activities were conducted at the UCS during October and November 2000. The VCA involved: 1) excavation and removal of five manholes and associated piping, wire, and electrical components; 2) collection of confirmatory soil samples from beneath the system; and 3) disposal of the manholes, piping, and associated debris. The materials removed during the VCA included steel, galvanized metals, plastic, and asbestos piping (ACM); copper, aluminum, and steel wiring and cable; electrical boxes; concrete; wood; and plastic sheeting.

The VCA excavation and removal activities started at the north end of the UCS and progressed southward. A track-hoe and front-end loader were used to excavate and remove the materials. Excavation continued until no conduit or associated construction debris was observed. During the excavation activities, visual inspection and field instrumentation surveys (organic vapor and radiation) were conducted to assess any soil staining or other evidence of potential contamination. No contamination was observed.

The next phase of the VCA involved the segregation and disposal of the conduit and associated debris. The debris and ACM were segregated and staged in separate piles. Once surveyed as clean or nonradioactive, the larger objects (e.g., concrete manholes, piping, rebar, steel plates,

etc.) were recycled. Upon completion of the VCA excavation activities, the entire area was recontoured.

4.5.4.3 Sampling Activities at SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

Post-VCA confirmatory soil samples were collected at the UCS in October 2000 to verify the absence of COCs and confirm that the VCA activities were complete. Specifically, five samples and one duplicate sample were collected along the entire length of the UCS, at approximate 250-foot intervals. The sample locations are shown in Figure 4.5.4.3-1. In addition, one sample was collected from directly beneath each of the five manholes removed (Figure 4.5.4.3-1). The samples were analyzed for metals, VOCs, and radionuclides by gamma spectroscopy. The analytical results are presented in Tables 4.5.4.3-1, 4.5.4.3-2, and 4.5.4.3-3.

4.5.4.4 Sampling Results for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

Except for the following results, all metal concentrations for the confirmatory samples collected were below background levels.

- Barium was detected in five samples at concentrations ranging from 251 to 367 mg/kg, compared to the background limit of 246 mg/kg.
- Elevated cadmium was detected in four samples at concentrations ranging from 0.658 to 1.16 mg/kg, compared to the background limit of 0.64 mg/kg.
- Lead was detected in three samples at concentrations ranging from 23.2 J to 40.9 mg/kg, compared to the background limit of 18.9 mg/kg.

With the exception of ethylbenzene, no VOCs were detected in any of the confirmatory samples collected. Ethylbenzene was detected in one sample at a concentration of 0.266 J μg/kg.

All ten confirmatory samples contained cesium-137 and uranium-238 activity levels below the corresponding background activity limits. One sample exhibited an elevated thorium-232 activity of 1.23 pCi/g, compared to a background activity of 1.03 pCi/g. One sample contained an elevated uranium-235 activity of 0.255 pCi/g, compared to a background activity value of 0.160 pCi/g, and seven additional sample results had uranium-235 MDAs ranging from 0.166 to 0.222 pCi/g, above background concentrations. Annex C provides the gamma spectroscopy results for all samples collected at SWMU 58.

4.5.4.5 Data Quality Results for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

QA/QC samples were also collected from the UCS as part of the post-VCA confirmatory soil sampling. These included seven EB, FB, and TB sample sets, and one duplicate soil sample set. The duplicate sample set was analyzed off site for metals and VOCs.

The EB samples were analyzed off site for metals and VOCs. Barium, nickel, and selenium were detected in the blank samples, and the results were qualified as J (estimated) values. Acetone was detected in one blank sample at a concentration of 7.13 μg/liter (L), while the

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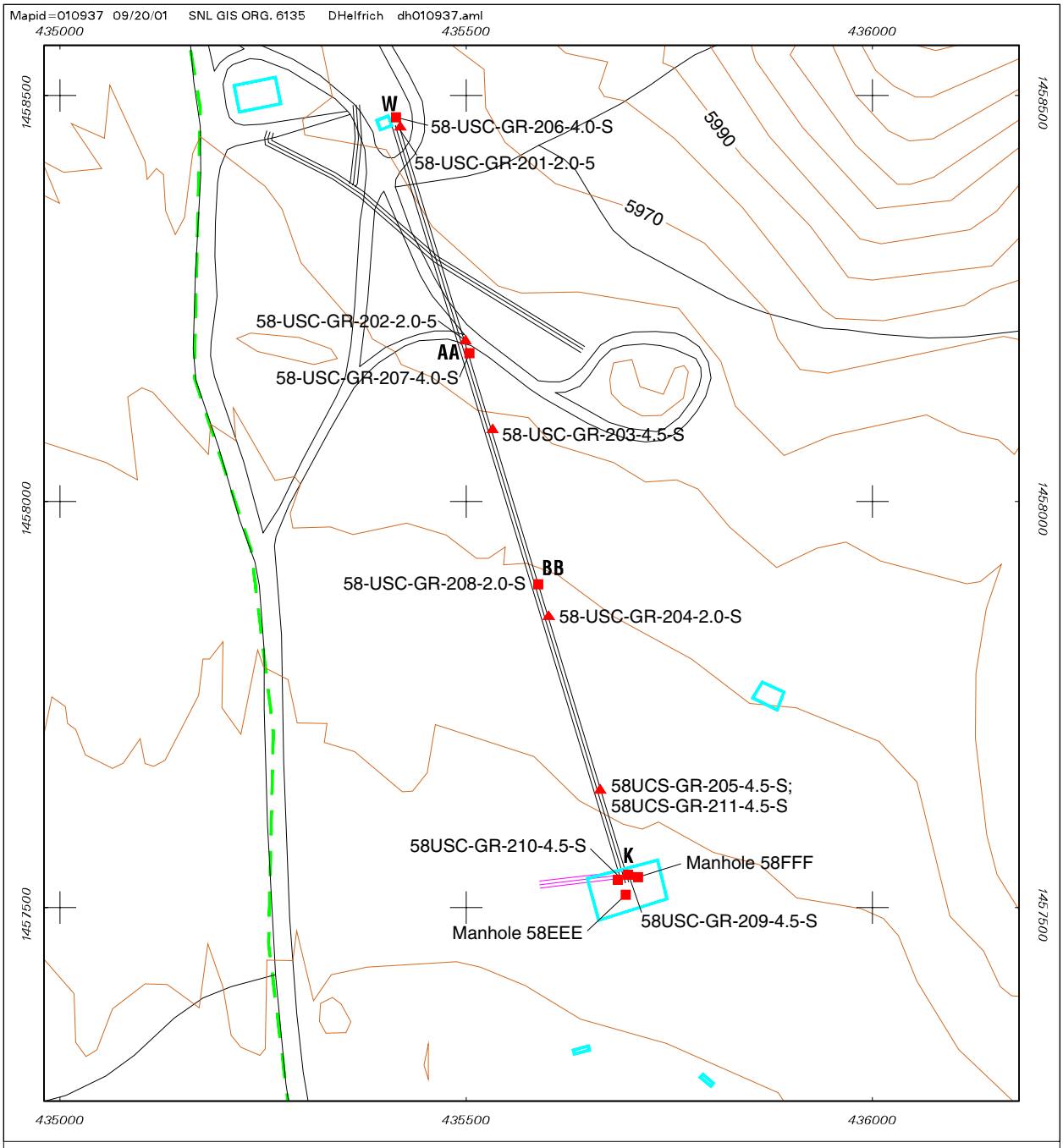

Legend

- Soil sample location
- Manhole sample location
- Road
- 10-Foot Contour
- SWMU 8/58 Boundary
- Conduit removed
- Asbestos piping removed
- Building / Structure

Figure 4.5.4.3-1
Confirmatory soil sample locations at the SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF, (Underground Conduit System)

0 100 200
Scale in Feet

0 24 48
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A49

Table 4.5.4.3-1
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
VCA Confirmatory Soil Sampling
Metals Analytical Results
October 2000
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010B and 7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium
603798	58UCS-GR-201-2.0-S	Soil	10-11-00	2.0–2.5	3.48	**307**	0.508	**0.869**	10.4
603800	58UCS-GR-202-2.0-S	Soil	10-17-00	2.0–2.5	3.94	155	0.512	0.578	11.1
603802	58UCS-GR-203-4.5-S	Soil	10-18-00	4.5–5.0	4.00	148	0.476 J (0.487)	0.637	11.5
603806	58UCS-GR-204-4.5-S	Soil	10-25-00	4.5–5.0	3.59	165	0.501	0.270 J (0.500)	8.16
603808	58UCS-GR-205-4.5-S	Soil	10-27-00	4.5–5.0	5.24	**258**	0.648	0.460 J (0.472)	11.6
603798	58UCS-GR-206-4.0-S	Soil	10-11-00	4.0–4.5	4.06	167	0.422 J (0.455)	**1.16**	9.58
603800	58UCS-GR-207-4.0-S	Soil	10-17-00	4.0–4.5	3.70	96.4	0.405 J (0.473)	**0.695**	10.3
603804	58UCS-GR-208-4.5-S	Soil	10-20-00	4.5–5.0	4.57	159	0.527	**0.658**	11.0
603810	58UCS-GR-209-4.5-S	Soil	10-31-00	4.5–5.0	3.96	**251**	0.522	0.299 J (0.481)	9.69
603810	58UCS-GR-210-4.5-S	Soil	10-31-00	4.5–5.0	4.43	**321**	0.485 J (0.495)	0.224 J (0.495)	9.14
603808	58UCS-GR-211-4.5-S[c]	Soil	10-27-00	4.5–5.0	5.93	**367**	0.712	0.427 J (0.481)	12.2
NMED-Approved Background Soil Concentrations—Canyon Area[d]		Soil	NA	NA	9.8	246	0.75	0.64	18.8
Quality Assurance Samples (mg/L)									
603798	58UCS-GR-225-0-EB	Water	10-11-00	NA	ND (0.00257)	0.00118 J (0.005)	ND (0.000474)	ND (0.000631)	ND (0.00106)
603800	58UCS-GR-226-0-EB	Water	10-17-00	NA	ND (0.00257)	ND (0.000748)	ND (0.000474)	ND (0.000631)	ND (0.00106)
603802	58UCS-GR-227-0-EB	Water	10-18-00	NA	ND (0.00257)	ND (0.000748)	ND (0.000474)	ND (0.000631)	ND (0.00106)
603804	58UCS-GR-228-0-EB	Water	10-20-00	NA	ND (0.00257)	ND (0.000748)	ND (0.000474)	ND (0.000631)	ND (0.00106)
603806	58UCS-GR-229-0-EB	Water	10-25-00	NA	ND (0.00257 J)	ND (0.000748)	ND (0.000474)	ND (0.000631)	ND (0.00106 J)
603808	58UCS-GR-230-0-EB	Water	10-27-00	NA	ND (0.00257)	0.000797 J (0.005)	ND (0.000474)	ND (0.000631)	ND (0.00106)
603810	58UCS-GR-231-0-EB	Water	10-31-00	NA	ND (0.00257)	0.000921 J (0.005)	ND (0.000474)	ND (0.000631)	ND (0.00106)

Refer to footnotes at end of table.

Table 4.5.4.3-1 (Continued)
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
VCA Confirmatory Soil Sampling
Metals Analytical Results
October 2000
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010B and 7471A[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver
603798	58UCS-GR-201-2.0-S	Soil	10-11-00	2.0–2.5	**23.2 J**	0.0151	10.2	ND (0.146)	ND (0.101)
603800	58UCS-GR-202-2.0-S	Soil	10-17-00	2.0–2.5	7.67	0.00923 J	10.3	ND (0.146)	ND (0.101)
603802	58UCS-GR-203-4.5-S	Soil	10-18-00	4.5–5.0	11.0	0.0117	10.9	ND (0.146)	ND (0.101)
603806	58UCS-GR-204-4.5-S	Soil	10-25-00	4.5–5.0	7	0.014	9.17	0.397 J (0.500)	ND (0.101)
603808	58UCS-GR-205-4.5-S	Soil	10-27-00	4.5–5.0	10.4	0.0261	13.1	0.440 J (0.146)	ND (0.101)
603798	58UCS-GR-206-4.0-S	Soil	10-11-00	4.0–4.5	**27.9 J**	0.0113	9.46	ND (0.146)	0.47
603800	58UCS-GR-207-4.0-S	Soil	10-17-00	4.0–4.5	**40.9**	0.00608 J (0.00971)	13.3	ND (0.146)	ND (0.101)
603804	58UCS-GR-208-4.5-S	Soil	10-20-00	4.5–5.0	12.9	0.0137 J	14.1	0.772	ND (0.101)
603810	58UCS-GR-209-4.5-S	Soil	10-31-00	4.5–5.0	9.73	0.0276 J	9.32	0.744	ND (0.101)
603810	58UCS-GR-210-4.5-S	Soil	10-31-00	4.5–5.0	7.04	0.0131 J	9.74	0.646	ND (0.101)
603808	58UCS-GR-211-4.5-S[c]	Soil	10-27-00	4.5–5.0	11.0	0.0346	12.5	0.505 J	ND (0.101)
NMED-Approved Background Soil Concentrations—Canyons Area[d]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5
Quality Assurance Samples (mg/L)									
603798	58UCS-GR-225-0-EB	Water	10-11-00	NA	ND (0.00183)	ND (0.00006 J)	0.00322 J (0.005)	ND (0.00236)	ND (0.000529)
603800	58UCS-GR-226-0-EB	Water	10-17-00	NA	ND (0.00183)	ND (0.00006)	ND (0.00309)	ND (0.00236)	ND (0.000529)
603802	58UCS-GR-227-0-EB	Water	10-18-00	NA	ND (0.00183)	ND (0.00006)	ND (0.00309)	ND (0.00236)	ND (0.000529)
603804	58UCS-GR-228-0-EB	Water	10-20-00	NA	ND (0.00183)	ND (0.00006 J)	ND (0.00309)	ND (0.00236)	ND (0.000529)
603806	58UCS-GR-229-0-EB	Water	10-25-00	NA	ND (0.00183)	ND (0.00006)	ND (0.00309)	ND (0.00236)	ND (0.000529 J)
603808	58UCS-GR-230-0-EB	Water	10-27-00	NA	ND (0.00183)	ND (0.00006)	ND (0.00309)	0.0028 J (0.005)	ND (0.000529)
603810	58UCS-GR-231-0-EB	Water	10-31-00	NA	ND (0.00183)	ND (0.00006)	ND (0.00309)	ND (0.00236)	ND (0.000529)

Refer to footnotes at end of table.

Table 4.5.4.3-1 (Concluded)
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
VCA Confirmatory Soil Sampling
Metals Analytical Results
October 2000
(Off-Site Laboratory)

Note: Values in **bold** exceed background soil concentrations or have MDLs that exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample 58UCS-GR-211-4.5-S is a duplicate of 58UCS-GR-205-4.5-S.
[d]Garcia November 1998.

58UCS	= SWMU 58, Underground Conduit System.
EB	= Equipment blank.
EPA	= U.S. Environmental Protection Agency.
ER	= Environmental Restoration.
ft	= Foot (feet).
GR	= Grab sample.
ID	= Identification.
J	= Estimated concentration.
J ( )	= The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL	= Method detection limit.
mg/kg	= Milligram(s) per kilogram.
mg/L	= Milligram(s) per liter.
NA	= Not applicable.
ND ( )	= Not detected above the MDL, shown in parentheses.
NMED	= New Mexico Environment Department.
S	= Subsurface soil sample.
SWMU	= Solid Waste Management Unit.
VCA	= Voluntary Corrective Action.

Table 4.5.4.3-2
Summary SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) VCA Confirmatory Soil Sampling
VOC Analytical Results
October 2000
(Off-Site Laboratory)

Sample Attributes					VOC (EPA Method 8240[a]) (μg/kg)
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Ethylbenzene
603798	58UCS-GR-201-2.0-S	Soil	10-11-00	2.0–2.5	ND (0.212)
603798	58UCS-GR-206-4.0-S	Soil	10-11-00	4.0–4.5	ND (0.212)
603800	58UCS-GR-202-2.0-S	Soil	10-17-00	2.0–2.5	ND (0.212)
603800	58UCS-GR-207-4.0-S	Soil	10-17-00	4.0–4.5	ND (0.212)
603802	58UCS-GR-203-4.5-S	Soil	10-18-00	4.5–5.0	ND (0.212)
603804	58UCS-GR-208-4.5-S	Soil	10-20-00	4.5–5.0	**0.266 J (1.00)**
603806	58UCS-GR-204-4.5-S	Soil	10-25-00	4.5–5.0	ND (0.212)
603808	58UCS-GR-205-4.5-S	Soil	10-27-00	4.5–5.0	ND (0.212)
603810	58UCS-GR-209-4.5-S	Soil	10-31-00	4.5–5.0	ND (0.212)
603810	58UCS-GR-210-4.5-S	Soil	10-31-00	4.5–5.0	ND (0.212)
603808	58UCS-GR-211-4.5-S[c]	Soil	10-27-00	4.5–5.0	ND (0.212)
Quality Assurance/Quality Control Samples (μg/L)					
603798	58UCS-GR-218-0-TB	NA	10-11-00	NA	ND (0.051)
603798	58UCS-GR-225-0-EB	NA	10-11-00	NA	ND (0.051)
603798	58UCS-GR-232-0-FB	NA	10-11-00	NA	ND (0.051)
603800	58UCS-GR-219-0-TB	NA	10-17-00	NA	ND (0.051)
603800	58UCS-GR-226-0-EB	NA	10-17-00	NA	ND (0.051)
603800	58UCS-GR-233-0-FB	NA	10-17-00	NA	ND (0.051)
603802	58UCS-GR-220-0-TB	NA	10-18-00	NA	ND (0.051)
603802	58UCS-GR-227-0-EB	NA	10-18-00	NA	ND (0.051)
603802	58UCS-GR-234-0-FB	NA	10-18-00	NA	ND (0.051)
603804	58UCS-GR-221-0-TB	NA	10-20-00	NA	ND (0.051)
603804	58UCS-GR-228-0-EB	NA	10-20-00	NA	ND (0.051)
603804	58UCS-GR-235-0-FB	NA	10-20-00	NA	ND (0.051)
603806	58UCS-GR-222-0-TB	NA	10-25-00	NA	ND (0.051)
603806	58UCS-GR-229-0-EB	NA	10-25-00	NA	ND (0.051)
603806	58UCS-GR-236-0-FB	NA	10-25-00	NA	ND (0.051)
603808	58UCS-GR-223-0-TB	NA	10-27-00	NA	ND (0.051)
603808	58UCS-GR-230-0-EB	NA	10-27-00	NA	ND (0.051)
603808	58UCS-GR-237-0-FB	NA	10-27-00	NA	ND (0.051)
603810	58UCS-GR-224-0-TB	NA	10-31-00	NA	ND (0.051)
603810	58UCS-GR-231-0-EB	NA	10-31-00	NA	ND (0.051)
603810	58UCS-GR-238-0-FB	NA	10-31-00	NA	ND (0.051)

Refer to footnotes at end of table.

Table 4.5.4.3-2 (Concluded)
Summary SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System) VCA Confirmatory Soil Sampling
VOC Analytical Results
October 2000
(Off-Site Laboratory)

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample 58UCS-GR-211-4.5-S is a duplicate of 58UCS-GR-205-4.5-S.
58UCS = SWMU 58, Underground Conduit System.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Subsurface soil sample.
SWMU = Solid Waste Management Unit.
TB = Trip blank.
VCA = Voluntary Corrective Action.
VOC = Volatile organic compound.

Table 4.5.4.3-3
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
VCA Confirmatory Soil Sampling
Gamma Spectroscopy Analytical Results
October 2000
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Cesium-137		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
603799	58UCS-GR-201-2.0-S	Soil	10-11-00	2.0–2.5	0.0170	0.0166	0.680	0.596
603799	58UCS-GR-206-4.0-S	Soil	10-11-00	4.0–4.5	0.0376	0.0186	0.652	0.303
603801	58UCS-GR-202-2.0-S	Soil	10-17-00	2.0–2.5	ND (0.0293)	--	0.896	0.414
603801	58UCS-GR-207-4.0-S	Soil	10-17-00	4.0–4.5	0.165	0.0311	**1.23**	0.567
603803	58UCS-GR-203-4.5-S	Soil	10-18-00	4.5–5.0	ND (0.0358)	--	0.770	0.371
603805	58UCS-GR-208-2.0-S	Soil	10-20-00	2.0–2.5	ND (0.0341)	--	0.890	0.420
603807	58UCS-GR-204-4.0-S	Soil	10-25-00	4.5–5.0	ND (0.0371)	--	0.922	0.429
603809	58UCS-GR-205-4.5-S	Soil	10-27-00	4.5–5.0	ND (0.0342)	--	0.833	0.393
603811	58UCS-GR-209-4.5-S	Soil	10-31-00	4.5–5.0	0.0384	0.0176	0.449	0.235
603811	58UCS-GR-210-4.5-S	Soil	10-31-00	4.5–5.0	0.0300	0.0135	0.591	0.278
Background Soil Activities—Lower Canyons Area[d]		NA	NA	NA	1.55	NA	1.03	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Uranium-238	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[d]	Result	Error[c]
603799	58UCS-GR-201-2.0-S	Soil	10-11-00	2.0–2.5	0.740	0.117	ND (0.421)	--
603799	58UCS-GR-206-4.0-S	Soil	10-11-00	4.0–4.5	ND (0.149)	--	0.588	0.550
603801	58UCS-GR-202-2.0-S	Soil	10-17-00	2.0–2.5	**ND (0.213)**	--	ND (0.736)	--
603801	58UCS-GR-207-4.0-S	Soil	10-17-00	4.0–4.5	**ND (0.222)**	--	ND (0.762)	--
603803	58UCS-GR-203-4.5-S	Soil	10-18-00	4.5–5.0	**0.255**	0.142	ND (0.403)	--
603805	58UCS-GR-208-2.0-S	Soil	10-20-00	2.0–2.5	**ND (0.179)**	--	ND (0.493)	--
603807	58UCS-GR-204-4.0-S	Soil	10-25-00	4.5–5.0	**ND (0.186)**	--	ND (0.500)	--
603809	58UCS-GR-205-4.5-S	Soil	10-27-00	4.5–5.0	**ND (0.179)**	--	ND (0.477)	--
603811	58UCS-GR-209-4.5-S	Soil	10-31-00	4.5–5.0	**ND (0.167)**	--	0.561	0.401
603811	58UCS-GR-210-4.5-S	Soil	10-31-00	4.5–5.0	**ND (0.166)**	--	0.479	0.383
Background Soil Activities—Lower Canyons Area[d]		NA	NA	NA	0.160	NA	2.31	NA

Refer to footnotes at end of table.

Table 4.5.4.3-3 (Concluded)
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
VCA Confirmatory Soil Sampling
Gamma Spectroscopy Analytical Results
October 2000
(On-Site Laboratory)

Note: Values in **bold** exceed background activity levels or have MDA values that exceed background activity levels.
[a]Thorium-232 and uranium-238 decay chain isotopes with a short half-life are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.
58UCS = SWMU 58, Underground Conduit System.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
S = Subsurface soil sample.
SWMU = Solid Waste Management Unit.
VCA = Voluntary Corrective Action.
-- = Error not calculated for nondetect results.

remaining samples contained acetone concentrations at J (estimated) values. All associated soil sample results were nondetect for acetone.

The FB samples were analyzed off site for VOCs. Acetone was detected in one blank sample at a concentration of 7.01 μg/L, while the remaining samples contained acetone concentrations at J values. Based upon the blank rule (EPA February 1994), all associated soil sample results were nondetect for acetone.

The TB samples were analyzed off site for VOCs. Acetone was detected in two of seven blank samples at a maximum concentration of 7.43 μg/L. Based upon the blank rule (EPA February 1994), all associated soil sample results were nondetect for acetone. RPDs were calculated for metals detected in the primary and duplicate samples, which were analyzed by GEL. The RPDs are presented in Table 4.5.4.5-1. The metals analyses for the sample pair for barium and mercury yielded RPDs that exceeded the acceptable RPD limit of less than 25 percent (Table 4.5.4.5-1). Although the RPDs presented in Table 4.5.4.5-1 exceed the RPD limit, the values are typical of the heterogeneous uncontaminated soil and are therefore acceptable.

Data Validation Results for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

All off-site laboratory results were reviewed and verified/validated according to "Data Verification/Validation, Level 3–DV-3," as defined in "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03, Rev. 0 (SNL/NM December 1999). The DV-3 reports are on file at the SNL/NM ER Records Center. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996) and are presented in Annex C. The verification/validation process confirms that the data are acceptable for use in this CAC proposal for SWMUs 8 and 58.

During data validation, qualifications were applied to some of the data. For AR/COC 603802, QC measures were adequate. No sample results were qualified.

For AR/COC 603798, validation qualifications were applied to the metal and organic data for soil and aqueous sample results. The EB calibration blank data for mercury did not meet QC criteria, and the result was qualified as nondetect, estimated. The percent recovery for lead was outside QC limits, and the results were qualified as estimated. The aqueous VOC calibration response factor for trichloroethene was outside QC limits, and the sample results were qualified as nondetect, estimated. Methylene chloride was detected in the aqueous method blank, and the results were qualified as not detected. The soil CCV percent difference for bromomethane was outside QC limits, and the sample results were qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 603800, validation qualifications were applied to the metal and organic data for soil and aqueous sample results. The calibration blank values for mercury were outside QC limits, and the soil sample results were qualified as estimated. The aqueous CCV percent difference for acetone was outside QC limits, and the sample results were qualified as estimated. No other sample results were qualified.

Table 4.5.4.5-1
Summary of SWMU 58, Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (Underground Conduit System)
VCA Field Duplicate Relative Percent Difference Values
October 2000
(Off-Site Laboratory)

Sample Attributes			Metals Relative Percent Difference											
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
603808	58UCS-GR-205-4.5-S 58UCS-GR-211-4.5-S	0–0.5	12.35	34.88	9.41	7.44	5.04	NA	5.41	28.01	4.69	13.76	NC	NC

[a]Analysis request/chain-of-custody record.
58UCS = SWMU 58, Underground Conduit System.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
NA = Not analyzed.
NC = Not calculated for nondetected results or laboratory estimated values.
S = Subsurface soil sample.
SWMU = Solid Waste Management Unit.
VCA =Voluntary Corrective Action.

For AR/COC 603804, validation qualifications were applied to the metal data for soil and aqueous sample results. The aqueous calibration blank values for mercury were outside QC limits, and the result was qualified as nondetect, estimated. The soil calibration blank values for mercury were outside QC limits, and the result was qualified as estimated. No other sample results were qualified.

For AR/COC 603806, validation qualifications were applied to the metal and organic data for soil and aqueous sample results. The aqueous calibration blank values for arsenic, chromium, and silver were outside QC limits, and the associated results were qualified as nondetect, estimated. The soil and aqueous calibration response factor for trichloroethene was outside QC limits, and the results were qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 603808, validation qualifications were applied to the metal and organic data for soil and aqueous sample results. Selenium was detected in soil and aqueous calibration blanks, and the results were qualified as estimated." The soil and aqueous calibration response factor for trichloroethene was outside QC limits, and the results were qualified as nondetect, estimated. No other sample results were qualified.

For AR/COC 603810, validation qualifications were applied to the metal and organic data for soil and aqueous sample results. Mercury was detected in the soil calibration blanks, and the associated results were qualified as estimated. The soil and aqueous calibration response factor was outside QC limits for trichloroethene, and the results were qualified as nondetect, estimated. An internal standard was outside QC limits for the soil samples, and the results for 1,1,1-trichloroethane, carbon tetrachloride, bromodichloromethane, 1,2-dichloropropane, cis-1,3-dichloropropene, dibromochloromethane, 1,1,2-trichloroethane, benzene, trans-1,3-dichloropropene, and bromoform were qualified as nondetect, estimated. Acetone was detected in the EB, TB, and FB samples, and associated results were qualified as not detected. No other sample results were qualified.

4.5.4.6 Data Gaps for SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF (UCS)

No data gaps remained in the characterization of the SWMU 58 UCS (SWMUs 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF) upon the completion of the VCA.

4.6 Summary of Remediation Activities for SWMUs 8 and 58

A variety of housekeeping, VCA, and VCM activities have been conducted to remediate SWMUs 8 and 58. Table 4.6-1 summarizes the status of all features at the two sites.

Table 4.6-1
Status of Features at SWMU 8 and SWMU 58

Feature Location (on Figure 2.1-3)[a]	Description of Feature Prior to Cleanup, if Applicable	Status of Feature
58A[b]	Three data transmission cables extending out of the ground between two I-beams.	Remediated (debris and/or soil removed).
58B	Pit filled with wooden debris.	Remediated (debris and/or soil removed).
58C[b]	Pit lined with 18 in. concrete blocks bolted together with metal plates. Soil is mounded to the top of block exterior, interior filled with dirt and tumbleweeds. Built to protect instrumentation during the Greenhouse tests.	Removed nonhazardous material; soil feature left in place.
58D[b]	Underground bunker, opening to the west (Building 9800).	Removed under decontamination and demolition activities.
58E	Soil mound with buried debris.	Soil feature left in place.
58F	Former location of Shot Tank, currently level with some concrete debris on surface. Mound is located directly to the north of former Shot Tank.	Removed nonhazardous material; soil feature left in place.
58G	U-shaped earthen bunker used to conduct HALO tests. The bunker has sloped concrete interior walls clad with metal armor plate surrounding the test area. Test area walls have instrumentation ports in each of the three sides. The north side of the bunker is open.	Removed under decontamination and demolition activities.
58H	Small pit and borrow mound.	Soil feature left in place.
58I	Missile Trap Test location containing two shallow pits with construction debris.	Remediated (debris and/or soil removed).
58J	Concrete pad with trenches for running cable. The buried portions of cut-off telephone poles are present on the east and west edges of the pad.	Nonhazardous material and soil feature left in place.
58K	Concrete wall with a structure constructed out of 18-in. concrete blocks bolted together with metals plates. In the center of the structure is a metal room containing control/breaker boxes and a work bench.	Removed under decontamination and demolition activities.
58L	Degraded asphalt pad with vegetation growing through it.	Nonhazardous material and soil feature left in place.
58M[b]	Small soil mound.	Soil feature left in place.
58N[b]	Concrete pad with metal square brackets bolted perpendicularly to the pad. An opening is located in the center of the pad that may be a wiring/instrumentation box.	Removed concrete pad; soil feature left in place.

Refer to footnotes at end of table.

Table 4.6-1 (Continued)
Status of Features at SWMU 8 and SWMU 58

Feature Location (on Figure 2.1-3)[a]	Description of Feature Prior to Cleanup, if Applicable	Status of Feature
58N2[b]	Concrete pad (like "N" above) with the same metal mounting areas but with no metal brackets installed.	Removed concrete pad; soil feature left in place.
58O	Empty pit with a mound to the north, a cut-off telephone pole to the east, a horizontal metal pipe extending from the center of the pit to beyond the pit to the west, an empty open-top drum is lying on its side in the pit.	Removed nonhazardous material; soil feature left in place.
58P[b]	Two concrete blocks of the type used for the Force-On-Structure tests.	Removed concrete blocks.
58Q[b]	Degraded asphalt strip.	Nonhazardous material left in place.
58R[b]	Degraded asphalt strip.	Nonhazardous material left in place.
58S	Blast point for Force-On-Structure tests.	Soil feature left in place.
58T[b]	Single-point radiation anomaly, small dark plastic/ceramic chunk.	Removed ceramic chunk, soil feature left in place.
58U	Electromagnetic/Doppler radar test site, disturbed area.	Soil feature left in place.
58V[b]	Trailer shelter with a sod-covered roof and wooden walls on the south and east. The shelter is open to the north and west.	Removed under decontamination and demolition activities.
58W	Concrete firing bunker with a viewing slit in the south wall and metal armor on top (Building 9801).	Removed under decontamination and demolition activities.
58X	Blast-loading-on-pavement firing point.	Soil feature left in place.
8Y	Debris pile of mostly metal and wood.	Remediated (debris and/or soil removed).
58Z	Greenhouse test-blast point.	Soil feature left in place.
58AA	Underground conduit manhole cover.	Removed under decontamination and demolition activities.
58BB	Underground conduit manhole cover.	Removed under decontamination and demolition activities.
58CC[b]	End point of control cables.	Removed nonhazardous material; soil feature left in place.
58DD[b]	Concrete corrugated sheeting debris (possibly containing asbestos).	Remediated (debris and/or soil removed).
58EE[b]	Six square concrete blocks.	Removed concrete blocks.
58FF	Pile of fire bricks. Site of the Mark 17 weapon burn test.	Remediated (debris and/or soil removed).
58GG[b]	Two degraded concrete chunks.	Removed concrete chunks.
58HH[b]	Circuit box and end of buried electrical cable.	Removed nonhazardous material; soil feature left in place.
58II[b]	Electrical terminal board.	Remediated (debris and/or soil removed).
58JJ	A stack of approximately ten telephone poles.	Removed poles.
58KK[b]	Firing cable down arroyo.	Remediated (debris and/or soil removed).
58LL[b]	Large pile of rusty metal plates.	Remediated (debris and/or soil removed).
58MM[b]	Electronic components.	Remediated (debris and/or soil removed).

Refer to footnotes at end of table.

Table 4.6-1 (Concluded)
Status of Features at SWMU 8 and SWMU 58

Feature Location (on Figure 2.1-3)[a]	Description of Feature Prior to Cleanup, if Applicable	Status of Feature
58NN[b]	Degraded battery.	Removed battery.
58OO	Open Borehole.	Soil feature left in place.
8PP	Open burn area, electronic debris with numerous pieces of aluminum slag.	Remediated (debris and/or soil removed).
58QQ[b]	Rusted metal sheet.	Remediated (debris and/or soil removed).
8RR	Open burn area, electronic debris with numerous pieces of aluminum slag.	Remediated (debris and/or soil removed).
58SS	Open Borehole No.1.	Soil feature left in place.
58TT	Fire Brick Area No. 2.	Remediated (debris and/or soil removed).
58UU	Fire Brick Area No. 3.	Remediated (debris and/or soil removed).
58VV	Fire Brick Area No. 1.	Remediated (debris and/or soil removed).
58WW	Three wooden poles and metal pipe.	Remediated (debris and/or soil removed).
58XX	Concrete Pad No. 2.	Nonhazardous material left in place.
58YY	Concrete Pad No. 1.	Nonhazardous material left in place.
58ZZ	Open Borehole No. 2.	Soil feature left in place.
58AAA	Building 9800 Dry Well.	Nonhazardous material left in place.
58BBB[b]	Scrap Metal.	Remediated (debris and/or soil removed).
58CCC	Building 9805 Drainpipe.	Nonhazardous material left in place.
8DDD	Explosive Contaminated Area.	Soil feature left in place.
58EEE	Underground Conduit Manhole cover.	Removed under decontamination and demolition activities.
58FFF	Underground Conduit Manhole cover.	Removed under decontamination and demolition activities.
8GGG	Arroyo Area.	Soil feature left in place.

[a]Geographical coordinates of feature are provided in the SNL/NM ES&H and Security Records Center.
[b]Site consisted of 1) minor debris, wires, concrete, etc.; 2) a small mound or area of asphalt or concrete; 3) a small radiological item that was surveyed and removed; 4) electrical debris that was removed; or 5) a decommissioned structure. This site required no RFI investigation.
ES&H = Environmental Safety and Health.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

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5.0 CONCEPTUAL SITE MODELS FOR SWMUs 8 AND 58

The conceptual site models for SWMUs 8 and 58 are based upon the site histories, hydrogeologic setting, and residual COCs identified in soil samples collected from the two sites. In response to the NMED's verbal request (Mignardot October 2004), the sites were divided into five areas which were then evaluated. Five conceptual site models were developed for the following areas:

- SWMUs 8 and 58 Combination Area
- SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area
- SWMU 8, Features 8PP and 8RR–Area of Open Burning
- SWMU 58, Feature 58FF–Pile of Fire Bricks
- SWMU 58, Feature 58TT–Fire Brick Area No. 2

5.1 Nature and Extent of Contamination

The COCs at SWMUs 8 and 58 consist of various metals, organic compounds, and radionuclides that were released by previous research activities conducted at the former test features and from the disposal of test-related debris. Metal and radionuclide COCs were determined by comparing soil sample results to background concentrations or to background levels previously established for the Canyon Area (Dinwiddie September 1997, Garcia November 1998, and Tharp February 1999). All metals and radionuclides exceeding background values for any sample are considered potential COCs. All detected organic compounds are considered potential COCs.

Annex A presents the Risk Assessment Report for SWMUs 8 and 58 that evaluates each of the five areas for which a conceptual site model was developed. The nature and extent of contamination applicable to each of the areas are discussed separately in Sections 5.1.1 through 5.1.5.

5.1.1 Nature and Extent of Contamination at SWMUs 8 and 58 Combination Area

Table 5.1.1-1 lists the COCs for the SWMUs 8 and 58 Combination area. The SWMUs 8 and 58 combination area includes all sites investigated and remediated within this area. The following metals are considered COCs for the SWMUs 8 and 58 Combination area:

- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Zinc

Table 5.1.1-1
Summary of COCs for SWMUs 8 and 58 Combination Area

COC Type	Number of Samples	COCs Detected or with Concentrations Greater than Background or Nonquantified Background	Background Value–Canyon Group[a] (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 to 5 ft bgs at the SWMUs 8 and 58 Combination (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 ft bgs–Total Depth at the SWMUs 8 and 58 Combination (mg/kg except where noted)
Metals	296 environmental, 29 duplicate	Arsenic	9.8	38 J (Feature 58H)	137 J (Feature 58OO)
		Barium	246	465 J (Feature 58H)	988 J (Feature 58O)
		Beryllium	0.75	1.5 (Feature 8GGG)	79.3 (Feature 58FF)
		Cadmium	0.64	6.02 (Feature 58AAA)	6.02 (Feature 58AAA)
		Copper	17.1	684 (Feature 58G)	684 (Feature 58G)
		Chromium	18.8	84 (Feature 8GGG)	161 J (Feature 58FF)
		Lead	18.9	5,610 J (Feature 58FF)	15,000 (Feature 58F)
		Mercury	0.055	0.585 (Feature 58U)	0.585 (Feature 58U)
		Nickel	16.6	252 (Feature 58FF)	3,960 (Feature 58FF)
		Selenium	2.7	59 J (Feature 58H)	79 J (Feature 58E)
		Silver	<0.5	60.5 (Feature 58AAA)	60.5 (Feature 58AAA)
		Total Uranium	3.42	2.3 (Feature 58B)	2.3 (Feature 58B)
		Zinc	52.1	225 (Feature 58B)	225 (Feature 58B)
HE	210 environmental, 14 duplicate	2-amino-4,6-Dinitrotoluene	NA	0.45 J (Feature 8Y)	0.45 J (Feature 8Y)
		4-amino-2,6-Dinitrotoluene	NA	0.68 (Feature 58S)	0.68 (Feature 58S)
		HMX	NA	5.6 J (Feature 8Y)	5.6 J (Feature 8Y)
		RDX	NA	19.9 J (Feature 58O)	19.9 J (Feature 58O)
		2,4,6-Trinitrotoluene	NA	20 J (Feature 8Y)	20 J (Feature 8Y)
VOCs	118 environmental, 15 duplicate	Acetone	NA	0.021 (Feature 58O)	0.021 (Feature 58O)
		2-Butanone	NA	0.00105[b] (Feature 58SS)	0.075 (Feature 58SS)
		Chloroform	NA	0.0025[b] (Feature 58FF)	0.0025[b] (Feature 58FF)
		Ethylbenzene	NA	0.0005[b] (Feature 58FF)	0.0005[b] (Feature 58FF)
		2-Hexanone	NA	0.0157 (UCS)	0.0157 (UCS)
		Methylene chloride	NA	0.0125[b] (UCS)	0.0125[b] (UCS)
		Toluene	NA	0.0046 (Feature 58O)	0.025 (Feature 58SS)

Refer to footnotes at end of table.

Table 5.1.1-1 (Concluded)
Summary of COCs for the SWMUs 8 and 58 Combination Area

COC Type	Number of Samples	COCs Detected or with Concentrations Greater than Background or Nonquantified Background	Background Value–Canyon Group[a] (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 to 5 ft bgs at the SWMUs 8 and 58 Combination (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 ft bgs–Total Depth at the SWMUs 8 and 58 Combination (mg/kg except where noted)
SVOCs	85 environmental, 8 duplicate	Benzo(a)pyrene	NA	0.235 J (Feature 58O)	0.235 J (Feature 58O)
		Benzo(b)anthracene	NA	0.202 J (Feature 58O)	0.202 J (Feature 58O)
		Chrysene	NA	0.248 J (Feature 58O)	0.248 J (Feature 58O)
		Diethyl phthalate	NA	0.269 J (Feature 58B)	0.269 J (Feature 58B)
		m-Dinitrobenzene	NA	0.15 (Feature 58F)	0.15 (Feature 58F)
		2,4-Dinitrotoluene	NA	0.36 J (Feature 58I)	0.36 J (Feature 58I)
		bis(2-Ethylhexyl) phthalate	NA	0.342 (Feature 58O)	3.41 (Feature 58OO)
		Fluoranthene	NA	0.278 J (Feature 58O)	0.278 J (Feature 58O)
		n-Nitrosodiphenylamine	NA	0.253 J (Feature 58I)	0.253 J (Feature 58I)
		Pentachlorophenol	NA	0.27 J (Feature 58AAA)	0.27 J (Feature 58AAA)
		Pyrene	NA	0.334 J (Feature 58O)	0.334 J (Feature 58O)
Radionuclides	283 environmental, 12 duplicate	Cesium-137	1.55 pCi/g	2.96 (UCS)	2.96 (UCS)
		Thorium-232	1.03 pCi/g	5.37 (Feature 58FF)	5.37 (Feature 58FF)
		Tritium	0.021 pCi/g	0.018 (Feature 8Y)	0.043 (Feature 58B)
		Uranium-235	0.16 pCi/g	2.42 (Feature 58X)	2.42 (Feature 58X)
		Uranium-238	2.31 pCi/g	93.0 (Feature 58TT)	93.0 (Feature 58TT)

[a]NMED-approved Background Values for Canyon/Lower Canyon Group: 1. Garcia (November 1998) for metals, 2. Dinwiddie (September 1997) for gamma-emitting radionuclides (cesium-137, thorium-232, uranium-235, and uranium-238), and 3. Tharp (February 1999) for tritium.
[b]Parameter was not detected. Concentration used is one-half the highest detection limit.

bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable (background not defined for organic compounds).
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

The following HE compounds are considered COCs for the SWMUs 8 and 58 Combination area:

- 2-amino-4,6-Dinitrotoluene
- 4-amino-2,6-Dinitrotoluene
- HMX
- RDX
- 2,4,6-Trinitrotoluene

The following VOCs are considered COCs for the SWMUs 8 and 58 Combination area:

- Acetone
- 2-Butanone
- Chloroform
- Ethylbenzene
- 2-Hexanone
- Methylene chloride
- Toluene

The following SVOCs are considered COCs for the SWMUs 8 and 58 Combination area:

- Benzo(a)pyrene
- Benzo(b)anthracene
- Chrysene
- Diethyl phthalate
- m-Dinitrobenzene
- 2,4-Dinitrotoluene
- bis(2-Ethylhexyl) phthalate
- Fluoranthene
- n-Nitrosodiphenylamine
- Pentachlorophenol
- Pyrene

The following radionuclides are considered COCs for the SWMUs 8 and 58 Combination area:

- Cesium-137
- Thorium-232
- Tritium
- Uranium-235
- Uranium-238

5.1.2 Nature and Extent of Contamination at SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area

Table 5.1.1-2 lists the COCs for the SWMU 8Y/58B area. The following metals are considered COCs for the Debris Pile and Pit area (8Y/58B):

- Cadmium
- Chromium
- Copper
- Lead

Table 5.1.1-2
Summary of COCs for SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area

COC Type	Number of Samples	COCs Detected or with Concentrations Greater than Background or Nonquantified Background	Background Value–Canyon Group[a] (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 to 5 ft bgs at SWMU 8Y/58B–Debris Pile and Pit (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 ft bgs–Total Depth at SWMU 8Y/58B–Debris Pile and Pit (mg/kg except where noted)
Metals	22 environmental, 2 duplicate	Arsenic	9.8	3.17 J	3.17 J
		Barium	246	154	154
		Beryllium	0.75	0.507	0.507
		Cadmium	0.64	1.18 J	1.18 J
		Chromium	18.8	61.8	61.8
		Copper	17.1	543	543
		Lead	18.9	58.5 J	58.5 J
		Mercury	0.055	0.258	0.258
		Nickel	16.6	252	815
		Selenium	2.7	1.08	1.08
		Silver	<0.5	6.71 J	6.71 J
		Total uranium	3.42	2.3	2.3
		Zinc	52.1	225	225
HE	19 environmental, 1 duplicate	2-amino-4,6-Dinitrotoluene	NA	0.45 J	0.45 J
		4-amino-2,6-Dinitrotoluene	NA	0.48 J	0.48 J
		HMX	NA	5.6 J	5.6 J
		RDX	NA	0.27 J	0.27 J
		2,4,6-Trinitroluene	NA	20 J	20 J
VOCs	6 environmental, 1 duplicate	2-Butanone	NA	ND	0.05 J
		Methylene chloride	NA	ND	0.0098
		Toluene	NA	ND	0.017 J
SVOCs	6 environmental, 1 duplicate	Diethyl phthalate	NA	0.269 J	0.269 J
		bis(2-Ethylhexyl) phthalate	NA	ND	0.408 J
Radionuclides	20 environmental, 1 duplicate	Cesium-137	1.55 pCi/g	0.414	0.414
		Thorium-232	1.03 pCi/g	0.944	0.944
		Tritium	0.021 pCi/g	0.018	0.043
		Uranium-235	0.16 pCi/g	ND (0.240)	ND (0.240)
		Uranium-238	2.31 pCi/g	ND (0.816)	ND (0.816)

Refer to footnotes at end of table.

Table 5.1.1-2 (Concluded)
Summary of COCs for SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area

[a]NMED-approved Background Values for Canyon/Lower Canyon Group: 1. Garcia (November 1998) for metals, 2. Dinwiddie (September 1997) for gamma-emitting radionuclides (cesium-137, thorium-232, uranium-235, and uranium-238), and 3. Tharp (February 1999) for tritium.

bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Estimated concentration.
MDA = Minimum detectable activity.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable (background not defined for organic compounds).
ND = Not detected.
ND ( ) = Not detected at or above the MDA, shown in parentheses.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

- Mercury
- Nickel
- Silver
- Zinc

The following HE compounds are considered COCs for the SWMU 8Y/58B–Debris Pile and Pit area:

- 2-amino-4,6-Dinitrotoluene
- 4-amino-2,6-Dinitrotoluene
- HMX
- RDX
- 2,4,6-Trinitrotoluene

The following VOCs are considered COCs for the SWMU 8Y/58B–Debris Pile and Pit area:

- 2-Butanone
- Methylene chloride
- Toluene

The following SVOCs are considered COCs for the SWMU 8Y/58B–Debris Pile and Pit area:

- Diethyl phthalate
- bis(2-Ethylhexyl) phthalate

The following radionuclides are considered COCs for the SWMU 8Y/58B–Debris Pile and Pit area:

- Tritium
- Uranium-235

5.1.3 Nature and Extent of Contamination at SWMU 8, Features 8PP and 8RR–Area of Open Burning

Table 5.1.1-3 lists the COCs for the Area of Open Burning (8PP/8RR). One metal, selenium, is considered a COC for the area. No VOCs, SVOCs, or HE compounds are considered COCs. Two radionuclides, thorium-232 and uranium-235, are considered COCs for the Area of Open Burning.

Table 5.1.1-3
Summary of COCs for SWMU 8, Features 8PP and 8RR–Area of Open Burning

COC Type	Number of Samples	COCs Detected or with Concentrations Greater than Background or Nonquantified Background	Background Value–Canyon Group[a] (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 to 5 ft bgs at SWMU 8PP/8RR–Area of Open Burning (mg/kg except where noted)
Metals	10 environmental, 1 duplicate	Arsenic	9.8	4.6
		Barium	246	196
		Beryllium	0.75	0.746
		Cadmium	0.64	0.0823 J
		Chromium	18.8	17.6
		Lead	18.9	9.75
		Mercury	0.055	0.0126
		Nickel	16.6	13.8
		Selenium	2.7	4.05[b]
		Silver	<0.5	0.0971 J
Radionuclides	10 environmental, 1 duplicate	Cesium-137	1.55 pCi/g	0.179
		Thorium-232	1.03 pCi/g	1.07
		Uranium-235	0.16 pCi/g	ND (0.277)
		Uranium-238	2.31 pCi/g	1.04

[a]NMED-approved Background Values for Canyon/Lower Canyon Group: 1. Garcia (November 1998) for metals, 2. Dinwiddie (September 1997) for gamma-emitting radionuclides (cesium-137, thorium-232, uranium-235, and uranium-238), and 3. Tharp (February 1999) for tritium.
[b]Parameter was not detected. Concentration used is one-half the highest detection limit.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
J = Estimated concentration.
MDA = Minimum detectable activity.
MDL = Minimum detection limit.
mg/kg = Milligram(s) per kilogram.
ND ( ) = Not detected at or above the MDA, shown in parentheses.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

5.1.4 Nature and Extent of Contamination at SWMU 58, Feature 58FF—Pile of Fire Bricks

Table 5.1.1-4 lists the COCs for the Pile of Fire Bricks area (58FF). The following metals are considered COCs for the area:

- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Copper
- Lead
- Mercury
- Nickel
- Silver
- Zinc

One VOC, chloroform, is considered a COC for the Pile of Fire Bricks area. No SVOCs or HE compounds are considered COCs. The following radionuclides are considered COCs for the area:

- Thorium-232
- Uranium-235
- Uranium-238

5.1.5 Nature and Extent of Contamination at SWMU 58, Feature 58TT—Fire Brick Area No. 2

Table 5.1.1-5 lists the COCs for Fire Brick Area No. 2 (58TT). One metal, lead, is considered a COC for Fire Brick Area No. 2. No VOCs, SVOCs, or HE compounds are considered COCs. The following radionuclides are considered COCs for the area:

- Uranium-235
- Uranium-238

Table 5.1.1-4
Summary of COCs for SWMU 58, Feature 58FF–Pile of Fire Bricks

COC Type	Number of Samples	COCs Detected or with Concentrations Greater than Background or Nonquantified Background	Background Value–Canyon Group[a] (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 to 5 ft bgs at Feature 58FF–Pile of Fire Bricks (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 to 5 ft bgs–Total Depth at Feature 58FF–Pile of Fire Bricks (mg/kg except where noted)
Metals	88 environmental, 5 duplicate	Arsenic	9.8	6.1	103 J
		Barium	246	318	585
		Beryllium	0.75	0.601	79.3
		Cadmium	0.64	0.5[b]	0.875
		Chromium	18.8	43.5	161 J
		Copper	17.1	38	62.1 J
		Lead	18.9	5,610 J	15,000
		Mercury	0.055	0.05[b]	0.273
		Nickel	16.6	61.1	3,960
		Selenium	2.7	1.04	1.28
		Silver	<0.5	1.0[b]	1.0[b]
		Zinc	52.1	70.2	108 J
HE	21 environmental, 3 duplicate	None	NA	NA	NA
VOCs	21 environmental, 1 duplicate	Chloroform	NA	0.0025[b]	0.0025[b]
SVOCs	21 environmental, 1 duplicate	None	NA	NA	NA
Radionuclides	45 environmental, 1 duplicate	Cesium-137	1.55 pCi/g	1.06	1.06
		Thorium-232	1.03 pCi/g	5.37	5.37
		Uranium-235	0.16 pCi/g	ND (0.635)	ND (0.635)
		Uranium-238	2.31 pCi/g	ND (6.14)	ND (6.14)

[a]NMED-approved Background Values for Canyon/Lower Canyon Group: 1. Garcia (November 1998) for metals, 2. Dinwiddie (September 1997) for gamma-emitting radionuclides (cesium-137, thorium-232, uranium-235, and uranium-238), and 3. Tharp (February 1999) for tritium.
[b]Parameter was not detected. Concentration used is one-half the highest detection limit.

bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
HE = High explosive(s).
J = Estimated concentration.
MDA = Minimum detectable activity.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable (background not defined for organic compounds).
ND = Not detected.
ND ( ) = Not detected at or above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 5.1.1-5
Summary of COCs for SWMU 58, Feature 58TT–Fire Brick Area No. 2

COC Type	Number of Samples	COCs Detected or with Concentrations Greater than Background or Nonquantified Background	Background Value–Canyon Group[a] (mg/kg except where noted)	Maximum Concentration or Activity for Soil Samples Collected from 0 to 5 ft bgs at Feature 58TT–Fire Brick Area No. 2 (mg/kg except where noted)
Metals	6 environmental, 1 duplicate	Arsenic	9.8	3.18
		Barium	246	150
		Beryllium	0.75	0.426 J
		Cadmium	0.64	0.207 J
		Chromium	18.8	10.2
		Lead	18.9	78.8
		Mercury	0.055	0.00749 J
		Nickel	16.6	10.1
		Selenium	2.7	0.0675[b]
		Silver	<0.5	0.253 J
HE	6 environmental, 0 duplicate	None	NA	NA
Radionuclides	6 environmental, 1 duplicate	Cesium-137	1.55 pCi/g	0.155
		Thorium-232	1.03 pCi/g	0.901
		Uranium-235	0.16 pCi/g	1.49
		Uranium-238	2.31 pCi/g	93.0

[a]NMED-approved Background Values for Canyon/Lower Canyon Group: 1. Garcia (November 1998) for metals, 2. Dinwiddie (September 1997) for gamma-emitting radionuclides (cesium-137, thorium-232, uranium-235, and uranium-238), and 3. Tharp (February 1999) for tritium.
[b]Parameter was not detected. Concentration used is one-half the highest detection limit.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
HE = High explosive(s).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable (background not defined for organic compounds).
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

5.2 Environmental Fate

The primary sources of COCs at SWMUs 8 and 58 were the research operations conducted at the former test-related features and the disposal of associated debris. Subsequent remediation conducted at the two sites has involved the removal and off-site disposal of radioactive, hazardous, asbestos, and nonregulated waste at permitted facilities.

Figures 5.2-1 through 5.2-5 depict the primary release mechanisms for COCs at each of the five areas evaluated. The COCs were released to the surface soil by mechanisms such as outdoor detonation of test articles using HE compounds, direct contact of the associated debris with the native soil, or burning of petroleum fuels. Rare, but heavy, rainstorms can create soil erosion at SWMUs 8 and 58. Therefore, erosion could be considered a release mechanism for COCs at the areas evaluated.

Tables 5.1.1-1 through 5.1.1-5 summarize the potential COCs for each of the five areas. Based upon the nature and extent of contamination, COCs consisting of metals, radionuclides, HE compounds, VOCs, and SVOCs occur in shallow soil at locations scattered throughout the area. Along the arroyo floors, the depth to groundwater may be approximately 50 feet bgs. High partitioning coefficients and low mobility of the COCs in soil media indicate that the COCs will not migrate appreciably, but will tend to stay fixed in the soil. Therefore, groundwater is not considered a viable contaminant pathway. All potential COCs were retained in the conceptual site models and were evaluated in the human health and ecological risk assessments.

The current and future land use for SWMUs 8 and 58 is industrial (DOE et al. October 1995). Therefore, the potential human receptor is considered to be an industrial user for each of the five areas evaluated. For all applicable pathways, the exposure routes for the user are dermal contact and ingestion/inhalation. Ecological receptors also were considered. No pathway to groundwater and no intake routes through flora or fauna are considered appropriate for either the industrial or residential land-use scenarios. Section V in Annex A provides additional discussion of the exposure routes and receptors for each of the areas evaluated.

5.3 Site Assessments

Site assessment at SWMUs 8 and 58 included risk assessments for both human health and ecological risk. This section briefly summarizes the site assessment results, and Annex A discusses the risk assessment performed for SWMUs 8 and 58 in more detail.

5.3.1 Summary

The site assessment concluded that the SWMU 8 and 58 areas evaluated pose no significant threat to human health under either the industrial or residential land-use scenarios, with the exception of the Pile of Fire Bricks area (58FF). This area poses no significant threat to human health under the industrial land use scenario, but presents a potential significant threat to human health under the residential land-use scenario due to high metal concentrations, primarily lead. Ecological risks were found to be low for all five SWMU 8 and 58 areas evaluated.

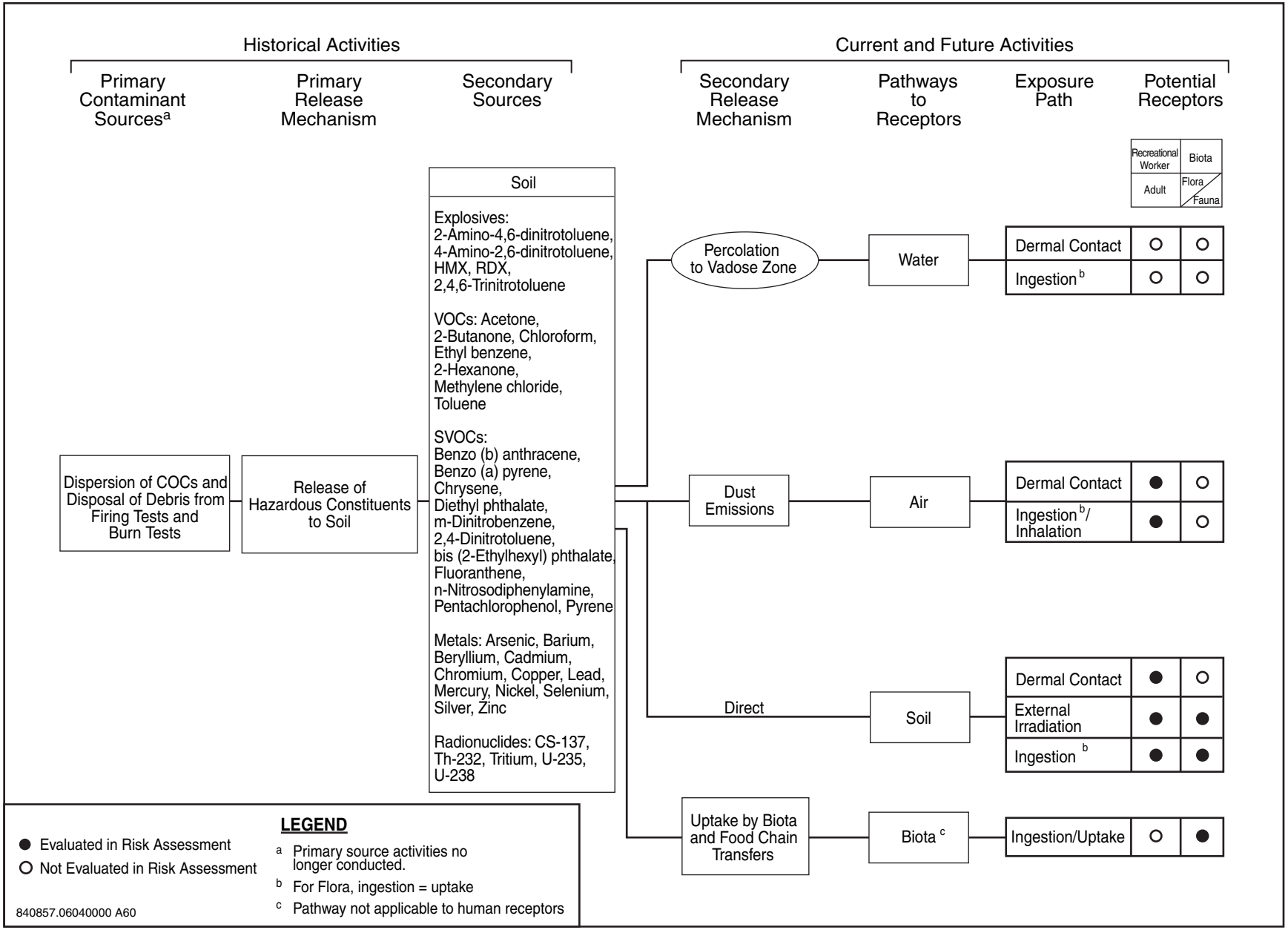

Figure 5.2-1

Conceptual Site Model Flow Diagram for SWMUs 8 and 58 Combination Area

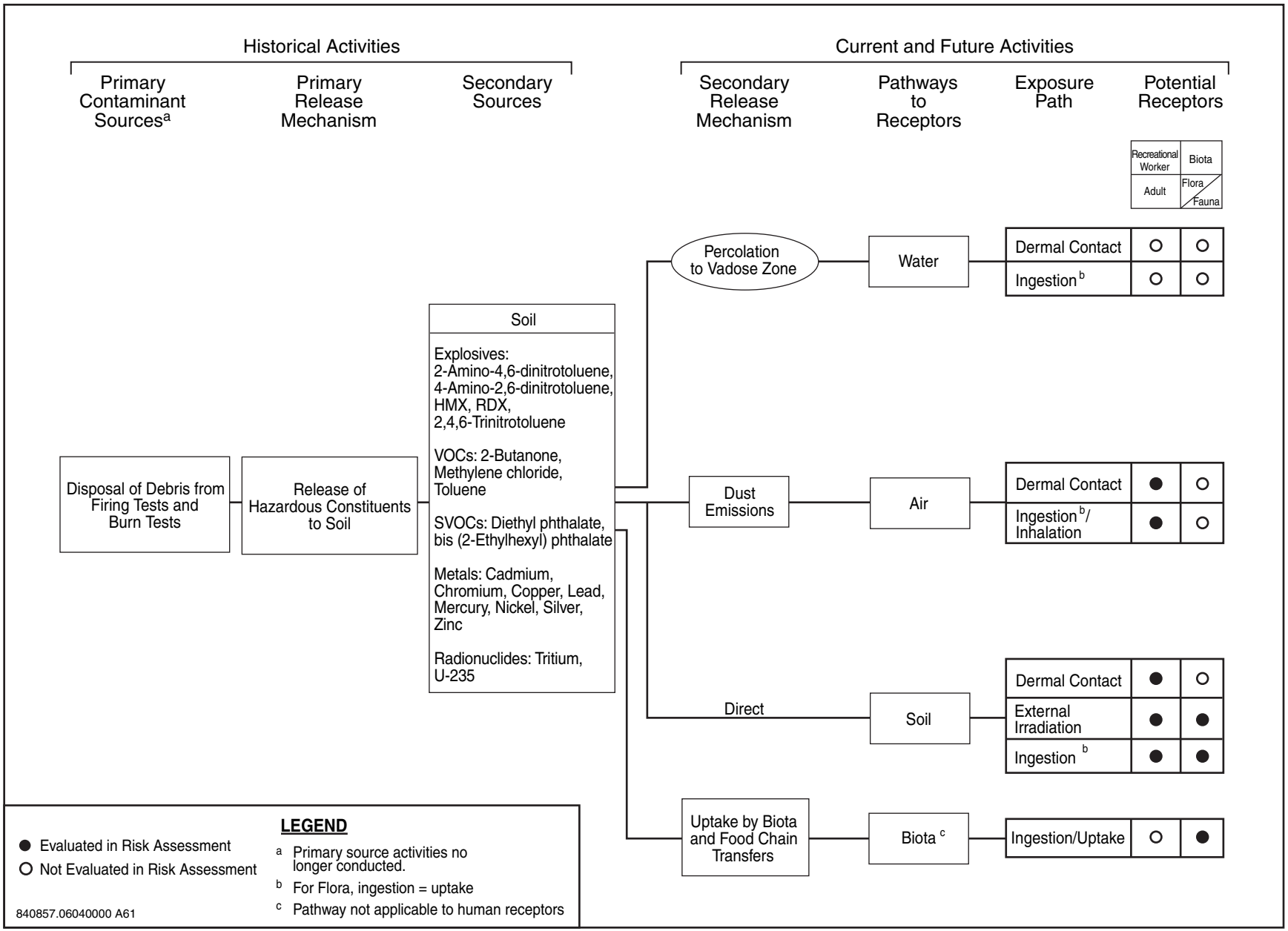

Figure 5.2-2

Conceptual Site Model Flow Diagram for SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area

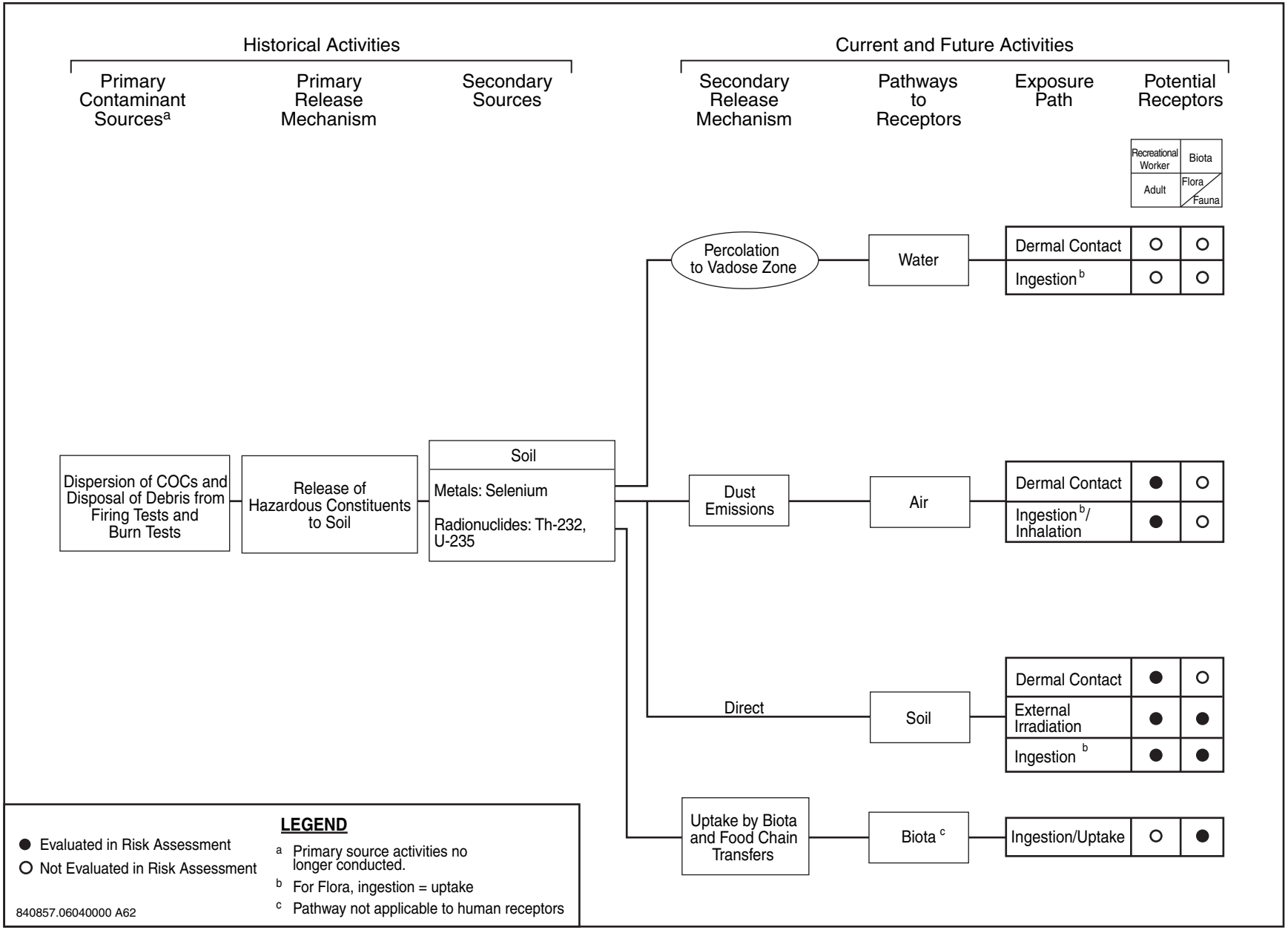

Figure 5.2-3

Conceptual Site Model Flow Diagram for SWMU 8, Features 8PP and 8RR, Area of Open Burning

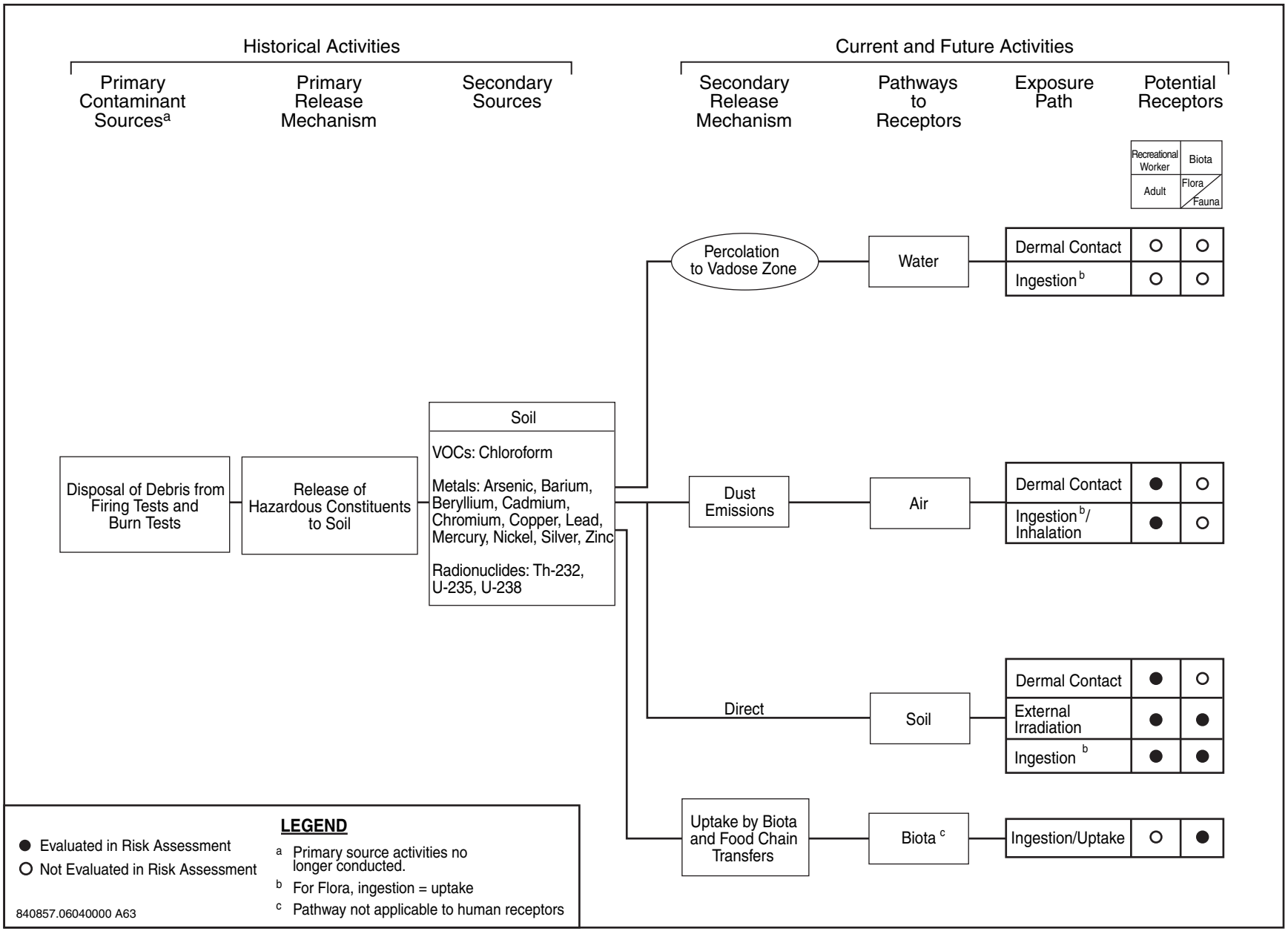

Figure 5.2-4

Conceptual Site Model Flow Diagram for SWMU 58, Feature 58FF, Pile of Fire Bricks

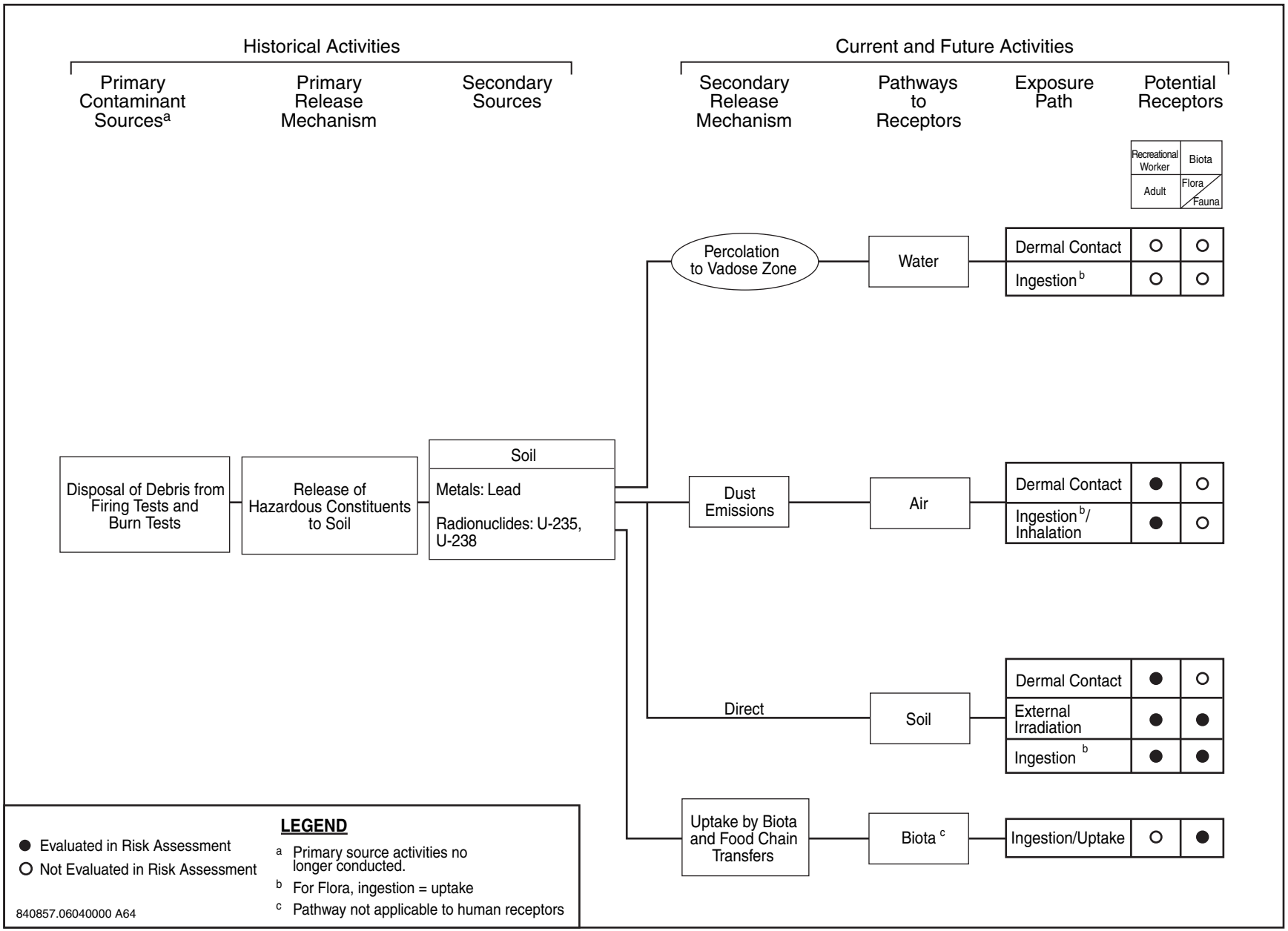

Figure 5.2-5

Conceptual Site Model Flow Diagram for SWMU 58, Feature 58TT, Fire Brick Area No. 2

5.3.2 Risk Assessments

Risk assessments were performed for both human health and ecological risk at five SWMU 8 and 58 areas. The following sections summarize the results for each of the five areas evaluated.

5.3.2.1 Risk Assessments for SWMUs 8 and 58 Combination Area

This section summarizes the findings for the human health and ecological risk assessments for the SWMUs 8 and 58 Combination area.

5.3.2.1.1 Human Health Risk Assessment

The SWMUs 8 and 58 Combination area has been recommended for an industrial land-use scenario (DOE et al. October 1995). Because COCs are present above background or have nonquantified background levels, it was necessary to perform a human health risk assessment analysis for the site, which included these COCs. Annex A provides a complete discussion of the risk assessment process, results, and uncertainties. The risk assessment process provides a quantitative evaluation of the potential adverse human health effects from constituents in the site's soil by calculating the hazard index (HI) and excess cancer risk for both industrial and residential land-use scenarios.

The HI calculated for the COCs at the SWMUs 8 and 58 Combination area is 0.94 for the industrial land-use scenario, which is less than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 0.90. The excess cancer risk for the COCs at the SWMUs 8 and 58 Combination area is 9E-5 for an industrial land use scenario. The NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is above the suggested acceptable risk value. The incremental excess cancer risk is 8.3E-5; it is above NMED guidance. The incremental HI is below NMED guidelines.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the upper confidence limit (UCL) of the mean concentrations for the main contributors to excess cancer risk (arsenic, barium, beryllium, cadmium, copper, nickel, selenium, silver, benzo[a]pyrene, RDX, and 2,4,6-trinitrotoluene) reduces the total and incremental estimated excess cancer risk to 7E-6 and 1.05E-6 respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental estimated excess cancer risk values are below NMED guidelines.

The HI calculated for the COCs at the SWMUs 8 and 58 Combination area is 11.25 for the residential land-use scenario, which is greater than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 10.7. The excess cancer risk for the COCs at the SWMUs 8 and 58 Combination area is 4E-4 for a residential land use scenario. NMED guidance states that cumulative excess lifetime cancer

risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is above the suggested acceptable risk value. The incremental excess cancer risk is 3.37E-4. Both the incremental HI and incremental excess cancer risk are above NMED guidelines.

Although both the HI and estimated excess cancer risk are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to excess cancer risk and hazards (arsenic, barium, beryllium, cadmium, copper, nickel, selenium, silver, benzo[a]pyrene, RDX, 2,4,6-trinitrotoluene) reduces the total HI and estimated excess cancer risk to 0.72 and 3E-5, respectively. The incremental HI and excess cancer risk are reduced to 0.17 and 3.57E-6, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and incremental estimated excess cancer risk values are below NMED guidelines.

For the radiological COCs, five of the constituents (tritium, cesium-137, thorium-232, uranium-235, and uranium-238) had either activity levels or MDA values greater than the corresponding background values. The incremental total effective dose equivalent (TEDE) is 1.2E+1 millirem (mrem)/year (yr) for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997a). The corresponding incremental estimated cancer risk value is 1.3E-4 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 3.1E+1 mrem/yr with an associated risk of 4.0E-4. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998b). Therefore, the SWMUs 8 and 58 Combination area is eligible for unrestricted radiological release.

The incremental nonradiological and radiological carcinogenic risks are tabulated and summed in Table 5.3.2.1.1-1

Table 5.3.2.1.1-1
Summation of Incremental Nonradiological and Radiological Risks from SWMUs 8 and 58 Combination Area

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	1.05E-6[a]	1.3E-4	1.3E-4
Residential	3.57E-6 [a]	4.0E-4	4.0E-4

[a]Incremental risk calculated using the UCL of the mean concentrations for the primary risk drivers.
SWMU = Solid Waste Management Unit.'
UCL = Upper confidence limit.

Uncertainties associated with the calculations are considered small relative to the conservatism of the risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under both the industrial and residential land-use scenarios.

5.3.2.1.2 Ecological Risk Assessment

An ecological assessment that corresponds with the procedures in the EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997b) also was performed as set forth by the NMED Risk-Based Decision Tree in the "RPMP [RCRA Permits Management Program] Document Requirement Guide" (NMED March 1998). An early step in the evaluation compared COC concentrations and identified potentially bioaccumulative constituents (see Annex A, Sections IV, VII.2, and VII.2.1). This methodology also required developing a conceptual site model and food web model, as well as selecting ecological receptors, as presented in "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico" (IT July 1998). The risk assessment also includes the estimation of exposure and ecological risk.

Based upon the uncertainty analysis (Annex A, Section VII.3.5), the potential for ecological risks at the SWMUs 8 and 58 Combination area is expected to be low. Hazard quotients (HQs) greater than unity were predicted; however, closer examination of the exposure assumptions revealed an overestimation of risk primarily attributed to conservative toxicity benchmarks; the use of maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

5.3.2.2 Risk Assessments for SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area

This section summarizes the findings for the human health and ecological risk assessments for the Debris Pile and Pit area (8Y/58B).

5.3.2.2.1 Human Health Risk Assessment

The Debris Pile and Pit area (8Y/58B) has been recommended for an industrial land-use scenario (DOE et al. October 1995). Because COCs are present above background or have nonquantified background levels, it was necessary to perform a human health risk assessment analysis for the site, which included these COCs. Annex A provides a complete discussion of the risk assessment process, results, and uncertainties. The risk assessment process provides a quantitative evaluation of the potential adverse human health effects from constituents in the site's soil by calculating the HI and excess cancer risk for both industrial and residential land-use scenarios.

The HI calculated for the COCs at the Debris Pile and Pit area is 0.13 for the industrial land-use scenario, which is less than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 0.13. The excess cancer risk for the SWMU 8Y/58B area COCs is 4E-7 for an industrial land use scenario. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is below the suggested acceptable risk value. The incremental excess cancer risk is 4.31E-7. The incremental HI and excess cancer risk are below NMED guidelines.

The HI calculated for the COCs at the SWMU 8Y/58B area is 1.47 for the residential land-use scenario, which is greater than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 1.43. The excess cancer risk for the Debris Pile and Pit area COCs is 1E-6 for a residential land use scenario. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is below the suggested acceptable risk value. The incremental excess cancer risk is 1.44E-6, which is below NMED guidelines.

Although the HI is above the NMED guideline for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to hazards (nickel and 2,4,6-trinitrotoluene) reduces the total and incremental HIs to 0.71 and 0.66, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental estimated excess cancer risk values are below NMED guidelines. In addition, none of the individual HQs for noncarcinogens exceed 1.0 at maximum concentrations.

For the radiological COCs, two of the constituents (uranium-235 and tritium) had MDA values or activities greater than the corresponding background value. The incremental TEDE is 1.2E-2 mrem/yr for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997a). The corresponding incremental estimated cancer risk value is 1.0E-7 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 3.0E-2 mrem/yr with an associated risk of 3.0E-7. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998b). Therefore, the SWMU 8Y/58B–Debris Pile and Pit area is eligible for unrestricted radiological release.

The incremental nonradiological and radiological carcinogenic risks are tabulated and summed in Table 5.3.2.2.1-1.

Table 5.3.2.2.1-1
Summation of Incremental Nonradiological and Radiological Risks from
SWMU 8, Feature 8Y and SWMU 58, Feature 58B–Debris Pile and Pit Area

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	4.31E-7	1.0E-7	5.3E-7
Residential	1.44E-6[a]	3.0E-7	1.7E-6

[a]Incremental risk calculated using the UCL of the mean concentrations for the primary risk drivers.
SWMU = Solid Waste Management Unit.
UCL = Upper confidence limit.

Uncertainties associated with the calculations are considered small relative to the conservatism of the risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under both the industrial and residential land-use scenarios.

5.3.2.2.2 Ecological Risk Assessment

An ecological assessment that corresponds with the procedures in the EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997b) also was performed as set forth by the NMED Risk-Based Decision Tree in the "RPMP Document Requirement Guide" (NMED March 1998). An early step in the evaluation compared COC concentrations and identified potentially bioaccumulative constituents (see Annex A, Sections IV, VII.2, and VII.2.1). This methodology also required developing a conceptual site model and food web model, as well as selecting ecological receptors, as presented in "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico" (IT July 1998). The risk assessment also includes the estimation of exposure and ecological risk.

Based upon the uncertainty analysis (Annex A, Section VII.3.5), the potential for ecological risks at the SWMU 8Y/58B–Debris Pile and Pit area is expected to be low. HQs greater than unity were predicted; however, closer examination of the exposure assumptions revealed an overestimation of risk primarily attributed to conservative toxicity benchmarks; the use of maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

5.3.2.3 Risk Assessments for SWMU 8, Features 8PP and 8RR–Area of Open Burning

This section summarizes the findings for the human health and ecological risk assessments for the Area of Open Burning (8PP/8RR).

5.3.2.3.1 Human Health Risk Assessment

The Area of Open Burning (8PP/8RR) has been recommended for an industrial land-use scenario (DOE et al. October 1995). Because COCs are present above background or have nonquantified background levels, it was necessary to perform a human health risk assessment analysis for the site, which included these COCs. Annex A provides a complete discussion of the risk assessment process, results, and uncertainties. The risk assessment process provides a quantitative evaluation of the potential adverse human health effects from constituents in the site's soil by calculating the HI and excess cancer risk for both industrial and residential land-use scenarios.

The HI calculated for the COCs at the Area of Open Burning is 0.00 for the industrial land-use scenario, which is less than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 0.00. There is no quantified estimated excess cancer risk for an industrial land use scenario. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is below the suggested acceptable risk value. The incremental HI and excess cancer risk are below NMED guidelines.

The HI calculated for the COCs at the Area of Open Burning is 0.01 for the residential land-use scenario, which is less than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with

background from potential nonradiological COC risk (without rounding), is 0.00. There is no quantified estimated excess cancer risk for an residential land use scenario. The NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is below the suggested acceptable risk value. The incremental HI and excess cancer risk are below NMED guidelines.

For the radiological COCs, two of the constituents (thorium-232, and uranium-235) had an activity level or MDA value greater than the corresponding background values. The incremental TEDE is 1.0E-1 mrem/yr for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997a). The corresponding incremental estimated cancer risk value is 9.4E-7 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 2.6E-1 mrem/yr with an associated risk of 3.0E-6. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, the Area of Open Burning (8PP/8RR) is eligible for unrestricted radiological release.

The incremental nonradiological and radiological carcinogenic risks are tabulated and summed in Table 5.3.2.3.1-1.

Table 5.3.2.3.1-1
Summation of Incremental Nonradiological and Radiological Risks from SWMU 8, Features 8PP and 8RR–Area of Open Burning

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	0.00	9.4E-7	9.4E-7
Residential	0.00	3.0E-6	3.0E-6

SWMU = Solid Waste Management Unit.

Uncertainties associated with the calculations are considered small relative to the conservatism of the risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under both the industrial and residential land-use scenarios.

5.3.2.3.2 Ecological Risk Assessment

An ecological assessment that corresponds with the procedures in the EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997b) also was performed as set forth by the NMED Risk-Based Decision Tree in the "RPMP Document Requirement Guide" (NMED March 1998). An early step in the evaluation compared COC concentrations and identified potentially bioaccumulative constituents (see Annex A, Sections IV, VII.2, and VII.2.1). This methodology also required developing a conceptual site model and food web model, as well as selecting ecological receptors, as presented in "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico" (IT July 1998). The risk assessment also includes the estimation of exposure and ecological risk.

Based upon the uncertainty analysis (Annex A, Section VII.3.5), the potential for ecological risks at the Area of Open Burning (8PP/8RR) is expected to be low. HQs greater than unity were predicted; however, closer examination of the exposure assumptions revealed an

overestimation of risk primarily attributed to conservative toxicity benchmarks; the use of maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

5.3.2.4 Risk Assessments for SWMU 58, Feature 58FF–Pile of Fire Bricks

This section summarizes the findings for the human health and ecological risk assessments for the Pile of Fire Bricks (58FF).

5.3.2.4.1 Human Health Risk Assessment

The Pile of Fire Bricks area (58FF) has been recommended for an industrial land-use scenario (DOE et al. October 1995). Because COCs are present above background or have nonquantified background levels, it was necessary to perform a human health risk assessment analysis for the site, which included these COCs. Annex A provides a complete discussion of the risk assessment process, results, and uncertainties. The risk assessment process provides a quantitative evaluation of the potential adverse human health effects from constituents in the site's soil by calculating the HI and excess cancer risk for both industrial and residential land-use scenarios.

As part of the normal background screening process, lead concentrations were compared to EPA and NMED guidelines. The lead concentrations for Pile of Fire Bricks exceeded the EPA guidelines for a residential land-use scenario; thus the lead screening information is discussed here. The maximum concentration value for lead is 15,000 mg/kg. The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for a construction and industrial land-use scenario are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is greater than all the screening values. However, because the site has been adequately characterized, average concentrations are more representative of actual site conditions. The UCL of the mean concentration for lead is 988 mg/kg. The UCL of the mean concentration value for lead at this site is less than the industrial screening values but is not less than the EPA screening guidance value for a residential land-use scenario.

The HI calculated for the COCs at the Pile of Fire Bricks area is 0.67 for the industrial land-use scenario, which is less than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 0.62. The excess cancer risk for COCs is 6E-5 for an industrial land use scenario. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is above the suggested acceptable risk value. The incremental excess cancer risk is 5.86E-5. The incremental HI is below NMED guidelines.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to excess cancer risk (arsenic, beryllium, and nickel) reduces the total and incremental estimated excess

cancer risk to 7E-6 and 1.08E-7, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental estimated excess cancer risk values are below NMED guidelines.

The HI calculated for the COCs at the Pile of Fire Bricks area is 8.07 for the residential land-use scenario, which is greater than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). The incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk (without rounding), is 7.52. The excess cancer risk for COCs is 3E-4 for a residential land-use scenario. The NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is above the suggested acceptable risk value. The incremental excess cancer risk is 2.40E-4. Both the incremental HI and incremental excess cancer risk values are above NMED guidelines.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to excess cancer risk (arsenic, beryllium, and nickel) and hazards reduces the total HI and estimated excess cancer risk to 0.93 and 3E-5, respectively. The incremental HI and excess cancer risk are reduced to 0.38 and 4.39E-6, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and incremental estimated excess cancer risk values are below NMED guidelines.

For the radiological COCs, three of the constituents (thorium-232, uranium-235, and uranium-238) had activity levels or MDA values greater than the corresponding background values. The incremental TEDE is 1.0E+1 mrem/yr for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997a). The corresponding incremental estimated cancer risk value is 9.6E-5 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 2.6E+1 mrem/yr with an associated risk of 3.1E-4. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, SWMU 58FF–Pile of Fire Bricks is eligible for unrestricted radiological release.

The incremental nonradiological and radiological carcinogenic risks are tabulated and summed in Table 5.3.2.4.1-1.

Table 5.3.2.4.1-1
Summation of Incremental Nonradiological and Radiological Risks from
SWMU 58, Feature 58FF–Pile of Fire Bricks

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	1.08E-6[a]	9.6E-5	9.7E-5
Residential	4.39E-6 [a]	3.1E-4	3.1E-4

[a]Incremental risk calculated using the UCL of the mean concentrations for the primary risk drivers.
SWMU = Solid Waste Management Unit.
UCL = Upper confidence limit.

Uncertainties associated with the calculations are considered small relative to the conservatism of the risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under the industrial land-use scenario. However, because of the elevated metal concentrations, and primarily lead, it poses a potential threat to human health under the residential land-use scenario.

5.3.2.4.2 Ecological Risk Assessment

An ecological assessment that corresponds with the procedures in the EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997b) also was performed as set forth by the NMED Risk-Based Decision Tree in the "RPMP Document Requirement Guide" (NMED March 1998). An early step in the evaluation compared COC concentrations and identified potentially bioaccumulative constituents (see Annex A, Sections IV, VII.2, and VII.2.1). This methodology also required developing a conceptual site model and food web model, as well as selecting ecological receptors, as presented in "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico" (IT July 1998). The risk assessment also includes the estimation of exposure and ecological risk.

Based upon the uncertainty analysis (Annex A, Section VII.3.5), the potential for ecological risks at the Pile of Fire Bricks area (58FF) is expected to be low. HQs greater than unity were predicted; however, closer examination of the exposure assumptions revealed an overestimation of risk primarily attributed to conservative toxicity benchmarks; the use of maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

5.3.2.5 Risk Assessments for SWMU 58, Feature 58TT–Fire Brick Area No. 2

This section summarizes the findings for the human health and ecological risk assessments for Fire Brick Area No. 2 (58TT).

5.3.2.5.1 Human Health Risk Assessment

Because lead is the only nonradiological COC that exceeds its background value (it was below the EPA residential screening level) and no organic compounds were detected, these COCs are eliminated from further evaluation in the risk assessment for the industrial land-use scenario. Therefore, it is concluded that this site poses insignificant risk to human health under the industrial land-use scenario.

Because lead is the only nonradiological COC that exceeds its background value (it was below the EPA residential screening level) and no organic compounds were detected, these COCs are eliminated from further evaluation in the risk assessment for the residential land-use scenario. Therefore, it is concluded that this site poses insignificant risk to human health under the residential land-use scenario.

For the radiological COCs, two of the constituents (uranium-235 and uranium-238) had activity levels greater than the corresponding background values. The incremental TEDE is 2.6 mrem/yr for the industrial land-use scenario, which is much lower than the EPA's numerical

guidance of 15 mrem/yr (EPA 1997a). The corresponding incremental estimated cancer risk value is 2.3E-5 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 6.8 mrem/yr with an associated risk of 6.8E-5. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, Fire Brick Area No. 2 (58TT) is eligible for unrestricted radiological release.

The incremental nonradiological and radiological carcinogenic risks are tabulated and summed in Table 5.3.2.5.1-1.

Table 5.3.2.5.1-1
Summation of Incremental Nonradiological and Radiological Risks from
SWMU 58, Feature 58TT–Fire Brick Area No. 2

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	0.00	2.3E-5	2.3E-5
Residential	0.00	6.8E-5	6.8E-5

SWMU = Solid Waste Management Unit.

Uncertainties associated with the calculations are considered small relative to the conservatism of the risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under both the industrial and residential land-use scenarios.

5.3.2.5.2 Ecological Risk Assessment

An ecological assessment that corresponds with the procedures in the EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997b) also was performed as set forth by the NMED Risk-Based Decision Tree in the "RPMP Document Requirement Guide" (NMED March 1998). An early step in the evaluation compared COC concentrations and identified potentially bioaccumulative constituents (see Annex A, Sections IV, VII.2, and VII.2.1). This methodology also required developing a conceptual site model and food web model, as well as selecting ecological receptors, as presented in the "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico" (IT July 1998). The risk assessment also includes the estimation of exposure and ecological risk.

Based upon the uncertainty analysis (Annex A, Section VII.3.5), the potential for ecological risks at Fire Brick Area No. 2 (58TT) is expected to be very low. Lead is the only constituent of potential ecological concern with a value that slightly exceeded unity (1.6) after conservative exposure assumptions were analyzed. Other HQs greater than unity were initially predicted; however, closer examination of the exposure assumptions revealed an overestimation of risk primarily attributed to conservative toxicity benchmarks; use of the maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

5.4 Baseline Risk Assessments

This section discusses the baseline risk assessments for human health and ecological risk.

5.4.1 Human Health

Because the results of the human health risk assessment summarized in Sections 5.3.2.1.1, 5.3.2.2.1, 5.3.2.3.1, 5.3.2.4.1, and 5.3.2.5.1 indicate that the SWMU 8 and 58 areas evaluated pose insignificant risk to human health under both the industrial and residential land use scenarios, with the exception of the Pile of Fire Bricks (58FF), a baseline human health risk assessment is not required for this site. SWMU 58, Feature 58FF (Pile of Fire Bricks) poses no significant threat to human health under the industrial land use scenario, but presents a potential significant threat to human health under the residential land-use scenario due to high metal concentrations, primarily lead.

5.4.2 Ecological

Because the results of the ecological risk assessment summarized in Sections 5.3.2.1.2, 5.3.2.2.2, 5.3.2.3.2, 5.3.2.4.2, and 5.3.2.5.2 predict low ecological risk, a baseline ecological risk assessment is not required for the SWMU 8 and 58 areas evaluated.

5.4.3 Other Applicable Assessments

A surface-water site assessment was conducted at SWMUs 8 and 58 in September 1998 according to guidance developed jointly by Los Alamos National Laboratory and the NMED Surface-Water Quality Bureau (LANL August 1998). SWMUs 8 and 58 received scores of 49 and 54, respectively, indicating that the sites have a moderate erosion potential primarily due to the lack of both vegetative and rock cover (Annex D). Because both sites have been remediated and risk assessments for the confirmatory soil-sampling results indicate that no significant contamination remains, surface-water quality is not expected to be significantly degraded.

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6.0 RECOMMENDATION FOR CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS DETERMINATION

6.1 Rationale

Based upon field investigation data and the corresponding human health and ecological risk assessments for four of five conceptual models, a risk-based determination of CAC without controls is recommended for SWMUs 8 and 58 for the following reasons:

- The soil has been sampled for all potential COCs.
- No COCs are present in the soil at levels considered hazardous to human health for either an industrial or residential land-use scenario.
- None of the COCs warrant ecological concern because the ecological risks were acceptable per NMED guidance.

Based upon field investigation data and the corresponding human health and ecological risk assessments for the SWMU 58FF conceptual model, a risk-based determination of CAC with controls is recommended for SWMU 58FF for the following reasons:

- The soil has been sampled for all potential COCs.
- Lead is present in the soil at levels that exceed the EPA residential screening level.
- None of the COCs warrant ecological concern because the ecological risks were acceptable per NMED guidance.

6.2 Criterion

Based upon the evidence provided above, a determination of CAC without controls (NMED April 2004) is recommended for SWMUs 8 and 58 (except SWMU 58FF, which is recommended for CAC with controls). This is consistent with NMED's Criterion 5 which states, "the SWMU/AOC has been characterized or remediated in accordance with current applicable state or federal regulations, and that available data indicate that contaminants pose an acceptable level of risk under current and projected future land use" (NMED March 1998).

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ANNEX A
Risk Assessment for
SWMUs 8 and 58

TABLE OF CONTENTS

I. Site Description and History A-1
II. Data Quality Objectives A-2
II.1 Data Quality Objectives for SWMUs 8 and 58 Combination Area A-5
II.2 Data Quality Objectives for SWMUs 8 and 58, Features 8Y and 58B—Debris Pile and Pit Area A-22
II.3 Data Quality Objectives for SWMU 8, Features 8PP and 8RR—Area of Open Burning A-26
II.4 Data Quality Objectives for SWMU 58, Feature 58FF—Pile of Fire Bricks A-28
II.5 Data Quality Objectives for SWMU 58, Feature 58TT—Fire Brick Area No. 2 ..... A-32
III. Determination of Nature, Rate, and Extent of Contamination A-34
III.1 Introduction A-34
III.2 Nature of Contamination A-34
III.3 Rate of Contaminant Migration A-34
III.4 Extent of Contamination A-34
IV. Comparison of COCs to Background Screening Levels A-35
V. Fate and Transport A-35
VI. Human Health Risk Assessment A-55
VI.1 Introduction A-55
VI.2 Step 1. Site Data A-56
VI.3 Step 2. Pathway Identification A-56
VI.4 Step 3. Background Screening Procedure A-67
VI.4.1 Methodology A-67
VI.4.2 Results A-67
VI.5 Step 4. Identification of Toxicological Parameters A-69
VI.6 Step 5. Exposure Assessment and Risk Characterization A-73
VI.6.1 Exposure Assessment A-73
VI.6.2 Risk Characterization A-73
VI.7 Step 6. Comparison of Risk Values to Numerical Guidelines A-83
VI.8 Step 7. Uncertainty Discussion A-88
VI.9 Summary A-88
VII. Ecological Risk Assessment A-95
VII.1 Introduction A-95
VII.2 Scoping Assessment A-96
VII.2.1 Data Assessment A-96
VII.2.2 Bioaccumulation A-97
VII.2.3 Fate and Transport Potential A-98
VII.2.4 Scoping Risk-Management Decision A-98
VII.3 Risk Assessment A-98
VII.3.1 Problem Formulation A-99
VII.3.2 Exposure Estimation A-100
VII.3.3 Ecological Effects Evaluation A-102
VII.3.4 Risk Characterization A-110

TABLE OF CONTENTS (Concluded)

VII.3.5 Uncertainty Assessment A-117
VII.3.6 Risk Interpretation A-124
VII.3.7 Risk Assessment Scientific/Management Decision Point A-125
VIII. References A-125

Appendix 1 ..... A-133
Appendix 2 ..... A-145

LIST OF TABLES

Table **Page**

A-1 Soil Sampling Locations for SWMUs 8 and 58 Combination Area A-6

A-2 Analytes and Analytical Laboratories for SWMUs 8 and 58 Combination Area A-9

A-3 Number of Analyses for Soil Samples Collected for SWMUs 8 and 58 Combination Area A-12

A-4 Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58 Combination Area A-16

A-5 Soil Sampling Locations for SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area A-22

A-6 Analytes and Analytical Laboratories for SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area A-23

A-7 Number of Analyses for Soil Samples Collected for SWMUs 8 and 58, Features 8Y and 58B—Debris Pile and Pit Area A-24

A-8 Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area A-25

A-9 Soil Sampling Locations for SWMU 8, Features 8PP and 8RR, Area of Open Burning A-26

A-10 Analytes and Analytical Laboratories for SWMU 8, Features 8PP and 8RR, Area of Open Burning A-26

A-11 Number of Analyses for Soil Samples Collected for SWMU 8, Features 8PP and 8RR, Area of Open Burning A-27

A-12 Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for Confirmatory Soil Samples for SWMU 8, Features 8PP and 8RR, Area of Open Burning A-27

A-13 Soil Sampling Locations for SWMU 58, Feature 58FF, Pile of Fire Bricks A-28

A-14 Analytes and Analytical Laboratories for SWMU 58, Feature 58FF, Pile of Fire Bricks A-29

A-15 Number of Analyses for Soil Samples Collected for SWMU 58, Feature 58FF, Pile of Fire Bricks A-30

LIST OF TABLES (Continued)

Table **Page**

A-16 Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI Soil Samples for SWMU 58, Feature 58FF, Pile of Fire Bricks A-31

A-17 Soil Sampling Locations for SWMU 58, Feature 58TT, Fire Brick Area No. 2 ..... A-32

A-18 Analytes and Analytical Laboratories for SWMU 58, Feature 58TT, Fire Brick Area No. 2 ..... A-32

A-19 Number of Analyses for Soil Samples Collected for SWMU 58, Feature 58TT, Fire Brick Area No. 2 ..... A-33

A-20 Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for Confirmatory Soil Samples for SWMU 58, Feature 58TT, Fire Brick Area No. 2 ..... A-33

A-21 Nonradiological COCs for Human Health Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-36

A-22 Nonradiological COCs for Ecological Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-38

A-23 Nonradiological COCs for Human Health Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-40

A-24 Nonradiological COCs for Ecological Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-42

A-25 Nonradiological COCs for Human Health and Ecological Risk Assessment at SWMU 8, Features 8PP and 8RR, Area of Open Burning, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-44

A-26 Nonradiological COCs for Human Health Risk Assessment at SWMU 58, Feature 58FF, Pile of Fire Bricks, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-45

LIST OF TABLES (Continued)

Table **Page**

A-27 Nonradiological COCs for Ecological Risk Assessment at SWMU 58, Feature 58FF, Pile of Fire Bricks, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-46

A-28 Nonradiological COCs for Human Health and Ecological Risk Assessment at SWMU 58, Feature 58TT, Fire Brick Area No. 2, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-47

A-29 Radiological COCs for Human Health Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value and BCF..... A-48

A-30 Radiological COCs for Ecological Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value and BCF..... A-49

A-31 Radiological COCs for Human Health Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value and BCF A-50

A-32 Radiological COCs for Ecological Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value and BCF A-51

A-33 Radiological COCs for Human Health and Ecological Risk Assessment at SWMU 8, Features 8PP and 8RR, Area of Open Burning, with Comparison to the Associated SNL/NM Background Screening Value and BCF A-52

A-34 Radiological COCs for Human Health and Ecological Risk Assessment at SWMU 58, Feature 58FF, Pile of Fire Bricks, with Comparison to the Associated SNL/NM Background Screening Value and BCF A-53

A-35 Radiological COCs for Human Health and Ecological Risk Assessment at SWMU 58, Feature 58TT, Fire Brick Area No. 2, with Comparison to the Associated SNL/NM Background Screening Value and BCF A-54

A-36 Summary of Fate and Transport at SWMUs 8 and 58 ..... A-55

A-37 Toxicological Parameter Values for SWMUs 8 and 58 Nonradiological COCs..... A-70

A-38 Toxicological Parameter Values for SWMUs 8 and 58 Radiological COCs Obtained from RESRAD Risk Coefficients A-72

LIST OF TABLES (Continued)

Table **Page**

A-39 Risk Assessment Values for Nonradiological COCs, SWMUs 8 and 58 Combination Area A-74

A-40 Risk Assessment Values for SWMUs 8 and 58 Nonradiological Background Constituents, SWMUs 8 and 58 Combination Area..... A-75

A-41 Risk Assessment Values for SWMUs 8 and 58 Nonradiological COCs, Features 8Y and 58B, Debris Pile and Pit Area A-77

A-42 Risk Assessment Values for SWMUs 8 and 58 Nonradiological Background Constituents, Features 8Y and 58B, Debris Pile and Pit Area.... A-78

A-43 Risk Assessment Values for SWMU 8 Nonradiological COCs, Features 8PP and 8RR, Area of Open Burning..... A-79

A-44 Risk Assessment Values for SWMU 8 Nonradiological Background Constituents, Features 8PP and 8RR, Area of Open Burning A-79

A-45 Risk Assessment Values for SWMU 58 Nonradiological COCs, Feature 58FF, Pile of Fire Bricks A-81

A-46 Risk Assessment Values for SWMU 58 Nonradiological Background Constituents, Feature 58FF, Pile of Fire Bricks..... A-82

A-47 Summation of Incremental Nonradiological and Radiological Risks from SWMUs 8 and 58 Combination Area A-91

A-48 Summation of Incremental Nonradiological and Radiological Risks from SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, Carcinogens..... A-92

A-49 Summation of Incremental Nonradiological and Radiological Risks from SWMU 8, Features 8PP and 8RR, Area of Open Burning Carcinogens A-93

A-50 Summation of Incremental Nonradiological and Radiological Risks from SWMU 58, Feature 58FF, Pile of Fire Bricks A-94

A-51 Summation of Incremental Nonradiological and Radiological Risks from SWMU 58, Feature 58TT, Fire Brick Area No. 2..... A-95

A-52 Exposure Factors for Ecological Receptors at SWMUs 8 and 58..... A-101

A-53 Transfer Factors Used in Exposure Models for COPECs at SWMUs 8 and 58..... A-103

LIST OF TABLES (Continued)

Table		Page
A-54	Media Concentrations for COPECs at SWMUs 8 and 58 for All Areas Evaluated	A-105
A-55	Toxicity Benchmarks for Ecological Receptors at SWMUs 8 and 58	A-107
A-56	HQs for Ecological Receptors at SWMUs 8 and 58 Combination Area	A-111
A-57	Total Dose Rates for Deer Mice Exposed to Radionuclides at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area	A-113
A-58	Total Dose Rates for Burrowing Owls Exposed to Radionuclides at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area	A-113
A-59	HQs for Ecological Receptors at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area	A-114
A-60	Total Dose Rates for Deer Mice Exposed to Radionuclides at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area	A-115
A-61	Total Dose Rates for Burrowing Owls Exposed to Radionuclides at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area	A-115
A-62	HQs for Ecological Receptors at SWMU 8, Features 8PP and 8RR, Area of Open Burning	A-116
A-63	Total Dose Rates for Deer Mice Exposed to Radionuclides at SWMU 8, Features 8PP and 8RR, Area of Open Burning	A-116
A-64	Total Dose Rates for Burrowing Owls Exposed to Radionuclides at SWMU 8, Features 8PP and 8RR, Area of Open Burning	A-116
A-65	HQs for Ecological Receptors at SWMU 58, Feature 58FF, Pile of Fire Bricks	A-118
A-66	Total Dose Rates for Deer Mice Exposed to Radionuclides at SWMU 58, Feature 58TT, Fire Brick Area No. 2	A-118
A-67	Total Dose Rates for Burrowing Owls Exposed to Radionuclides at SWMU 58, Feature 58TT, Fire Brick Area No. 2	A-119
A-68	HQs for Ecological Receptors at SWMU 58, Feature 58TT, Fire Brick Area No. 2	A-119

LIST OF TABLES (Concluded)

Table **Page**

A-69 Total Dose Rates for Deer Mice Exposed to Radionuclides at SWMU 58, Feature 58TT, Fire Brick Area No. 2 ..... A-119

A-70 Total Dose Rates for Burrowing Owls Exposed to Radionuclides at SWMU 58, Feature 58TT, Fire Brick Area No. 2 ..... A-120

LIST OF FIGURES

Figure **Page**

A-1 Conceptual Site Model Flow Diagram for SWMUs 8 and 58 Combination Area A-57

A-2 Conceptual Site Model Flow Diagram for SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area A-59

A-3 Conceptual Site Model Flow Diagram for SWMU 8, Features 8PP and 8RR, Area of Open Burning A-61

A-4 Conceptual Site Model Flow Diagram for SWMU 58, Feature 58FF, Pile of Bricks A-63

A-5 Conceptual Site Model Flow Diagram for SWMU 58, Feature 58TT, Fire Brick Area No. 2 ..... A-65

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SWMUs 8 and 58: RISK ASSESSMENT REPORT

I. Site Description and History

Solid Waste Management Units (SWMUs) 8 and 58 are located near the eastern boundary between U.S. Air Force (USAF) land and other USAF land withdrawn from the U.S. Forest Service and permitted to the U.S. Department of Energy (DOE). The sites are located north of Coyote Springs Road, approximately 2.7 miles east of the intersection of Coyote Springs and Lovelace Roads.

The elevation at SWMUs 8 and 58 ranges from approximately 5,880 to 6,280 feet above mean sea level. SWMU 8 and the central portion of SWMU 58 are generally flat with a slight slope to the south-southwest. SWMU 58 is bordered on the northwest by a ridge. A small arroyo runs from the north to the south through the western side of the site. This arroyo is a tributary of the Arroyo Del Coyote, a medium-sized arroyo that runs from east to west just south of the site. Both arroyos are dry except during and immediately following heavy storms. The average rainfall, as measured at Albuquerque International Sunport, is 8.3 inches per year (NOAA 1997). Estimates of evapotranspiration for the Kirtland Air Force Base (KAFB) area range from 95 to 99 percent of the annual rainfall (SNL/NM February 1998a).

Alluvium fills the arroyo floors and a veneer of weather bedrock (colluvium) covers the surrounding slopes. Soil types across the two sites consist of Gila sandy loam, the Tesajo-Millet gravelly loam, and the Salas Complex (clayey to gravelly loam). The soils are poorly developed and are primarily derived from greenstone, limestone, and quartzite from the Manzanita Mountains.

The vegetation at SWMUs 8 and 58 primarily consists of sparse grasses and cacti. Small juniper trees are found in small numbers. The indigenous wildlife includes reptiles, birds, small mammals, and coyotes. No threatened or endangered species have been identified in the vicinity of SWMUs 8 and 58 (IT February 1995).

SWMUs 8 and 58 are located in the Arroyo del Coyote watershed which captures runoff from the western flank of the Manzanita Mountains. No surface-water bodies are located at either site. The nearest surface water is Coyote Springs, a perennial spring located approximately 1,400 feet southwest of SWMU 58 on Arroyo del Coyote. Arroyo del Coyote intersects Tijeras Arroyo approximately 7 miles west of the two sites. Tijeras Arroyo eventually drains into the Rio Grande, approximately 16 miles west of the two sites. Surface-water samples are routinely collected at monitoring station MP-06, which is located 1.1 miles southwest of SWMU 58 (SNL/NM September 2003).

No regulatory compliance issues concerning groundwater or surface water specifically apply to either SWMUs 8 or 58. Groundwater studies for the area are routinely presented in the “Annual Groundwater Monitoring Report” (SNL/NM April 2004). The nearest downgradient monitoring well, Greystone MW-2, is located approximately 3,200 feet southwest of SWMU 58. In April 2002, Greystone MW-2 was installed as a replacement well for the old homestead Greystone Manor Well. Because of declining water levels and a severely corroded well casing, the Greystone Manor Well was plugged and abandoned in September 2002. Greystone MW-2 was screened in Quaternary alluvium at a depth of 60 to 80 feet below ground surface (bgs). In

March 2003, the depth to water at Greystone MW-2 was 51 feet bgs. The nearest water-supply well used for drinking water is KAFB-11, which is located approximately 3.6 miles northwest of SWMU 58.

More than a hundred tests have taken place at SWMUs 8 and 58, and test debris and fixtures remain at numerous locations. Neither site is currently being used for test activities. From 1950 to the late 1960s, at various locations within SWMU 58, numerous Sandia National Laboratories/New Mexico (SNL/NM) research groups conducted tests involving at-ground or aboveground explosive detonations. Penetration tests commenced after this time but did not involve any hazardous materials.

Prior to the penetration tests, the primary materials dispersed at the sites were metals and radionuclides. Emissions from the combustion of explosives would have been primarily gaseous and would have dissipated. Solid residues may have been produced by explosives containing metals, such as barium from Baratol. Carbon tetrachloride was alleged to have been poured into the Underground Conduit System (SWMUs 58AA and 58BB) to displace water before the tests were performed. Jet propellant, grade 4 fuel was released to the ground during burn tests. Metals also were dispersed during some tests. Asbestos-containing material was found at various locations scattered throughout SWMUs 8 and 58. Gaseous argon was released during the HALO experiments and readily dispersed into the atmosphere during the testing.

Debris from the SWMU 58 tests and possibly debris from other sources was disposed of at SWMU 8. Documented tests at SWMU 58 involved large quantities of bulk explosives, which were typically shipped in wooden crates. These wooden crates, along with scrap metals from the tests, comprised most of the solid waste found at SWMU 8.

SWMU 8 and portions of SWMU 58 are located within the Manzano Combat Range, an area where KAFB military training is periodically conducted. Most of the unexploded ordnance occasionally found on site results from this ongoing activity rather than past SNL/NM research activities.

II. Data Quality Objectives

The data quality objectives (DQOs) for SWMUs 8 and 58 were presented in the “RCRA [Resource Conservation and Recovery Act] Facility Investigation [RFI] Work Plan for Operable Unit 1332, Foothills Test Area” (SNL/NM June 1995) and multiple Voluntary Corrective Action/ Voluntary Corrective Measure plans for these sites (SNL/NM August 1998, SNL/NM October 2000, SNL/NM January 2004). These plans identified the site-specific confirmatory locations, sample depths, sampling procedures, and analytical requirements. The DQOs also outlined the quality assurance (QA)/quality control (QC) requirements necessary for producing defensible analytical data suitable for risk assessment purposes.

In response to the New Mexico Environment Department's (NMED) verbal request concerning risk assessments (Mignardot October 2004), the analytical results are organized according to five conceptual site models developed for the following areas:

- SWMUs 8 and 58 Combination Area
- SWMUs 8 and 58, Features 8Y and 58B—Debris Pile and Pit Area
- SWMU 8, Features 8PP and 8RR—Area of Open Burning
- SWMU 58, Feature 58FF—Pile of Fire Bricks
- SWMU 58, Feature 58TT—Fire Brick Area No. 2

The DQOs for each area evaluated are discussed in the following sections.

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II.1 Data Quality Objectives for SWMUs 8 and 58 Combination Area

As shown in Table A-1, multiple confirmatory sampling events provide the analytical data relevant to the SWMUs 8 and 58 Combination area. Sample locations, depth ranges, and collection techniques are also listed in Table A-1.

Highlights of the analytical results for the SWMUs 8 and 58 Combination area include the following detections:

- The following 12 metals were detected at levels above background concentrations:
  - Arsenic
  - Barium
  - Beryllium
  - Cadmium
  - Chromium
  - Copper
  - Lead
  - Mercury
  - Nickel
  - Selenium
  - Silver
  - Zinc
- The following five radionuclides were detected above background activity levels:
  - Cs-137
  - H-3
  - Th-232
  - U-235
  - U-238
- The following five high explosive (HE) compounds were detected:
  - 2-amino-4,6-Dinitrotoluene
  - 4-amino-2,6-Dinitrotoluene
  - Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
  - Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
  - 2,4,6-Trinitrotoluene
- The following seven volatile organic compounds (VOCs) were detected:
  - Acetone
  - 2-Butanone
  - Chloroform

Table A-1
Soil Sampling Locations for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Event	Date Performed	Number of Soil Sample Locations	Sample Depth Range (ft bgs)	Collection Technique
8Y/58B	RFI Subsurface Soil Sampling (58B Pit)	1996	1 (borehole)	0.0–1 5–6	Split-spoon sampler
		1999	1 (borehole)	5,10,15,20	Split-spoon sampler
8Y/58B	VCM Soil Sampling	1998–1999	16	0.0–0.5	HT
58E	RFI Soil Sampling	1996–1997	8	0.0–0.5	HT
58E	RFI Subsurface (Trench) Soil Sampling	1996	15	1–14.5	Trenching/HT
58F	RFI Soil Sampling	1996–1997	17	0.0–0.5	HT
58G	RFI Soil Sampling	1996	7	0.0–0.5	HT
58H	RFI Soil Sampling	1996–1997	17	0.0–0.5	HT
58I	RFI Soil Sampling	1996–1997	19	0.0–0.5	HT
58I	RFI Subsurface Soil Sampling	1996	1 (borehole)	0–1.5	Split-spoon sampler
58J	RFI Soil Sampling	1998	9	0.0–0.5	HT
58L	RFI Soil Sampling	1998	9	0.0–0.5	HT
58O	RFI Soil Sampling	1996–1997	16	0.0–0.5	HT
58O	RFI Subsurface Soil Sampling	1996	1 (borehole)	0–11	Split-spoon sampler
58S	RFI Soil Sampling	1997	17	0.0–0.5	HT
58U	RFI Soil Sampling	1996–1997	17	0.0–0.5	HT
58X	RFI Soil Sampling	1996	17	0.0–0.5	HT
58Z	RFI Soil Sampling	1996	17	0.0–0.5	HT
58Z	RFI Subsurface Soil Sampling	1996	1 (borehole)	0–10	Split-spoon sampler
58FF	RFI Soil Sampling	1995	4	0.0–0.5	HT
		1999	13	0.0–0.5	HT
58FF	RFI Subsurface Soil Sampling	1996	1 (borehole)	0.0–20	Split-spoon sampler
		1996	6 (borehole)	5–29	Split-spoon sampler
		1997	7 (borehole)	10–50	Split-spoon sampler
58OO	RFI Subsurface Soil Sampling	1997	1 (borehole)	0–65	Split-spoon sampler
58PP/RR	VCM Soil Sampling	2004	10	0.0–0.5	HT
58SS	RFI Subsurface Soil Sampling	1999	1 (borehole)	6.0–15.0	Split-spoon sampler
58TT	VCM Soil Sampling	1999	6	0.0–0.5	HT
58UU	RFI Soil Sampling	1999–2000	12	0.0–0.5	HT

Refer to footnotes at end of table.

Table A-1 (Concluded)
Soil Sampling Locations for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Event	Date Performed	Number of Soil Sample Locations	Sample Depth Range (ft bgs)	Collection Technique
58VV	RFI Soil Sampling	1999	2	0.0–0.5	HT
58WW	RFI Soil Sampling	1999	1	0.0–0.5	HT
58XX	RFI Soil Sampling	1999	1	0.0–0.5	HT
58YY	RFI Soil Sampling	1999	1	0.0–0.5	HT
58ZZ	RFI Subsurface Soil Sampling	1999	1 (borehole)	3.0–7.5	Split-spoon sampler
58AAA	RFI Soil Sampling	1999	1	0.0–0.5	HT
58CCC	RFI Soil Sampling	1996	4	0.0–0.5	HT
58CCC	RFI Subsurface (Trench) Soil Sampling	1996	2	3–3.5	Trenching/HT
8DDD	RFI Soil Sampling	1995, 1998	14	0.0–0.5	HT
8GGG	RFI Soil Sampling	1996, 1998	10	0.0–0.5	HT
UCS 58K, 58W, 58BB, 58AAA, 58EEE, 58FFF	RFI Subsurface Soil Sampling	1996	5 (manhole)	4–4.5	HT
		1996	22 (borehole)	3.7–15.7	Split-spoon sampler
UCS 58K, 58W, 58BB, 58AAA, 58EEE, 58FFF	VCA Subsurface Soil Sampling	2000	10	2–5	HT

bgs = Below ground surface.
ft = Foot (feet).
HT = Hand trowel.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
UCS = Underground Conduit System.
VCA = Voluntary Corrective Action.
VCM = Voluntary Corrective Measure.

  - Ethylbenzene
  - 2-Hexanone
  - Methylene chloride
  - Toluene

- The following 11 semivolatile organic compounds (SVOCs) were detected:

  - Benzo(a)pyrene
  - Benzo(b)anthracene
  - Chrysene
  - Diethyl phthalate
  - m-Dinitrobenzene
  - 2,4-Dinitrotoluene
  - bis(2-Ethylhexyl) phthalate
  - Fluoranthene
  - n-Nitrosodiphenylamine
  - Pentachlorophenol
  - Pyrene

Table A-2 presents the analytes and corresponding analytical laboratory that performed the analyses for each sampling event concerning the SWMUs 8 and 58 Combination area.

A total of 1,285 analyses are applicable to the SWMUs 8 and 58 Combination area (Table A-3). As shown in Table A-3, the QA/QC analyses consisted of 82 duplicates, 104 equipment blanks, and 27 VOC trip blanks. For each of the sampling events, the duplicate soil samples were collected at ratios complying with the Environmental Restoration (ER) Project Quality Assurance Project Plan. The aqueous VOC trip blanks were supplied by the off-site analytical laboratory. The equipment (aqueous rinsate) blanks were prepared in the field as part of the sampling effort. No significant QA/QC problems were identified in the analyses for the duplicate, equipment blank, or VOC trip blank samples.

Table A-4 summarizes the analytical methods and data quality requirements for the SWMUs 8 and 58 Combination area. The confirmatory analytical data were reviewed and verified/validated according to “Data Validation Procedure for Chemical and Radiochemical Data,” SNL/NM ER Project Administrative Operating Procedure (AOP) 00-03 (SNL/NM December 1999). In addition, the Radiation Protection Sample Diagnostics (RPSD) Laboratory reviewed all gamma spectroscopy results according to “Laboratory Data Review Guidelines,” Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996). The reviews confirmed that the analytical data are defensible and therefore acceptable for use in the request for a determination of Corrective Action Complete (CAC) without controls. Therefore, the DQOs have been fulfilled.

Table A-2
Analytes and Analytical Laboratories for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Event	Number of Soil Sample Locations	Analytes	Laboratory
8Y/58B	RFI Subsurface Soil Sampling (58B Pit)	2 (borehole)	Metals, HE, VOCs, SVOCs, TPH, Gamma Spectroscopy, H-3	GEL, RPSD
8Y/58B	VCM Soil Sampling	16 (surface)	Metals, HE, Gamma Spectroscopy, total uranium, H-3	GEL, CORE, RPSD
58E	RFI Soil Sampling	8	Metals, Gamma Spectroscopy	GEL, RPSD, ERCL
58E	RFI Subsurface (Trench) Soil Sampling	15	Metals	GEL, RPSD
58F	RFI Soil Sampling	17	Metals, HE, Gamma Spectroscopy, Alpha Spectroscopy	GEL, RPSD, ERCL
58G	RFI Soil Sampling	7 (surface)	Metals, Gamma Spectroscopy	GEL, RPSD
58H	RFI Soil Sampling	17	Metals, HE, Gamma Spectroscopy, Alpha Spectroscopy	GEL, RPSD, ERCL
58I	RFI Soil Sampling	19 (surface)	VOCs, SVOCs, TPH	GEL, ERCL
		1 (borehole)	VOCs, SVOCs, TPH	GEL
58J	RFI Soil Sampling	9 (surface)	HE, Gamma Spectroscopy	GEL, RPSD
58L	RFI Soil Sampling	9 (surface)	HE, Gamma Spectroscopy	GEL, RPSD
58O	RFI Soil Sampling	16 (surface)	Metals, HE, VOCs, SVOCs, TPH	GEL, ERCL
		1 (borehole)	Metals, HE, VOCs, SVOCs, TPH	GEL
58S	RFI Soil Sampling	17	HE, Gamma Spectroscopy	GEL, RPSD
58U	RFI Soil Sampling	17	Metals, HE, Gamma Spectroscopy, Alpha Spectroscopy, Gross Alpha/Beta Activity	GEL, RPSD, ERCL

Refer to footnotes at end of table.

Table A-2 (Continued)
Analytes and Analytical Laboratories for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Event	Number of Soil Sample Locations	Analytes	Laboratory
58X	RFI Soil Sampling	17	HE, Gamma Spectroscopy, Alpha Spectroscopy	GEL, RPSD
58Z	RFI Soil Sampling	17 (surface)	HE, Gamma Spectroscopy	GEL, LAS
		1 (borehole)	HE	GEL
58FF	RFI Soil Sampling	17 (surface)	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy	GEL, LAS, RPSD, ERCL
		14 (borehole)	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy	GEL, RPSD
58OO	RFI Soil Sampling	1 (borehole)	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy, Gross Alpha/Beta Activity	GEL, RPSD
58PP/RR	VCM Soil Sampling	10 (surface)	Metals, Gamma Spectroscopy	GEL, RPSD
58SS	RFI Soil Sampling	1 (borehole)	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy	GEL, RPSD
58TT	VCM Soil Sampling	6 (surface)	Metals, HE, Gamma Spectroscopy	GEL, RPSD
58UU	RFI Soil Sampling	12 (surface)	Metals, Gamma Spectroscopy	GEL, RPSD
58VV	RFI Soil Sampling	2 (surface)	Metals, Gamma Spectroscopy	GEL, RPSD
58WW	RFI Soil Sampling	1 (surface)	Metals, HE, Gamma Spectroscopy	GEL, RPSD
58XX	RFI Soil Sampling	1 (surface)	Metals, HE, Gamma Spectroscopy	GEL, RPSD
58YY	RFI Soil Sampling	1 (surface)	Metals, HE, Gamma Spectroscopy	GEL, RPSD
58ZZ	RFI Soil Sampling	1 (borehole)	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy	GEL, RPSD
58AAA	RFI Soil Sampling	1 (beneath gravel at bottom of pit)	Metals, HE, VOCs, SVOCs, TPH, Gamma Spectroscopy	GEL, RPSD

Refer to footnotes at end of table.

Table A-2 (Concluded)
Analytes and Analytical Laboratories for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Event	Number of Soil Sample Locations	Analytes	Laboratory
58CCC	RFI Soil Sampling	4 (surface)	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy	GEL, RPSD
58CCC	RFI Subsurface (Trench) Soil Sampling	2	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy	GEL, RPSD
58DDD	RFI Soil Sampling	14 (surface)	Metals, Gamma Spectroscopy, HE	GEL, RPSD, ERCL, LAS
58GGG	RFI Soil Sampling	10 (surface)	Metals, Gamma Spectroscopy, HE	GEL, RPSD, ERCL
UCS 58K, 58W, 58AA, 58BB, 58EEE, 58FFF	RFI Subsurface Soil Sampling	5 (manhole)	VOCs, Gamma Spectroscopy	GEL, RPSD
		22 (borehole)	VOCs, Gamma Spectroscopy	GEL, RPSD
UCS 58K, 58W, 58AA, 58BB, 58EEE, 58FFF	VCA Soil Sampling	10 (surface)	Metals, VOCs, Gamma Spectroscopy	GEL, RPSD

ERCL = Environmental Restoration Chemistry Laboratory.
GEL = General Engineering Laboratories, Inc.
HE = High explosive(s).
LAS = Lockheed Analytical Services.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.
UCS = Underground Conduit System.
VCA = Voluntary Corrective Action.
VCM = Voluntary Corrective Measure.
VOC = Volatile organic compound.

Table A-3
Number of Analyses for Soil Samples Collected for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Type	Metals	VOCs	SVOCs	TPH	HE	Radionuclides	Number of Analyses
8Y/58B	Soil	22	6	6	6	19	20/15[a]	94
	Duplicate	2	1	1	1	1	1[a]	7
	Equipment Blank	2	2	2	1	1	1[a]	9
	VOC Trip Blank	–	3	–	–	–	–	3
58E	Soil	23	–	–	–	–	1	24
	Duplicate	3	–	–	–	–	0	3
	Equipment Blank	3	–	–	–	–	0	3
58F	Soil	17	–	–	–	17	17	51
	Duplicate	2	–	–	–	1	1	4
	Equipment Blank	3	–	–	–	1	2	6
58G	Soil	7	–	–	–	–	7	14
	Duplicate	1	–	–	–	–	0	1
	Equipment Blank	1	–	–	–	–	1	2
58H	Soil	17	–	–	–	17	17	51
	Duplicate	2	–	–	–	0	1	3
	Equipment Blank	2	–	–	–	0	2	4
58I	Soil	–	20	20	20	–	–	60
	Duplicate	–	3	2	3	–	–	8
	Equipment Blank	–	3	2	3	–	–	8
	VOC Trip Blank	–	5	–	–	–	–	5
58J	Soil	–	–	–	–	9	9	18
	Duplicate	–	–	–	–	1	0	1
	Equipment Blank	–	–	–	–	1	0	1
58L	Soil	–	–	–	–	9	9	18
	Duplicate	–	–	–	–	1	0	1
	Equipment Blank	–	–	–	–	1	0	1
58O	Soil	19	19	19	19	19	–	95
	Duplicate	2	2	2	2	1	–	9
	Equipment Blank	3	1	1	1	1	–	7
	VOC Trip Blank	–	2	–	–	–	–	2

Refer to footnotes at end of table.

Table A-3 (Continued)
Number of Analyses for Soil Samples Collected for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Type	Metals	VOCs	SVOCs	TPH	HE	Radionuclides	Number of Analyses
58S	Soil	–	–	–	–	17	17	34
	Duplicate	–	–	–	–	1	1	2
	Equipment Blank	–	–	–	–	1	1	2
58U	Soil	17	–	–	–	17	17	51
	Duplicate	2	–	–	–	1	1	4
	Equipment Blank	2	–	–	–	1	3	6
58X	Soil	–	–	–	–	17	17	34
	Duplicate	–	–	–	–	1	0	1
	Equipment Blank	–	–	–	–	1	1	2
58Z	Soil	–	–	–	–	20	17	37
	Duplicate	–	–	–	–	1	0	1
	Equipment Blank	–	–	–	–	1	0	1
58FF	Soil	87	21	21	–	21	45	195
	Duplicate	4	1	1	–	3	1	10
	Equipment Blank	4	1	1	–	1	0	7
	VOC Trip Blank	–	1	–	–	–	–	1
58OO	Soil	6	6	6	–	6	2	26
	Duplicate	1	0	0	–	0	0	1
	Equipment Blank	1	1	1	–	1	0	4
	VOC Trip Blank	–	0	–	–	–	–	0
58PP/RR	Soil	10	–	–	–	–	10	20
	Duplicate	1	–	–	–	–	1	2
	Equipment Blank	1	–	–	–	–	0	1
58SS	Soil	3	3	3	–	3	3	15
	Duplicate	1	1	0	–	0	1	3
	Equipment Blank	0	1	0	–	0	0	1
	VOC Trip Blank	–	1	–	–	–	–	1
58TT	Soil	6	–	–	–	6	6	18
	Duplicate	1	–	–	–	–	1	2
58UU	Soil	12	–	–	–	–	12	24
	Duplicate	1	–	–	–	–	1	2
	Equipment Blank	0	–	–	–	–	0	0

Refer to footnotes at end of table.

Table A-3 (Continued)
Number of Analyses for Soil Samples Collected for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Type	Metals	VOCs	SVOCs	TPH	HE	Radionuclides	Number of Analyses
58VV	Soil	2	–	–	–	–	2	4
	Duplicate	0	–	–	–	–	0	0
	Equipment Blank	0	–	–	–	–	0	0
58WW	Soil	1	–	–	–	1	1	3
	Duplicate	0	–	–	–	0	0	0
	Equipment Blank	0	–	–	–	0	0	0
58XX	Soil	1	–	–	–	1	1	3
	Duplicate	0	–	–	–	0	0	0
	Equipment Blank	0	–	–	–	0	0	0
58YY	Soil	1	–	–	–	1	1	3
	Duplicate	0	–	–	–	0	0	0
	Equipment Blank	0	–	–	–	0	0	0
58ZZ	Soil	3	3	3	–	3	3	15
	Duplicate	0	0	0	–	0	0	0
	Equipment Blank	0	1	0	–	0	0	1
	VOC Trip Blank	–	1	–	–	–	–	1
58AAA	Soil	1	1	1	1	1	1	6
	Duplicate	1	1	1	1	1	1	6
	Equipment Blank	0	1	1	1	1	0	4
	VOC Trip Blank	–	1	–	–	–	–	1
58CCC	Soil	6	6	6	–	6	6	30
	Duplicate	1	1	1	–	1	0	4
	Equipment Blank	1	1	1	–	1	0	4
	VOC Trip Blank	–	1	–	–	–	–	1
8DDD	Soil	14	–	–	–	–	14	28
	Duplicate	1	–	–	–	–	0	1
	Equipment Blank	1	–	–	–	–	0	1
8GGG	Soil	10	–	–	–	10	6	26
	Duplicate	1	–	–	–	–	1	2
	Equipment Blank	2	–	–	–	–	0	2

Refer to footnotes at end of table.

Table A-3 (Concluded)
Number of Analyses for Soil Samples Collected for SWMUs 8 and 58 Combination Area

Feature Location	Sampling Type	Metals	VOCs	SVOCs	TPH	HE	Radionuclides	Number of Analyses
UCS 58K, 58W, 58AA, 58BB, 58EEE, 58FFF	Soil	10	59	–	–	–	22	91
	Duplicate	1	5	–	–	–	0	6
	Equipment Blank	7	11	–	–	–	0	18
	VOC Trip Blank	–	12	–	–	–	–	12
Total Samples		356	209	102	59	247	341	1,294

[a]H-3 analysis performed only.
HE = High explosive(s).
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.
UCS = Underground Conduit System.
VOC = Volatile organic compound.
– = Not applicable.

Table A-4
Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58 Combination Area

Feature Location	Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b,c]	Analyses from On-Site Laboratory[c,d]
58E	Metals EPA Method 6010/7000	Defensible	3	23
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	23
58F	Metals EPA Method 6010/7000	Defensible	12	7
	HE EPA Method 8330	Defensible	18	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	18
	Alpha Spectroscopy Method HASL 300 (Isotopic thorium and gamma spectroscopy) and EPI A-011 (Isotopic uranium)	Defensible	6	0
58G	Metals EPA Method 6010/7000	Defensible	8	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	7
58H	Metals EPA Method 6010/7000	Defensible	12	7
	HE EPA Method 8330	Defensible	17	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	18
	Alpha Spectroscopy Method HASL 300 (Isotopic thorium and gamma spectroscopy) and EPI A-011 (Isotopic uranium)	Defensible	6	0
58I	VOCs EPA Method 8260	Defensible	13	10
	SVOCs EPA Method 8270	Defensible	13	9
	TPH EPA Method 8015	Defensible	13	10
58J	HE EPA Method 8330	Defensible	10	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	9
58L	HE EPA Method 8330	Defensible	10	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	9

Refer to footnotes at end of table.

Table A-4 (Continued)
Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58 Combination Area

Feature Location	Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b,c]	Analyses from On-Site Laboratory[c,d]
58O	Metals EPA Method 6010/7000	Defensible	13	8
	HE EPA Method 8330	Defensible	12	8
	VOCs EPA Method 8260	Defensible	13	8
	SVOCs EPA Method 8270	Defensible	13	8
	TPH EPA Method 8015	Defensible	13	8
58S	HE EPA Method 8330	Defensible	18	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	18
58U	Metals EPA Method 6010/7000	Defensible	13	6
	HE EPA Method 8330	Defensible	18	0
	Radionuclides EPA Method 906.0 (H-3)	Defensible	5	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	18
	Alpha Spectroscopy Method HASL 300 (Isotopic thorium and gamma spectroscopy) and EPI A-011 (Isotopic uranium)	Defensible	5	0
58X	HE EPA Method 8330	Defensible	18	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	17
	Alpha Spectroscopy Method HASL 300 (Isotopic thorium and gamma spectroscopy) and EPI A-011 (Isotopic uranium)	Defensible	4	0
58Z	HE EPA Method 8330	Defensible	21	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	17

Refer to footnotes at end of table.

Table A-4 (Continued)
Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58 Combination Area

Feature Location	Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b,c]	Analyses from On-Site Laboratory[c,d]
58OO	Metals EPA Method 6010/7000	Defensible	7	0
	HE EPA Method 8330	Defensible	6	0
	VOCs EPA Method 8260	Defensible	6	0
	SVOCs EPA Method 8270	Defensible	6	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	2
	Alpha Spectroscopy Method HASL 300 (Isotopic thorium and gamma spectroscopy) and EPI A-011 (Isotopic uranium)	Defensible	0	2
58SS	Metals EPA Method 6010/7000	Defensible	4	0
	HE EPA Method 8330	Defensible	3	0
	VOCs EPA Method 8260	Defensible	4	0
	SVOCs EPA Method 8270	Defensible	3	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	4
58UU	Metals EPA Method 6010/7000	Defensible	13	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	13
58VV	Metals EPA Method 6010/7000	Defensible	2	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	2
58WW	Metals EPA Method 6010/7000	Defensible	1	0
	HE EPA Method 8330	Defensible	1	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	1
58XX	Metals EPA Method 6010/7000	Defensible	1	0
	HE EPA Method 8330	Defensible	1	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	1

Refer to footnotes at end of table.

Table A-4 (Continued)
Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58 Combination Area

Feature Location	Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b,c]	Analyses from On-Site Laboratory[c,d]
58YY	Metals EPA Method 6010/7000	Defensible	1	0
	HE EPA Method 8330	Defensible	1	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	1
58ZZ	Metals EPA Method 6010/7000	Defensible	3	0
	HE EPA Method 8330	Defensible	3	0
	VOCs EPA Method 8260	Defensible	3	0
	SVOCs EPA Method 8270	Defensible	3	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	3
58AAA	Metals EPA Method 6010/7000	Defensible	2	0
	HE EPA Method 8330	Defensible	2	0
	VOCs EPA Method 8260	Defensible	2	0
	SVOCs EPA Method 8270	Defensible	2	0
	TPH EPA Method 8015	Defensible	2	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	2
58CCC	Metals EPA Method 6010/7000	Defensible	7	0
	HE EPA Method 8330	Defensible	7	0
	VOCs EPA Method 8260	Defensible	7	0
	SVOCs EPA Method 8270	Defensible	7	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	6
8DDD	Metals EPA Method 6010/7000	Defensible	15	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	14
	HE EPA Method 8330	Defensible	15	0

Refer to footnotes at end of table.

Table A-4 (Continued)
Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58 Combination Area

Feature Location	Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b,c]	Analyses from On-Site Laboratory[c,d]
8GGG	Metals EPA Method 6010/7000	Defensible	11	0
	HE EPA Method 8330	Defensible	7	4
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	7
UCS–58K, 58W, 58AA, 58BB, 58EEE, 58FFF	Metals EPA Method 6010/7000	Defensible	11	0
	VOCs EPA Method 8260	Defensible	64	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	22
8Y/58B	Metals EPA Method 6010/7000	Defensible	24	21
	HE EPA Method 8330	Defensible	20	0
	VOCs EPA Method 8260	Defensible	7	0
	SVOCs EPA Method 8270	Defensible	7	0
	TPH EPA Method 8015	Defensible	7	0
	Radionuclides EPA Method 906.0 (H-3)	Defensible	0	16
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	20
8PP/RR	Metals EPA Method 6010/7000	Defensible	11	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	11
58FF	Metals EPA Method 6010/7000	Defensible	91	0
	HE EPA Method 8330	Defensible	24	0
	VOCs EPA Method 8260	Defensible	22	0
	SVOCs EPA Method 8270	Defensible	22	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	46

Refer to footnotes at end of table.

Table A-4 (Concluded)
Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58 Combination Area

Feature Location	Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b,c]	Analyses from On-Site Laboratory[c,d]
58TT	Metals EPA Method 6010/7000	Defensible	7	0
	HE EPA Method 8330	Defensible	6	0
	Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	7

[a]EPA Methods from EPA (November 1986).
[b]GEL, CORE, Inc., and LAS provided the off-site analyses.
[c]Includes duplicate samples, but not other QA/QC samples such as equipment blanks or trip blanks.
[d]RPSD and ERCL Laboratory provided the on-site analyses.
EPA = U.S. Environmental Protection Agency.
ERCL = Environmental Restoration Chemistry Laboratory.
GEL = General Engineering Laboratories, Inc.
HASL = Health and Safety Lab Manual.
HE = High explosive(s).
LAS = Lockheed Analytical Services.
QA = Quality assurance.
QC = Quality control.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.
UCS = Underground Conduit System.
VOC = Volatile organic compound.

II.2 Data Quality Objectives for SWMUs 8 and 58, Features 8Y and 58B—Debris Pile and Pit Area

As shown in Table A-5, RFI and confirmatory sampling events provide the analytical data relevant to Features 8Y and 58B, Debris Pile and Pit Area. Sample locations, depth ranges, and collection techniques are also listed in Table A-5.

Table A-5
Soil Sampling Locations for SWMUs 8 and 58,
Features 8Y and 58B, Debris Pile and Pit Area

Sampling Event	Date Performed	Number of Soil Sample Locations	Sample Depth Range (ft bgs)	Collection Technique
RFI Subsurface Soil Sampling (58B Pit)	1996	1 (borehole)	0.0–1 5–6	Split-spoon sampler
	1999	1 (borehole)	5,10,15,20	Split-spoon sampler
VCM Soil Sampling	1998–1999	16	0.0–0.5	HT

bgs = Below ground surface.
ft = Foot (feet).
HT = Hand trowel.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

Highlights of the analytical results for Features 8Y and 58B, Debris Pile and Pit area include the following detections:

- The following eight metals were detected at levels above background concentrations:
  - Cadmium
  - Chromium
  - Copper
  - Lead
  - Mercury
  - Nickel
  - Silver
  - Zinc
- The following two radionuclides were detected above background activity:
  - H-3
  - U-235

- The following five HE compounds were detected:
  - 2-amino-4,6-Dinitrotoluene
  - 4-amino-2,6-Dinitrotoluene
  - HMX
  - RDX
  - 2,4,6-Trinitrotoluene
- The following three VOCs were detected:
  - 2-Butanone
  - Methylene chloride
  - Toluene
- The following two SVOCs were detected:
  - Diethyl phthalate
  - bis(2-Ethylhexyl) phthalate

Table A-6 presents the analytes and corresponding analytical laboratory that performed the analyses for each sampling event concerning Features 8Y and 58B, Debris Pile and Pit area.

Table A-6
Analytes and Analytical Laboratories for SWMUs 8 and 58,
Features 8Yand 58B, Debris Pile and Pit Area

Sampling Event	Number of Soil Sample Locations	Analytes	Laboratory
RFI Subsurface Soil Sampling (58B Pit)	2 (borehole)	Metals, HE, VOCs, SVOCs, TPH, Gamma Spectroscopy, H-3	GEL, RPSD
VCM Soil Sampling	16 (surface)	Metals, HE, H-3, total uranium Gamma Spectroscopy	GEL, CORE, RPSD

GEL = General Engineering Laboratories, Inc.
HE = High explosive(s).
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.
VCM = Voluntary Corrective Measure.
VOC = Volatile organic compound.

A total of 113 analyses are applicable to Features 8Y and 58B, Debris Pile and Pit area (Table A-7). As shown in Table A-7, the QA/QC analyses consisted of seven duplicates, nine equipment blanks, and three VOC trip blanks. For each of the sampling events, the duplicate soil samples were collected at ratios complying with the ER Project Quality Assurance Project Plan. The aqueous VOC trip blanks were supplied by the off-site analytical laboratory. The equipment (aqueous rinsate) blanks were prepared in the field as part of the sampling effort. No significant QA/QC problems were identified in the analyses for the duplicate, equipment blank, or VOC trip blank samples.

Table A-7
Number of Analyses for Soil Samples Collected for SWMUs 8 and 58, Features 8Y and 58B—Debris Pile and Pit Area

Sampling Type	Metals	VOCs	SVOCs	HE	TPH	Radionuclides	Number of Analyses
Soil	22	6	6	19	6	20/15[a]	94
Duplicate	2	1	1	1	1	1[a]	7
Equipment Blank	2	2	2	1	1	1[a]	9
VOC Trip Blank	–	3	–	–	–	–	3
Total Samples	26	12	9	21	8	37	113

[a]H-3 analysis performed only.
HE = High explosive(s)
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.
VOC = Volatile organic compound.
– = Not applicable.

Table A-8 summarizes the analytical methods and data quality requirements for Features 8Y and 58B, Debris Pile and Pit area. The confirmatory analytical data were reviewed and verified/validated according to "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03 (SNL/NM December 1999). In addition, the RPSD Laboratory reviewed all gamma spectroscopy results according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996).

Table A-8
Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI and Confirmatory Soil Samples for SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area

Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b]	Analyses from On-Site Laboratory[c]
Metals EPA Method 6010/7000	Defensible	24	21
HE EPA Method 8330	Defensible	20	0
TPH EPA Method 8015	Defensible	7	0
VOCs EPA Method 8260	Defensible	7	0
SVOCs EPA Method 8270	Defensible	7	0
Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	20
Radionuclides EPA Method 906.0 (H-3)	Defensible	0	16
Total number of analyses[d]		65	57

[a]EPA Methods from EPA (November 1986).
[b]GEL and CORE, Inc. provided the off-site analyses.
[c]RPSD Laboratory provided the on-site analyses.
[d]Includes duplicate samples, but not other QA/QC samples such as equipment blanks or trip blanks.
EPA = U.S. Environmental Protection Agency.
GEL = General Engineering Laboratories, Inc.
HASL = Health and Safety Lab Manual.
HE = High explosive(s).
QA = Quality assurance.
QC = Quality control.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
TPH = Total petroleum hydrocarbons.
VOC = Volatile organic compound.

II.3 Data Quality Objectives for SWMU 8, Features 8PP and 8RR—Area of Open Burning

As shown in Table A-9, one confirmatory sampling event provides the analytical data relevant to Features 8PP and 8RR, Area of Open Burning. Sample locations, depth ranges, and collection techniques are also listed in Table A-9.

Table A-9
Soil Sampling Locations for SWMU 8,
Features 8PPand 8RR, Area of Open Burning

Sampling Event	Date Performed	Number of Soil Sample Locations	Sample Depth Range (ft bgs)	Collection Technique
VCM Soil Sampling	2004	10	0.0–0.5	HT

bgs = Below ground surface.
ft = Foot (feet).
HT = Hand trowel.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

Highlights of the analytical results for Features 8PP and 8RR, Area of Open Burning include the following:

- One metal, selenium, was detected at a level above the background concentration.
- The following two radionuclides were detected above background activity:
  - Th-232
  - U-235
- No HE compounds, VOCs, or SVOCs were detected.

Table A-10 presents the analytes and corresponding analytical laboratory that performed the analyses for each sampling event concerning Features 8PP and 8RR, Area of Open Burning.

Table A-10
Analytes and Analytical Laboratories for SWMU 8,
Features 8PP and 8RR, Area of Open Burning

Sampling Event	Number of Soil Sample Locations	Analytes	Laboratories
VCM Soil Sampling	10 (surface)	Metals, Gamma Spectroscopy	GEL, RPSD

GEL = General Engineering Laboratories, Inc.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

A total of 23 analyses are applicable to Features 8PP and 8RR, Area of Open Burning (Table A-11). As shown in Table A-11, the QA/QC analyses consisted of two duplicates and one equipment blank. For the sampling event, the duplicate soil samples were collected at ratios complying with the ER Project Quality Assurance Project Plan. The equipment (aqueous rinsate) blank was prepared in the field as part of the sampling effort. No significant QA/QC problems were identified in the analyses for the duplicate or equipment blank.

Table A-11
Number of Analyses for Soil Samples Collected for SWMU 8,
Features 8PP and 8RR, Area of Open Burning

Sampling Type	Metals	Radionuclides	Number of Analyses
Soil	10	10	20
Duplicate	1	1	2
Equipment Blank	1	0	1
Total Samples	12	11	23

SWMU = Solid Waste Management Unit.

Table A-12 summarizes the analytical methods and data quality requirements for Features 8PP and 8RR, Area of Open Burning. The confirmatory analytical data were reviewed and verified/validated according to "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03 (SNL/NM December 1999). In addition, RPSD Laboratory reviewed all gamma spectroscopy results according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996).

Table A-12
Summary of Data Quality Requirements and Total Number of Analyses
(Off- and On-Site) for Confirmatory Soil Samples for SWMU 8,
Features 8PP and 8RR, Area of Open Burning

Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b]	Analyses from On-Site Laboratory[c]
Metals EPA Method 6010/7000	Defensible	11	0
Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	11
Total number of analyses[d]		11	11

[a]EPA Methods from EPA (November 1986).
[b]GEL provided the off-site analyses.
[c]RPSD Laboratory provided the on-site analyses.
[d]Includes duplicate samples, but not other QA/QC samples such as equipment blanks or VOC trip blanks.
EPA = U.S. Environmental Protection Agency.
GEL = General Engineering Laboratories, Inc.
HASL = Health and Safety Lab Manual.
QA = Quality assurance.
QC = Quality control.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

II.4 Data Quality Objectives for SWMU 58, Feature 58FF—Pile of Fire Bricks

As shown in Table A-13, RFI sampling events provide the analytical data relevant to Feature 58FF, Pile of Fire Bricks. Sample locations, depth ranges, and collection techniques are also listed in Table A-13.

Table A-13
Soil Sampling Locations for SWMU 58, Feature 58FF, Pile of Fire Bricks

Sampling Event	Date Performed	Number of Soil Sample Locations	Sample Depth Range (ft bgs)	Collection Technique
RFI Soil Sampling	1995	4	0.0–0.5	HT
	1999	13	0.0–0.5	HT
RFI Subsurface Soil Sampling	1996	1 (borehole)	0.0–20	Split-spoon sampler
	1996	6 (borehole)	5–29	Split-spoon sampler
	1997	7 (borehole)	10–50	Split-spoon sampler

bgs = Below ground surface.
ft = Foot (feet).
HT = Hand trowel.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.

Highlights of the analytical results for Feature 58FF, Pile of Fire Bricks include:

- The following 11 metals were detected at levels above background concentrations:
  - Arsenic
  - Barium
  - Beryllium
  - Cadmium
  - Chromium
  - Copper
  - Lead
  - Mercury
  - Nickel
  - Silver
  - Zinc

- The following three radionuclides were detected above background activity levels:
  - Th-232
  - U-235
  - U-238
- No HE compounds were detected.
- A low concentration of the VOC chloroform was detected.
- No SVOCs were detected.

Table A-14 presents the analytes and corresponding analytical laboratory that performed the analyses for each sampling event concerning Feature 58FF, Pile of Fire Bricks.

Table A-14
Analytes and Analytical Laboratories for SWMU 58, Feature 58FF, Pile of Fire Bricks

Sampling Event	Number of Soil Sample Locations	Analytes	Laboratory
RFI Soil Sampling	17 (surface)	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy	GEL, LAS, RPSD, ERCL
	14 (borehole)	Metals, HE, VOCs, SVOCs, Gamma Spectroscopy	GEL, RPSD

GEL = General Engineering Laboratories, Inc.
HE = High explosive(s).
LAS = Lockheed Analytical Services.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

A total of 215 analyses are applicable to Feature 58FF, Pile of Fire Bricks (Table A-15). As shown in Table A-15, the QA/QC analyses consisted of nine duplicates, seven equipment blanks, and one VOC trip blank. For each of the sampling events, the duplicate soil samples were collected at ratios complying with the ER Project Quality Assurance Project Plan. The aqueous VOC trip blank was supplied by the off-site analytical laboratory. The equipment (aqueous rinsate) blanks were prepared in the field as part of the sampling effort. No significant QA/QC problems were identified in the analyses for the duplicate, equipment blank, or VOC trip blank samples.

Table A-16 summarizes the analytical methods and data quality requirements for Feature 58FF, Pile of Fire Bricks. The confirmatory analytical data were reviewed and verified/validated according to "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03 (SNL/NM December 1999). In addition, the RPSD Laboratory reviewed all gamma spectroscopy results according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996).

Table A-15
Number of Analyses for Soil Samples Collected for SWMU 58, Feature 58FF, Pile of Fire Bricks

Sampling Type	Metals	VOCs	SVOCs	HE	Radionuclides	Number of Analyses
Soil	87	21	21	21	45	195
Duplicate	4	1	1	3	1	8
Equipment Blank	4	1	1	1	0	7
VOC Trip Blank	–	1	–	–	–	1
Total Samples	95	24	23	25	46	213

HE = High explosive(s).
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.
– = Not applicable.

Table A-16
Summary of Data Quality Requirements and Total Number of Analyses (Off- and On-Site) for RFI Soil Samples for SWMU 58, Feature 58FF, Pile of Fire Bricks

Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b]	Analyses from On-Site Laboratory[c]
Metals EPA Method 6010/7000	Defensible	91	0
HE EPA Method 8330	Defensible	24	0
VOCs EPA Method 8260	Defensible	22	0
SVOCs EPA Method 8270	Defensible	22	0
Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	46
Total number of analyses[d]		158	46

[a]EPA Methods from EPA (November 1986).
[b]GEL and LAS provided the off-site analyses.
[c]RPSD Laboratory provided the on-site analyses.
[d]Includes duplicate samples, but not other QA/QC samples such as equipment blanks or trip blanks.
EPA = U.S. Environmental Protection Agency.
GEL = General Engineering Laboratories, Inc.
HASL = Health and Safety Lab Manual.
HE = High explosive(s).
LAS = Lockheed Analytical Services.
QA = Quality assurance.
QC = Quality control.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

II.5 Data Quality Objectives for SWMU 58, Feature 58TT—Fire Brick Area No. 2

As shown in Table A-17, one confirmatory sampling event provides the analytical data relevant to Feature 58TT, Fire Brick Area No. 2. Sample locations, depth ranges, and collection techniques are also listed in Table A-17.

Table A-17
Soil Sampling Locations for SWMU 58,
Feature 58TT, Fire Brick Area No. 2

Sampling Event	Date Performed	Number of Soil Sample Locations	Sample Depth Range (ft bgs)	Collection Technique
VCM Soil Sampling	1999	6	0.0–0.5	HT

bgs = Below ground surface.
ft = Foot (feet).
HT = Hand trowel.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

Highlights of the analytical results for Feature 58TT, Fire Brick Area No. 2 include:

- The metal lead was detected at a level above the background concentration.
- The following two radionuclides were detected above background activity levels:
  - U-235
  - U-238
- No HE compounds were detected.

Table A-18 presents the analytes and corresponding analytical laboratory that performed the analyses for each sampling event concerning Feature 58TT, Fire Brick Area No. 2.

Table A-18
Analytes and Analytical Laboratories for SWMU 58,
Feature 58TT, Fire Brick Area No. 2

Sampling Event	Number of Soil Sample Locations	Analytes	Laboratories
VCM Soil Sampling	6 (surface)	Metals, HE, Gamma Spectroscopy	GEL, RPSD

GEL = General Engineering Laboratories, Inc.
HE = High explosive(s).
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

A total of 20 analyses are applicable to Feature 58TT, Fire Brick Area No. 2 (Table A-19). As shown in Table A-19, the QA/QC analyses consisted of two duplicates. For the sampling event, the duplicate soil samples were collected at ratios complying with the ER Project Quality Assurance Project Plan. No significant QA/QC problems were identified in the analyses for the duplicate samples.

Table A-19
Number of Analyses for Soil Samples Collected for SWMU 58,
Feature 58TT, Fire Brick Area No. 2

Sampling Type	Metals	HE	Radionuclides	Number of Analyses
Soil	6	6	6	18
Duplicate	1	–	1	2
Equipment Blank	–	–	–	–
Total Samples	7	6	7	20

HE = High explosive(s).
SWMU = Solid Waste Management Unit.
– = Not applicable.

Table A-20 summarizes the analytical methods and data quality requirements for SWMU 58, Feature 58TT, Fire Brick Area No. 2. The confirmatory analytical data were reviewed and verified/validated according to "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project AOP 00-03 (SNL/NM December 1999). In addition, the RPSD Laboratory reviewed all gamma spectroscopy results according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996).

Table A-20
Summary of Data Quality Requirements and Total Number of Analyses
(Off- and On-Site) for Confirmatory Soil Samples for
SWMU 58, Feature 58TT, Fire Brick Area No. 2

Analytical Method[a]	Data Quality Level	Analyses from Off-Site Laboratory[b]	Analyses from On-Site Laboratory[c]
Metals EPA Method 6010/7000	Defensible	7	0
HE EPA Method 8330	Defensible	6	0
Gamma Spectroscopy HASL 300 or EPA Method 901.1	Defensible	0	7
Total number of analyses[d]		13	7

[a]EPA Methods from EPA (November 1986).
[b]GEL provided the off-site analyses.
[c]RPSD Laboratory provided the on-site analyses.
[d]Includes duplicate samples, but not other QA/QC samples such as equipment blanks or trip blanks.
EPA = U.S. Environmental Protection Agency.
GEL = General Engineering Laboratories, Inc.
HASL = Health and Safety Lab Manual.
HE = High explosive(s).
QA = Quality assurance.
QC = Quality control.
RPSD = Radiation Protection Sample Diagnostics Laboratory.
SWMU = Solid Waste Management Unit.

III. Determination of Nature, Rate, and Extent of Contamination

III.1 Introduction

The determination of the nature, migration rate, and extent of contamination at SWMUs 8 and 58 is based upon an initial conceptual model validated with confirmatory soil sampling. The initial conceptual model was developed from archival site research, site inspections, and soil sampling. Subsequent characterization, remediation, and confirmatory sampling results were used to select the five areas evaluated (the SWMUs 8 and 58 Combination Area, Debris Pile and Pit area [8Y/58B], Area of Open Burning [8PP/8RR], Pile of Fire Bricks [58FF], and Fire Brick Area No. 2 [58TT]) used for the risk assessment analysis. The information used to determine the nature, migration rate, and extent of contamination is described in the following sections.

III.2 Nature of Contamination

Both the nature of contamination and the potential for the degradation of constituents of concern (COCs) at SWMUs 8 and 58 are evaluated using laboratory analyses of the soil samples. The analytical requirements included analyses for metals, radionuclides, HE compounds, VOCs, and SVOCs. The analytes and methods listed in Tables A-3, A-4, A-7, A-8, A-11, A-12, A-15, and A-16 are appropriate to characterize the COCs and potential degradation products at SWMUs 8 and 58.

III.3 Rate of Contaminant Migration

SWMUs 8 and 58 are inactive sites where remediation efforts have been completed. Therefore, all primary sources of COCs have been eliminated. As a result, only secondary sources of COCs potentially remain in the soil in the form of adsorbed COCs. The rate of COC migration from soil is therefore predominantly dependent upon precipitation and occasional surface-water flow. Data available from numerous SNL/NM monitoring programs for air quality, climate, water quality, and radionuclides (SNL/NM September 2003) are adequate for characterizing the rate of COC migration at SWMUs 8 and 58.

III.4 Extent of Contamination

Soil samples were collected from the surface and subsurface at SWMUs 8 and 58 in order to determine the vertical and horizontal extent of contamination. During the RFI activities, soil samples were collected from the surface to a maximum depth of 63 feet bgs. These soil samples are considered to be representative of the soil and sufficient to determine the vertical extent, if any, of COCs.

In summary, the design of the confirmatory soil sampling plan was appropriate and adequate to determine the nature, migration rate, and extent of residual COCs in the surface and subsurface soil at SWMUs 8 and 58.

IV. Comparison of COCs to Background Screening Levels

Site history and characterization activities are used to identify potential COCs. The SWMUs 8 and 58 request for a determination of CAC without controls describes the identification of COCs and the sampling that was conducted in order to determine the concentration levels of those COCs across the site. Generally, COCs evaluated in this risk assessment include all detected organic, inorganic, and radiological COCs for which samples were analyzed. When the detection limit of an organic compound is too high (i.e., could possibly cause an adverse effect to human health or the environment), the compound is retained. Nondetected organic compounds not included in this assessment were determined to have detection limits low enough to ensure protection of human health and the environment. In order to provide conservatism in this risk assessment, the calculation used only the maximum concentration value of each COC found for the entire site. The SNL/NM maximum background concentration (Garcia November 1998, Dinwiddie September 1997) was selected to provide the background screen listed in Tables A-21 through A-35.

Nonradiological inorganic constituents that are essential nutrients, such as iron, magnesium, calcium, potassium, and sodium, are not included in this risk assessment (EPA 1989). Both radiological and nonradiological COCs are evaluated. The nonradiological COCs included in the risk assessment consist of both inorganic and organic compounds.

Tables A-21 through A-28 list the nonradiological COCs for the human health and ecological risk assessments at SWMUs 8 and 58 for each of the areas evaluated. Tables A-29 through A-35 list radiological COCs for the human health and ecological risk assessments for each of the areas evaluated. All tables show the associated SNL/NM maximum background concentration values (Garcia November 1998). Section VI.4 discusses the results for the human health data presented; Sections VII.2 and VII.3 discuss the results for the ecological data presented.

V. Fate and Transport

The primary releases of COCs at SWMUs 8 and 58 were to the surface soil resulting from various high explosive tests performed at SWMU 58, and debris disposed of at SWMU 8. Wind, water, and biota are natural mechanisms of COC transport from the primary release point. Infiltration of precipitation is essentially nonexistent at SWMUs 8 and 58, as virtually all of the moisture either drains away from the site or evaporates. Because groundwater at this site is approximately 51 feet bgs, the potential for COCs to reach groundwater through the unsaturated zone above the water table is extremely low.

The COCs at SWMUs 8 and 58 include both inorganic and organic constituents. The inorganic COCs include both radiological and nonradiological analytes. The inorganic COCs are elemental in form and are not considered to be degradable. Transformations of these inorganic constituents could include changes in valence (oxidation/reduction reactions) or incorporation into organic forms (e.g., the conversion of selenite or selenate from soil to seleno-amino

Table A-21
Nonradiological COCs for Human Health Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} (all available analytical data)

COC	Maximum Concentration (All Samples) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	137 J	9.8	**No**	44[c]	–	**Yes**
Barium	988 J	246	**No**	170[d]	–	**Yes**
Beryllium	79.3	0.75	**No**	19[c]	–	No
Cadmium	6.02	0.64	**No**	64[c]	–	**Yes**
Chromium, total	161 J	18.8	**No**	16[c]	–	No
Copper	684	17.1	**No**	6[c]	–	No
Lead	15000	18.9	**No**	49[c]	–	**Yes**
Mercury	0.585	0.055	**No**	5,500[c]	–	**Yes**
Nickel	3960	16.6	**No**	47[c]	–	**Yes**
Selenium	79 J	2.7	**No**	800[e]	–	**Yes**
Silver	60.5	<0.5	**No**	0.5[c]	–	No
Total Uranium	2.3	3.42	Yes	20[d]	–	No
Zinc	225	52.1	**No**	47[c]	–	**Yes**
Organic						
Acetone	0.021	NA	**NA**	0.69[f]	-0.24[f]	No
2-Amino-4,6-dinitrotoluene	0.45 J	NA	**NA**	3.76[g]	1.94[g]	No
4-Amino-2,6-dinitrotoluene	0.68	NA	**NA**	3.76[g]	1.94[g]	No
Benzo(a)pyrene	0.235 J	NA	**NA**	3,000[c]	6.04[c]	**Yes**
Benzo(b)anthracene	0.202 J	NA	**NA**	10,000[h]	5.61[h]	**Yes**
2-Butanone	0.075	NA	**NA**	1[f]	0.29[f]	No
Chloroform	0.0025[i]	NA	**NA**	10.35[f]	1.92[h]	No
Chrysene	0.248 J	NA	**NA**	18,000[h]	5.91[h]	**Yes**
Diethyl phthalate	0.269 J	NA	**NA**	117[j]	2.47[j]	**Yes**
m-Dinitrobenzene	0.15	NA	**NA**	8.5[h]	1.49[h]	**No**
2,4-Dinitrotoluene	0.36 J	NA	**NA**	204[h]	1.98[h]	**Yes**

Refer to footnotes at end of table.

Table A-21 (Concluded)
Nonradiological COCs for Human Health Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} (all available analytical data)

COC	Maximum Concentration (All Samples) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Ethylbenzene	0.0005[i]	NA	**NA**	15.5[j]	3.15[j]	No
bis(2-Ethylhexyl) phthalate	3.41	NA	**NA**	851[j]	7.6[h]	No
Fluoranthene	0.278 J	NA	**NA**	12,302[k]	4.90[k]	**Yes**
2-Hexanone	0.0157	NA	**NA**	6[l]	1.38[l]	No
HMX	5.6 J	NA	**NA**	0.49[m]	0.26[n]	No
Methylene chloride	0.0125[i]	NA	**NA**	5[f]	1.25[f]	No
n-Nitrosodiphenylamine	0.253 J	NA	**NA**	217[h]	3.13[h]	**Yes**
Pentachlorophenol	0.27 J	NA	**NA**	776[k]	5.09[h]	**Yes**
Pyrene	0.334 J	NA	**NA**	36,300[c]	5.32[f]	**Yes**
RDX	19.9 J	NA	**NA**	9[o]	0.87[h]	No
Toluene	0.025	NA	**NA**	10.7[c]	2.69[c]	No
2,4,6-Trinitrotoluene	20 J	NA	**NA**	453[p]	1.6[h]	**Yes**

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.

[a]Garcia November 1998, Canyon Area.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Callahan et al. 1979
[f]Howard 1990.
[g]Talmage 1996.
[h]Micromedex, Inc. 1998.
[i]Parameter was not detected. Concentration used is one-half of the highest detection limit.
[j]Howard 1989.
[k]Howard 1991.
[l]Howard 1993.
[m]Rosenblatt et al. 1991.
[n]Maxwell and Opresko 1996.
[o]Talmage et al. 1996.
[p]Talmage et al. 1995.

BCF = Bioconcentration factor.
COC = Constituent of concern.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-22
Nonradiological COCs for Ecological Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} (all available analytical data)

COC	Maximum Concentration (Samples ≤ 5 ft bgs) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	38 J	9.8	**No**	44[c]	–	**Yes**
Barium	465 J	246	**No**	170[d]	–	**Yes**
Beryllium	1.5	0.75	**No**	19[c]	–	No
Cadmium	6.02	0.64	**No**	64[c]	–	**Yes**
Chromium, total	84	18.8	**No**	16[c]	–	No
Copper	684	17.1	**No**	6[c]	–	No
Lead	4,150	18.9	**No**	49[c]	–	**Yes**
Mercury	0.585	0.055	**No**	5,500[c]	–	**Yes**
Nickel	252	16.6	**No**	47[c]	–	**Yes**
Selenium	59 J	2.7	**No**	800[e]	–	**Yes**
Silver	60.5	<0.5	**No**	0.5[c]	–	No
Total Uranium	2.3	3.42	Yes	20[d]	–	No
Zinc	225	52.1	**No**	47[c]	–	**Yes**
Organic						
Acetone	0.021	NA	**NA**	0.69[f]	-0.24[f]	No
2-Amino-4,6-dinitrotoluene	0.45 J	NA	**NA**	3.76[g]	1.94[g]	No
4-Amino-2,6-dinitrotoluene	0.68	NA	**NA**	3.76[g]	1.94[g]	No
Benzo(a)pyrene	0.235 J	NA	**NA**	3,000[c]	6.04[c]	**Yes**
Benzo(b)anthracene	0.202 J	NA	**NA**	10,000[h]	5.61[h]	**Yes**
2-Butanone	0.00105	NA	**NA**	1[f]	0.29[f]	No
Chloroform	0.0025[i]	NA	**NA**	10.35[f]	1.92[h]	No
Chrysene	0.248 J	NA	**NA**	18,000[h]	5.91[h]	**Yes**
Diethyl phthalate	0.269 J	NA	**NA**	117[j]	2.47[j]	**Yes**
m-Dinitrobenzene	0.15	NA	**NA**	8.5[h]	1.49[h]	No
2,4-Dinitrotoluene	0.36 J	NA	**NA**	204[h]	1.98[h]	**Yes**

Refer to footnotes at end of table.

Table A-22 (Concluded)
Nonradiological COCs for Ecological Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} (all available analytical data)

COC	Maximum Concentration (Samples ≤ 5 ft bgs) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Ethylbenzene	0.0005[j]	NA	**NA**	15.5[j]	3.15[j]	No
bis(2-Ethylhexyl) phthalate	0.342	NA	**NA**	851[j]	7.6[h]	No
Fluoranthene	0.278 J	NA	**NA**	12,302[k]	4.90[k]	**Yes**
2-Hexanone	0.0157	NA	**NA**	6[l]	1.38[l]	No
HMX	5.6 J	NA	**NA**	0.49[m]	0.26[n]	No
Methylene chloride	0.0125[i]	NA	**NA**	5[f]	1.25[f]	No
n-Nitrosodiphenylamine	0.253 J	NA	**NA**	217[h]	3.13[h]	**Yes**
Pentachlorophenol	0.27 J	NA	**NA**	776[k]	5.09[h]	**Yes**
Pyrene	0.334 J	NA	**NA**	36,300[c]	5.32[f]	**Yes**
RDX	19.9 J	NA	**NA**	9[o]	0.87[h]	No
Toluene	0.0046	NA	**NA**	10.7[c]	2.69[c]	No
2,4,6-Trinitrotoluene	20 J	NA	**NA**	453[p]	1.6[h]	**Yes**

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.

[a]Garcia November 1998, Canyon Area.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Callahan et al. 1979.
[f]Howard 1990.
[g]Talmage 1996.
[h]Micromedex, Inc. 1998.
[i]Parameter was not detected. Concentration used is one-half of the highest detection limit.
[j]Howard 1989.
[k]Howard 1991.
[l]Howard 1993.
[m]Rosenblatt et al. 1991.
[n]Maxwell and Opresko 1996.
[o]Talmage et al. 1996.
[p]Talmage et al. 1995.

BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-23
Nonradiological COCs for Human Health Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (All Samples) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	3.17 J	9.8	Yes	44[c]	–	**Yes**
Barium	154	246	Yes	170[d]	–	**Yes**
Beryllium	0.507	0.75	Yes	19[c]	–	No
Cadmium	1.18 J	0.64	**No**	64[c]	–	**Yes**
Chromium, total	61.8	18.8	**No**	16[c]	–	No
Copper	543	17.1	**No**	6[c]	–	No
Lead	58.5 J	18.9	**No**	49[c]	–	**Yes**
Mercury	0.258	0.055	**No**	5,500[c]	–	**Yes**
Nickel	815	16.6	**No**	47[c]	–	**Yes**
Selenium	1.08	2.7	Yes	800[e]	–	**Yes**
Silver	6.71 J	<0.5	**No**	0.5[c]	–	No
Total Uranium	2.3	3.42	Yes	20[d]	–	No
Zinc	225	52.1	**No**	47[c]	–	**Yes**
Organic						
2-Amino-4,6-dinitrotoluene	0.45 J	NA	**NA**	3.76[f]	1.94[f]	No
4-Amino-2,6-dinitrotoluene	0.48 J	NA	**NA**	3.76[f]	1.94[f]	No
2-Butanone	0.05 J	NA	**NA**	1[g]	0.29[g]	No
Diethyl phthalate	0.269 J	NA	**NA**	117[h]	2.47[h]	**Yes**
bis(2-Ethylhexyl) phthalate	0.408 J	NA	**NA**	851[h]	7.6[i]	**Yes**
HMX	5.6 J	NA	**NA**	0.49[j]	0.26[k]	No
Methylene chloride	0.0098	NA	**NA**	5[g]	1.25[g]	No

Refer to footnotes at end of table.

Table A-23 (Concluded)
Nonradiological COCs for Human Health Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (All Samples) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
RDX	0.27 J	NA	**NA**	9[l]	0.87[i]	No
Toluene	0.017 J	NA	**NA**	10.7[c]	2.69[c]	No
2,4,6-Trinitrotoluene	20 J	NA	**NA**	453[m]	1.6[i]	**Yes**

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.
[a]Garcia November 1998, Canyon Area.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Callahan et al. 1979.
[f]Talmage 1996.
[g]Howard 1990.
[h]Howard 1989.
[i]Micromedex, Inc. 1998.
[j]Rosenblatt et al. 1991.
[k]Maxwell and Opresko 1996.
[l]Talmage et al. 1996.
[m]Talmage et al. 1995.

BCF = Bioconcentration factor.
COC = Constituent of concern.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-24
Nonradiological COCs for Ecological Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (Samples ≤ 5 ft bgs) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	3.17 J	9.8	Yes	44[c]	–	**Yes**
Barium	154	246	Yes	170[d]	–	**Yes**
Beryllium	0.507	0.75	Yes	19[c]	–	No
Cadmium	1.18 J	0.64	**No**	64[c]	–	**Yes**
Chromium, total	61.8	18.8	**No**	16[c]	–	No
Copper	543	17.1	**No**	6[c]	–	No
Lead	58.5 J	18.9	**No**	49[c]	–	**Yes**
Mercury	0.258	0.055	**No**	5,500[c]	–	**Yes**
Nickel	252	16.6	**No**	47[c]	–	**Yes**
Selenium	1.08	2.7	Yes	800[e]	–	**Yes**
Silver	6.71 J	<0.5	**No**	0.5[c]	–	No
Total Uranium	2.3	3.42	Yes	20[d]	–	No
Zinc	225	52.1	**No**	47[c]	–	**Yes**
Organic						
2-Amino-4,6-dinitrotoluene	0.45 J	NA	**NA**	3.76[f]	1.94[f]	No
4-Amino-2,6-dinitrotoluene	0.48 J	NA	**NA**	3.76[f]	1.94[f]	No
Diethyl phthalate	0.269 J	NA	**NA**	117[g]	2.47[g]	**Yes**
HMX	5.6 J	NA	**NA**	0.49[h]	0.26[i]	No
RDX	0.27 J	NA	**NA**	9[j]	0.87[k]	No
2,4,6-Trinitrotoluene	20 J	NA	**NA**	453[l]	1.6[k]	**Yes**

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.
[a]Garcia November 1998, Canyon Area.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.

Table A-24 (Concluded)
Nonradiological COCs for Ecological Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

[e]Callahan et al. 1979.
[f]Talmage 1996.
[g]Howard 1989.
[h]Rosenblatt et al. 1991.
[i]Maxwell and Opresko 1996.
[j]Talmage et al. 1996
[k]Micromedex, Inc. 1998.
[l]Talmage et al. 1995.

BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-25
Nonradiological COCs for Human Health and Ecological Risk Assessment at SWMU 8, Features 8PP and 8RR, Area of Open Burning, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (Samples ≤ 5 ft bgs) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	4.6	9.8	Yes	44[c]	–	**Yes**
Barium	196	246	Yes	170[d]	–	**Yes**
Beryllium	0.746	0.75	Yes	19[c]	–	No
Cadmium	0.0823 J	0.64	Yes	64[c]	–	**Yes**
Chromium, total	17.6	18.8	Yes	16[c]	–	No
Lead	9.75	18.9	Yes	49[c]	–	**Yes**
Mercury	0.0126	0.055	Yes	5,500[c]	–	**Yes**
Nickel	13.8	16.6	Yes	47[c]	–	**Yes**
Selenium	4.05[e]	2.7	**No**	800[f]	–	**Yes**
Silver	0.0971 J	<0.5	Yes	0.5[c]	–	No

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.
[a]Garcia November 1998, Canyon Area.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Parameter was not detected. Concentration used is one-half of the highest detection limit.
[f]Callahan et al. 1979.

BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-26
Nonradiological COCs for Human Health Risk Assessment at SWMU 58, Feature 58FF, Pile of Fire Bricks, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (All Samples) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	103 J	9.8	**No**	44[c]	–	**Yes**
Barium	585 J	246	**No**	170[d]	–	**Yes**
Beryllium	79.3	0.75	**No**	19[c]	–	No
Cadmium	0.875	0.64	**No**	64[c]	–	**Yes**
Chromium, total	161 J	18.8	**No**	16[c]	–	No
Copper	62.1 J	17.1	**No**	6[c]	–	No
Lead	15,000	18.9	**No**	49[c]	–	**Yes**
Mercury	0.273	0.055	**No**	5,500[c]	–	**Yes**
Nickel	3,960	16.6	**No**	47[c]	–	**Yes**
Selenium	1.28	2.7	Yes	800[e]	–	**Yes**
Silver	1.0[f]	<0.5	**No**	0.5[c]	–	No
Zinc	108 J	52.1	**No**	47[c]	–	**Yes**
Organic						
Chloroform	0.0025[f]	NA	**NA**	10.35[g]	1.92[h]	No

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.
[a]Garcia November 1998, Canyon Area.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Callahan et al. 1979.
[f]Parameter was not detected. Concentration used is one-half of the highest detection limit.
[g]Howard 1990.
[h]Micromedex, Inc. 1998.

BCF = Bioconcentration factor.
COC = Constituent of concern.
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-27
Nonradiological COCs for Ecological Risk Assessment at SWMU 58, Feature 58FF, Pile of Fire Bricks, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (Samples ≤ 5 ft bgs) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	6.1	9.8	Yes	44[c]	–	**Yes**
Barium	318	246	**No**	170[d]	–	**Yes**
Beryllium	0.601	0.75	Yes	19[c]	–	No
Cadmium	0.5[e]	0.64	Yes	64[c]	–	**Yes**
Chromium, total	43.5	18.8	**No**	16[c]	–	No
Copper	38	17.1	**No**	6[c]	–	No
Lead	120	18.9	**No**	49[c]	–	**Yes**
Mercury	0.05[e]	0.055	Yes	5,500[c]	–	**Yes**
Nickel	61.1	16.6	**No**	47[c]	–	**Yes**
Selenium	1.04	2.7	Yes	800[f]	–	**Yes**
Silver	1.0[e]	<0.5	**No**	0.5[c]	–	No
Zinc	70.2	52.1	**No**	47[c]	–	**Yes**
Organic						
Chloroform	0.0025[e]	NA	**NA**	10.35[g]	1.92[h]	No

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.

[a]Garcia November 1998, Canyon Area.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Parameter was not detected. Concentration used is one-half of the highest detection limit.
[f]Callahan et al. 1979.
[g]Howard 1990.
[h]Micromedex, Inc. 1998.

BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-28
Nonradiological COCs for Human Health and Ecological Risk Assessment at SWMU 58, Feature 58TT, Fire Brick Area No. 2, with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (Samples ≤ 5 ft bgs) (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, Log K_{ow}>4)
Inorganic						
Arsenic	3.18	9.8	Yes	44[c]	–	**Yes**
Barium	150	246	Yes	170[d]	–	**Yes**
Beryllium	0.426 J	0.75	Yes	19[c]	–	No
Cadmium	0.207 J	0.64	Yes	64[c]	–	**Yes**
Chromium, total	10.2	18.8	Yes	16[c]	–	No
Lead	78.8	18.9	**No**	49[c]	–	**Yes**
Mercury	0.00749 J	0.055	Yes	5,500[c]	–	**Yes**
Nickel	10.1	16.6	Yes	47[c]	–	**Yes**
Selenium	0.0675[e]	2.7	Yes	800[f]	–	**Yes**
Silver	0.253 J	<0.5	Yes	0.5[c]	–	No

Note: **Bold** indicates the COCs that exceed the background screening values and/or are bioaccumulators.
[a]Garcia November 1998, Canyon Area.
[b]NMED March 1998.
[c]Yanicak March 1997.
[d]Neumann 1976.
[e]Parameter was not detected. Concentration used is one-half of the highest detection limit.
[f]Callahan et al. 1979.

BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NMED = New Mexico Environment Department.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-29
Radiological COCs for Human Health Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value and BCF (all available analytical data)

COC	Maximum Activity (All Samples) (pCi/g)[a]	SNL/NM Background Activity (pCi/g)[b]	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[c] (BCF >40)
Cs-137	**2.96**	1.55	**No**	3,000[d]	**Yes**
H-3	**0.041**	0.021[e]	**No**	NA	No
Th-232	**5.37**	1.03	**No**	3,000[d]	**Yes**
U-235	**2.42**	0.16	**No**	900[d]	**Yes**
U-238	**93.0**	2.31	**No**	900[d]	**Yes**

Note: **Bold** indicates COCs that exceed the background screening values and/or are bioaccumulators.
[a]Value listed is the greater of either the maximum detection or the highest MDA.
[b]Dinwiddie September 1997, Canyon Area Supergroup.
[c]NMED March 1998.
[d]Baker and Soldat 1992.
[e]Tharp February 1999.
BCF = Bioconcentration factor.
COC = Constituent of concern.
MDA = Minimum detectable activity.
NA = Not applicable.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

Table A-30
Radiological COCs for Ecological Risk Assessment at SWMUs 8 and 58 Combination Area with Comparison to the Associated SNL/NM Background Screening Value and BCF (all available analytical data)

COC	Maximum Activity (Samples ≤ 5 ft bgs) (pCi/g)[a]	SNL/NM Background Activity (pCi/g)[b]	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[c] (BCF >40)
Cs-137	**2.96**	1.55	**No**	3,000[d]	**Yes**
H-3	0.017	0.021[e]	Yes	NA	No
Th-232	**5.37**	1.03	**No**	3,000[d]	**Yes**
U-235	**2.42**	0.16	**No**	900[d]	**Yes**
U-238	**93.0**	2.31	**No**	900[d]	**Yes**

Note: **Bold** indicates COCs that exceed the background screening values and/or are bioaccumulators.
[a]Value listed is the greater of either the maximum detection or the highest MDA.
[b]Dinwiddie September 1997, Canyon Area Supergroup.
[c]NMED March 1998.
[d]Baker and Soldat 1992.
[e]Tharp February 1999.
BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
MDA = Minimum detectable activity.
NA = Not applicable.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

Table A-31
Radiological COCs for Human Health Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Activity (All Samples) (pCi/g)[a]	SNL/NM Background Activity (pCi/g)[b]	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[c] (BCF >40)
Cs-137	0.414	1.55	Yes	3,000[d]	**Yes**
H-3	**0.041**	0.021[e]	**No**	NA	No
Th-232	0.944	1.03	Yes	3,000[d]	**Yes**
U-235	**ND (0.240)**	0.16	**No**	900[d]	**Yes**
U-238	ND (0.816)	2.31	Yes	900[d]	**Yes**

Note: **Bold** indicates COCs that exceed the background screening values and/or are bioaccumulators.
[a]Value listed is the greater of either the maximum detection or the highest MDA.
[b]Dinwiddie September 1997, Canyon Area Supergroup.
[c]NMED March 1998.
[d]Baker and Soldat 1992.
[e]Tharp February 1999.
BCF = Bioconcentration factor.
COC = Constituent of concern.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

Table A-32
Radiological COCs for Ecological Risk Assessment at SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Activity (Samples ≤ 5 ft bgs) (pCi/g)[a]	SNL/NM Background Activity (pCi/g)[b]	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[c] (BCF >40)
Cs-137	0.414	1.55	Yes	3,000[d]	**Yes**
H-3	0.017	0.021[e]	Yes	NA	No
Th-232	0.944	1.03	Yes	3,000[d]	**Yes**
U-235	**ND (0.240)**	0.16	**No**	900[d]	**Yes**
U-238	ND (0.816)	2.31	Yes	900[d]	**Yes**

Note: **Bold** indicates COCs that exceed the background screening values and/or are bioaccumulators.
[a]Value listed is the greater of either the maximum detection or the highest MDA.
[b]Dinwiddie September 1997, Canyon Area Supergroup.
[c]NMED March 1998.
[d]Baker and Soldat 1992.
[e]Tharp February 1999.
BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

Table A-33
Radiological COCs for Human Health and Ecological Risk Assessment at SWMU 8, Features 8PP and 8RR, Area of Open Burning, with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Activity (Samples ≤ 5 ft bgs) (pCi/g)[a]	SNL/NM Background Activity (pCi/g)[b]	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[c] (BCF >40)
Cs-137	0.179	1.55	Yes	3,000[d]	**Yes**
Th-232	**1.07**	1.03	**No**	3,000[d]	**Yes**
U-235	**ND (0.277)**	0.16	**No**	900[d]	**Yes**
U-238	1.04	2.31	Yes	900[d]	**Yes**

Note: **Bold** indicates COCs that exceed the background screening values and/or are bioaccumulators.
[a]Value listed is the greater of either the maximum detection or the highest MDA.
[b]Dinwiddie September 1997, Canyon Area Supergroup.
[c]NMED March 1998.
[d]Baker and Soldat 1992.
BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
MDA = Minimum detectable activity.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

Table A-34
Radiological COCs for Human Health and Ecological Risk Assessment at SWMU 58, Feature 58FF, Pile of Fire Bricks, with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Activity (Maximum Samples ≤ 5 ft bgs) (pCi/g)[a]	SNL/NM Background Activity (pCi/g)[b]	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[c] (BCF >40)
Cs-137	1.06	1.55	Yes	3,000[d]	**Yes**
Th-232	**5.37**	1.03	**No**	3,000[d]	**Yes**
U-235	**ND (0.635)**	0.16	**No**	900[d]	**Yes**
U-238	**ND (6.14)**	2.31	**No**	900[d]	**Yes**

Note: **Bold** indicates COCs that exceed the background screening values and/or are bioaccumulators.
[a]Value listed is the greater of either the maximum detection or the highest MDA.
[b]Dinwiddie September 1997, Canyon Area Supergroup.
[c]NMED March 1998.
[d]Baker and Soldat 1992.
BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
MDA = Minimum detectable activity.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

Table A-35
Radiological COCs for Human Health and Ecological Risk Assessment at SWMU 58, Feature 58TT, Fire Brick Area No. 2, with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Activity (Maximum Samples ≤ 5 ft bgs) (pCi/g)[a]	SNL/NM Background Activity (pCi/g)[b]	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[c] (BCF >40)
Cs-137	0.155	1.55	Yes	3,000[d]	**Yes**
Th-232	0.901	1.03	Yes	3,000[d]	**Yes**
U-235	**1.49**	0.16	**No**	900[d]	**Yes**
U-238	**93.0**	2.31	**No**	900[d]	**Yes**

Note: **Bold** indicates COCs that exceed the background screening values and/or are bioaccumulators.
[a]Value listed is the greater of either the maximum detection or the highest MDA.
[b]Dinwiddie September 1997, Canyon Area Supergroup.
[c]NMED March 1998.
[d]Baker and Soldat 1992.
BCF = Bioconcentration factor.
bgs = Below ground surface.
COC = Constituent of concern.
ft = Foot (feet).
MDA = Minimum detectable activity.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

acids in plants). Radiological COCs will undergo decay to stable isotopes or radioactive daughter elements. However, because of the long half-lives of the radiological COCs (Cs-137, Th-232, U-235, and U-238), the aridity of the environment at this site, and the lack of potential contact with biota, none of these mechanisms are expected to result in significant losses or transformations of the inorganic COCs.

The organic COCs at SWMUs 8 and 58 consist of VOCs, SVOCs, and HE compounds. Organic constituents may be degraded through photolysis, hydrolysis, and biotransformation. Photolysis requires light and therefore takes place in the air, at the ground surface, or in surface water. Hydrolysis includes chemical transformations in water and may occur in the soil solution. Biotransformation (i.e., transformation caused by plants, animals, and microorganisms) may occur; however, biological activity may be limited by the arid environment at this site.

Table A-36 summarizes the fate and transport processes that can occur at SWMUs 8 and 58. COCs at this site include organic analytes as well as radiological and nonradiological inorganic analytes. Wind, surface water, and biota are considered to be of low significance as potential transport mechanisms at this site. Significant leaching into the subsurface soil is unlikely, and leaching into the groundwater at this site is highly unlikely. The potential for transformation of COCs is low, and loss through decay of the radiological COCs is insignificant because of their long half-lives.

Table A-36
Summary of Fate and Transport at SWMUs 8 and 58

Transport and Fate Mechanism	Existence at Site	Significance
Wind	Yes	Low
Surface runoff	Yes	Low
Migration to groundwater	No	None
Food chain uptake	Yes	Low
Transformation/degradation	Yes	Low

SWMU = Solid Waste Management Unit.

VI. Human Health Risk Assessment

VI.1 Introduction

The human health risk assessment of this site includes a number of steps that culminate in a quantitative evaluation of the potential adverse human health effects caused by constituents located at the site. The steps to be discussed include the following:

Step 1.	Site data are described that provide information on the potential COCs, as well as the relevant physical characteristics and properties of the site.
Step 2.	Potential pathways are identified by which a representative population might be exposed to the COCs.

Step 3.	The potential intake of these COCs by the representative population is calculated using a tiered approach. The first component of the tiered approach is a screening procedure that compares the maximum concentration of the COC to an SNL/NM maximum background screening value. COCs that are not eliminated during the first screening procedure are carried forward in the risk assessment process.
Step 4.	Toxicological parameters are identified and referenced for COCs that were not eliminated during the screening procedure.
Step 5.	Potential toxicity effects (specified as a hazard index [HI]) and estimated excess cancer risks are calculated for nonradiological COCs and background. For radiological COCs, the incremental total effective dose equivalent (TEDE) and estimated incremental cancer risk are calculated by subtracting applicable background concentrations directly from maximum on-site contaminant values. This background subtraction applies only when a radiological COC occurs as contamination and exists as a natural background radionuclide.
Step 6.	These values are compared with guidelines established by the U.S. Environmental Protection Agency (EPA), NMED, and the DOE to determine whether further evaluation and potential site cleanup are required. Nonradiological COC risk values also are compared to background risk so that an incremental risk can be calculated.
Step 7.	Uncertainties of the above steps are addressed.

VI.2 Step 1. Site Data

Section I of this risk assessment provides the site description and history for SWMUs 8 and 58. Section II presents a comparison of results to DQOs. Section III discusses the nature, rate, and extent of contamination.

VI.3 Step 2. Pathway Identification

SWMUs 8 and 58 have been designated with a future land-use scenario of industrial (DOE et al. October 1995) (see Appendix 1 for default exposure pathways and parameters). However, the residential land-use scenario is also considered in the pathway analysis. Because of the location and characteristics of the potential contaminants, the primary pathway for human exposure is considered to be soil ingestion for the nonradiological COCs and direct gamma exposure for the radiological COCs. The inhalation pathway for both nonradiological and radiological COCs is included because the potential exists to inhale dust. Soil ingestion is included for the radiological COCs as well. The dermal pathway is included for the nonradiological COCs because of the potential for the receptor to be exposed to contaminated soil. No water pathways to the groundwater are considered; depth to groundwater at SWMUs 8 and 58 is approximately 51 feet bgs. No intake routes through plant, meat, or milk ingestion are considered appropriate for either the industrial or residential land-use scenarios. Figures A-1 through A-5 show the conceptual site model flow diagrams for the SWMU 8 and 58 areas evaluated.

Pathway Identification

Nonradiological Constituents	Radiological Constituents
Soil ingestion	Soil ingestion
Inhalation (dust and volatiles)	Inhalation (dust and volatiles)
Dermal contact	Direct gamma

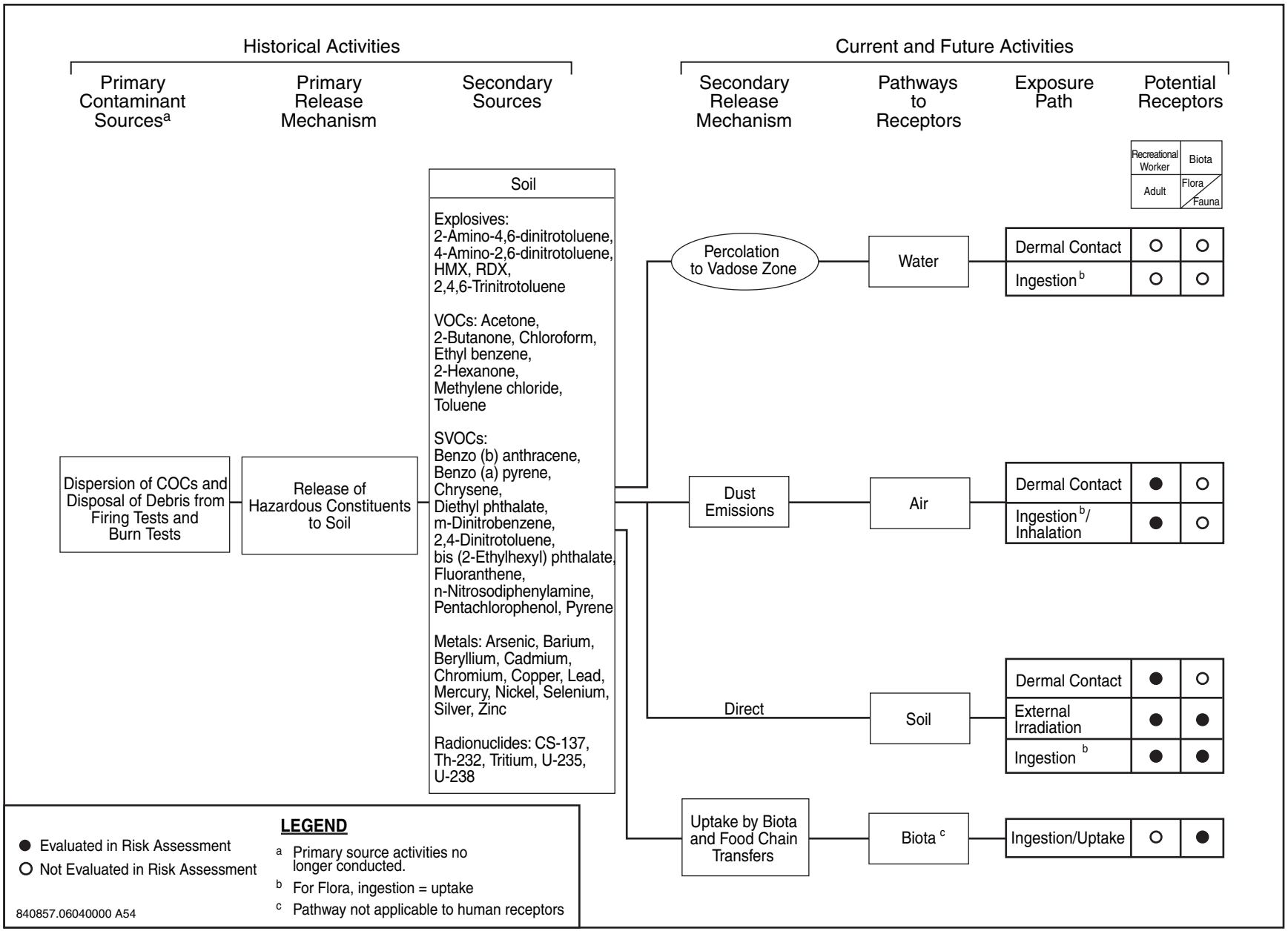

Figure A-1

Conceptual Site Model Flow Diagram for SWMUs 8 and 58 Combination Area

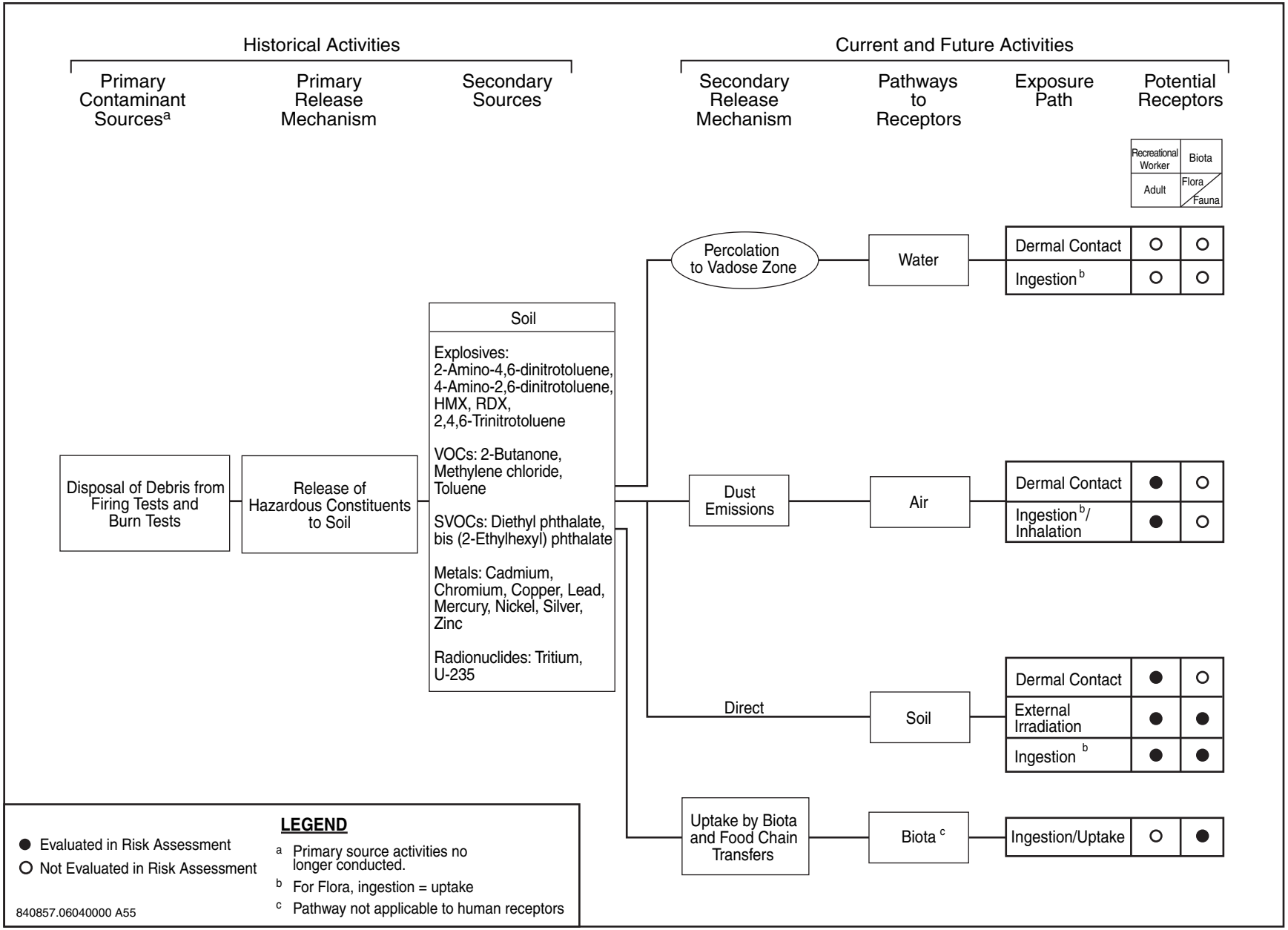

Figure A-2

Conceptual Site Model Flow Diagram for SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area

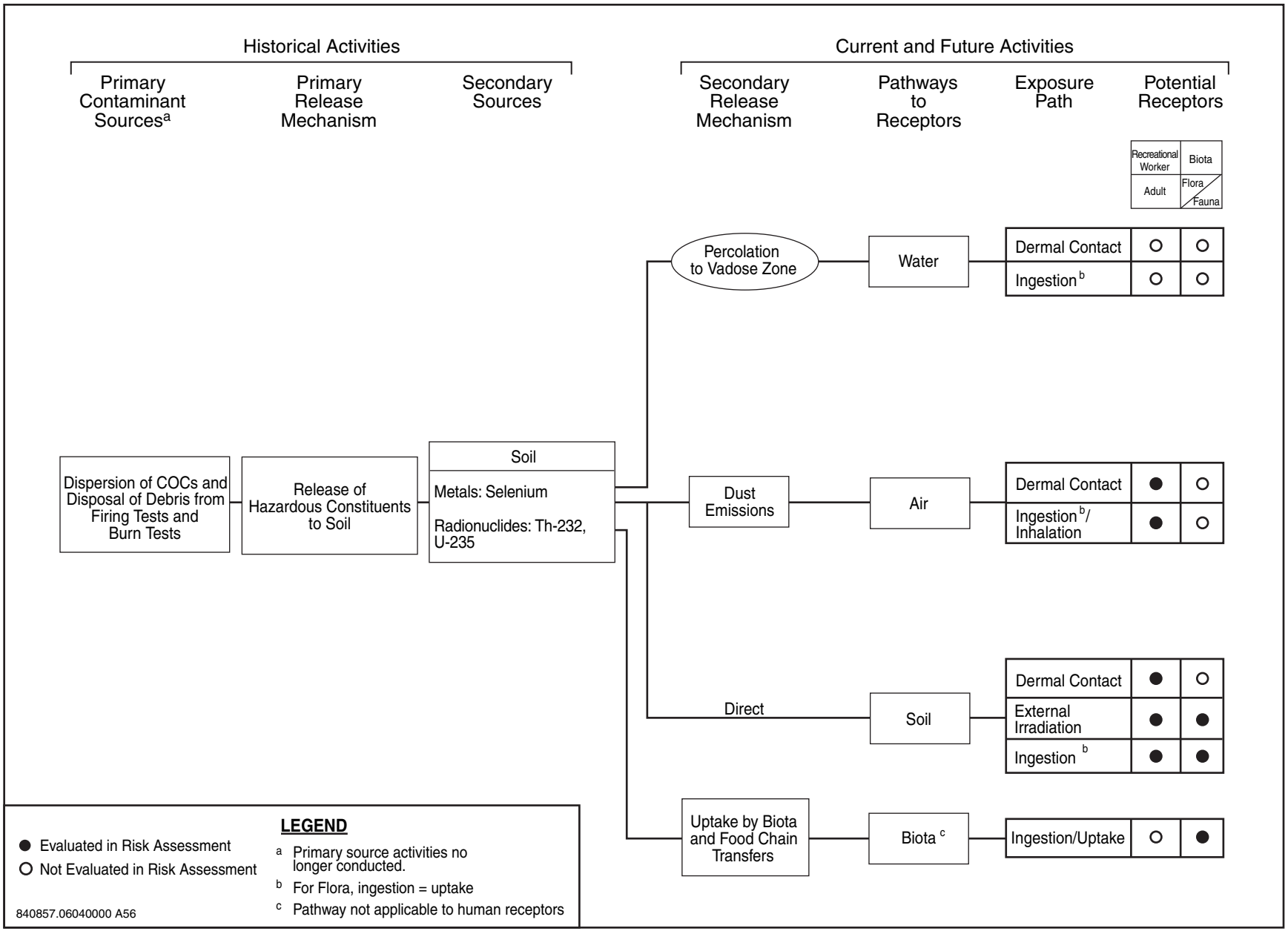

Figure A-3

Conceptual Site Model Flow Diagram for SWMU 8, Features 8PP and 8RR, Area of Open Burning

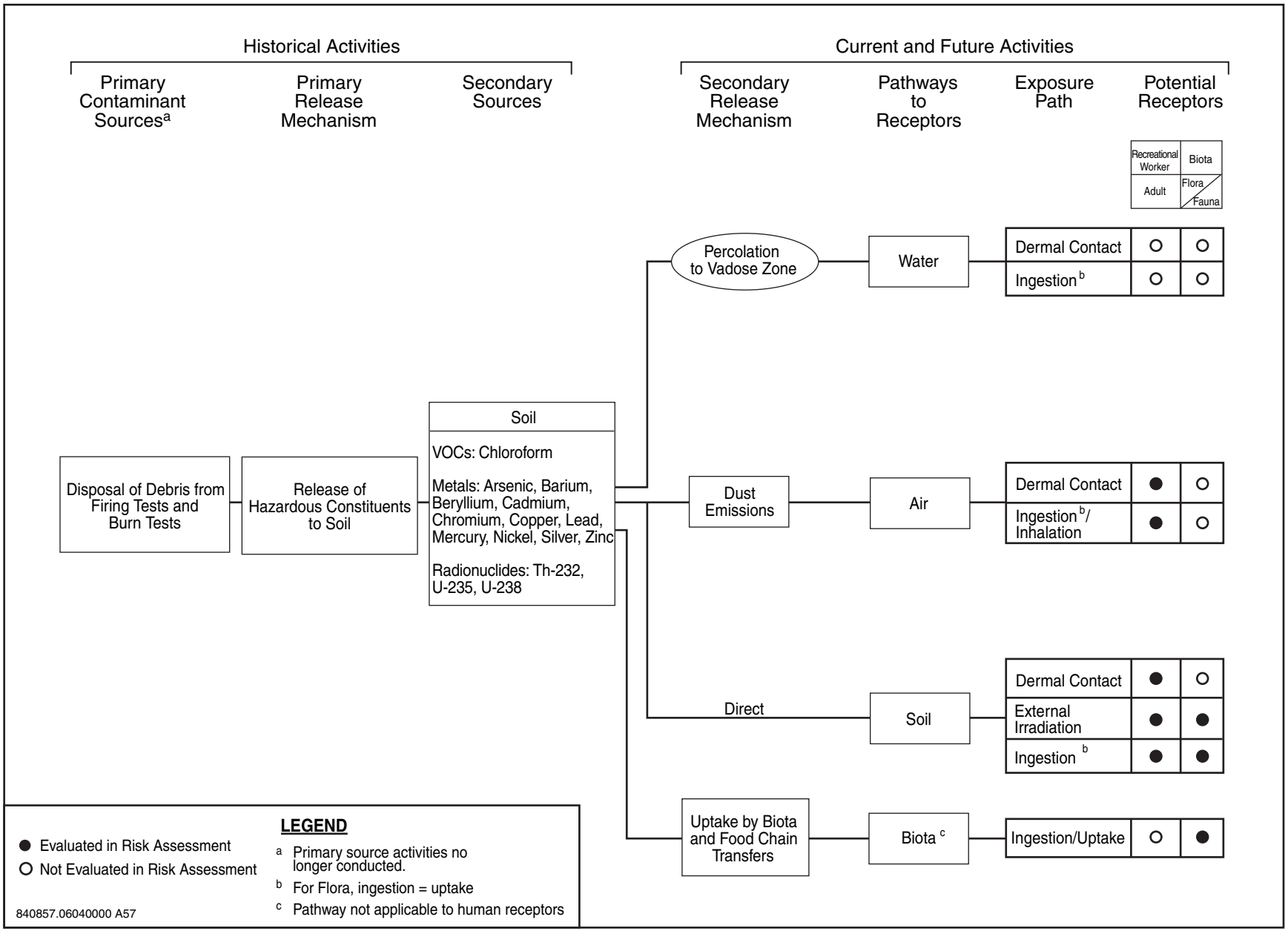

Figure A-4

Conceptual Site Model Flow Diagram for SWMU 58, Feature 58FF, Pile of Fire Bricks

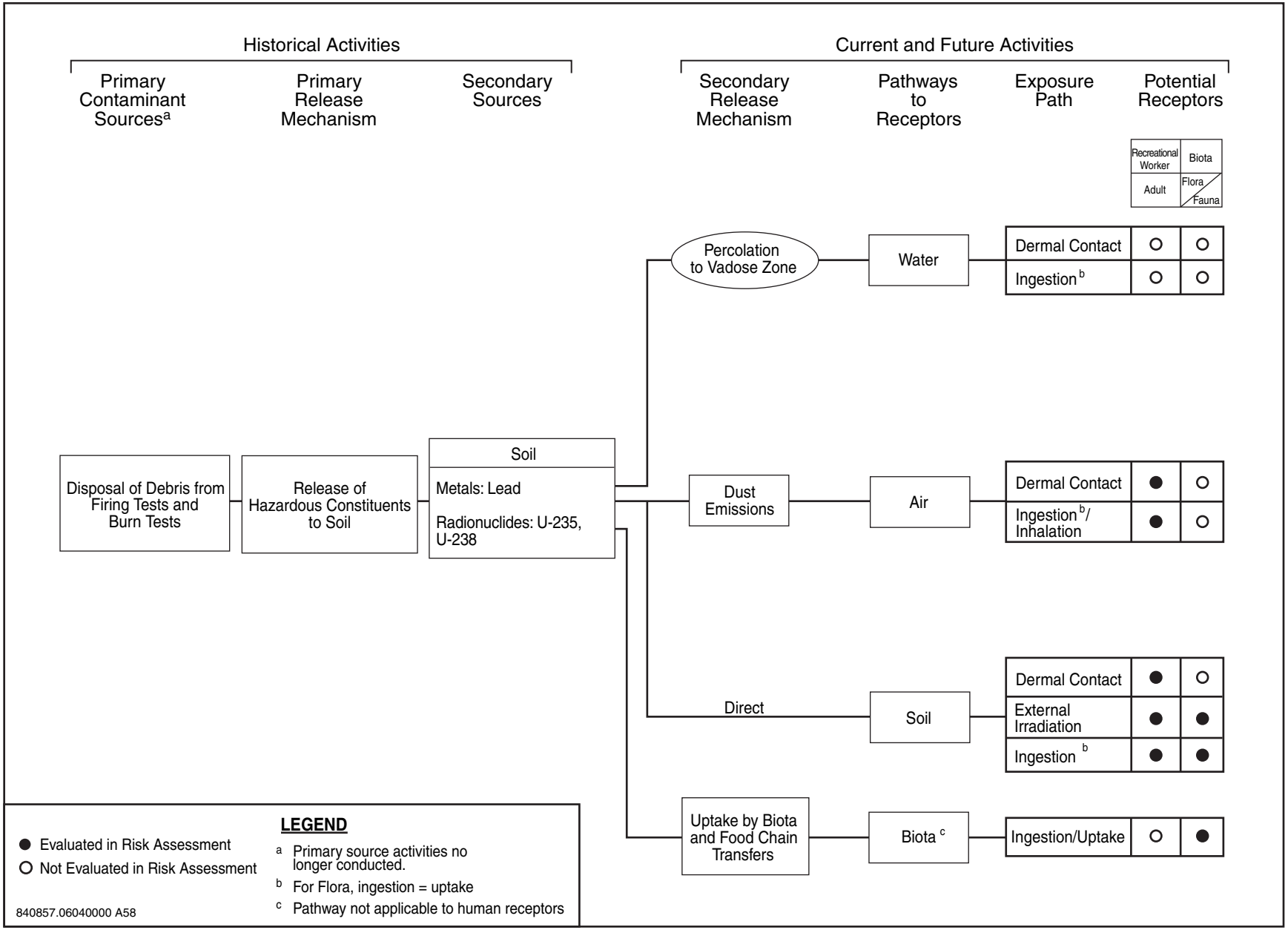

Figure A-5

Conceptual Site Model Flow Diagram for SWMU 58, Feature 58TT, Fire Brick Area No. 2

VI.4 Step 3. Background Screening Procedure

This section discusses Step 3, the background screening procedure, which compares the maximum COC concentration to the background screening level. The methodology and results are described in the following sections.

VI.4.1 Methodology

Maximum concentrations of nonradiological COCs were compared to the approved SNL/NM maximum screening levels for this area. The SNL/NM maximum background concentration was selected to provide the background screen and used to calculate risk attributable to background in Section VI.6.2. Only the COCs that were detected above the corresponding SNL/NM maximum background screening levels or did not have either a quantifiable or calculated background screening level were considered in further risk assessment analyses.

For the radiological COCs that exceed the SNL/NM background screening levels, background values were subtracted from the individual maximum radionuclide concentrations. Those that do not exceed these background levels are not carried any further in the risk assessment. This approach is consistent with DOE Order 5400.5, “Radiation Protection of the Public and the Environment” (DOE 1993). Radiological COCs that do not have background screening values and were detected above the analytical minimum detectable activity (MDA) are carried through the risk assessment at the maximum levels. The resultant radiological COCs remaining after this step are referred to as background-adjusted radiological COCs.

VI.4.2 Results

This section summarizes the background screening results for each of the SWMU 8 and 58 data sets evaluated in the risk assessment.

<u>SWMUs 8 and 58 Combination Area (all available analytical data)</u>

Tables A-21 and A-29 show the SWMUs 8 and 58 Combination area maximum COC concentrations from all available analytical data that were compared to the SNL/NM maximum background values (Garcia November 1998, Dinwiddie September 1997) for the human health risk assessment. For the nonradiological COCs, 12 constituents were measured at concentrations greater than the background screening values. Twenty-four nonradiological COCs are organic compounds that do not have corresponding background screening values.

The maximum concentration value for lead is 15,000 milligrams (mg)/kilogram (kg). The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for construction and industrial land-use scenarios are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is greater than all the screening values. However, because the site has been adequately characterized; average concentrations are more representative of actual site conditions. The upper confidence limit (UCL) of the mean concentration for lead is

327 mg/kg (Appendix 2). The UCL value for lead at this site is less than all of the screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

For the radiological COCs, five constituents (H-3, Cs-137, Th-232, U-235, and U-238) had activities greater than the background screening levels. The greater of either the maximum detection or the highest MDA is conservatively used in the risk assessment.

Debris Pile and Pit Area (Features 8Y/58B)

Tables A-23 and A-31 show Debris Pile and Pit area (8Y/58B) maximum COC concentrations that were compared to the SNL/NM maximum background values (Garcia November 1998, Dinwiddie September 1997) for the human health risk assessment. For the nonradiological COCs, eight constituents were measured at concentrations greater than the background screening values. Ten nonradiological COCs are organic compounds that do not have corresponding background screening values.

The maximum concentration value for lead is 58.5 mg/kg. The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for construction and industrial land-use scenarios are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is less than these screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

For the radiological COCs, two constituents (H-3, and U-235) had activities or MDA values greater than the background screening levels. The greater of either the maximum detection or the highest MDA is conservatively used in the risk assessment.

Area of Open Burning (Features 8PP/8RR)

Tables A-25 and A-33 show the Area of Open Burning (8PP/8RR) maximum COC concentrations that were compared to the SNL/NM maximum background values (Garcia November 1998, Dinwiddie September 1997) for the human health risk assessment. For the nonradiological COCs, one constituent (selenium) was measured at a concentration greater than its background screening value.

For the radiological COCs, two constituents (Th-232 and U-235) had maximum detections or MDA values greater than the background screening levels. The greater of either the maximum detection or the highest MDA is conservatively used in the risk assessment.

Pile of Fire Bricks (Feature 58FF)

Tables A-26 and A-34 show the maximum COC concentrations for the Pile of Fire Bricks (58FF) that were compared to the SNL/NM maximum background values (Garcia November 1998, Dinwiddie September 1997) for the human health risk assessment. For the nonradiological

COCs, eleven constituents were measured at concentrations greater than the background screening values. One nonradiological COC is an organic compound that does not have a corresponding background screening value.

The maximum concentration value for lead is 15,000 mg/kg. The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for construction and industrial land-use scenarios are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is greater than all the screening values. However, because the site has been adequately characterized; average concentrations are more representative of actual site conditions. The UCL of the mean concentration for lead is 988 mg/kg (Appendix 2). The UCL value for lead at this site is less than the industrial screening values. Therefore, lead is eliminated from consideration in the human health risk assessment for the industrial land-use scenario only.

For the radiological COCs, three constituents (Th-232, U-235, and U-238) had activities or MDA values greater than the background screening levels. The greater of either the maximum detection or the highest MDA is conservatively used in the risk assessment.

Fire Brick Area No. 2 (Feature 58TT)

Tables A-28 and A-35 show Fire Brick Area No. 2 (58TT) maximum COC concentrations that were compared to the SNL/NM maximum background values (Garcia November 1998, Dinwiddie September 1997) for the human health risk assessment. For the nonradiological COCs, one constituent (lead) was measured at a concentration greater than its background screening value.

The maximum concentration value for lead is 78.8 mg/kg. The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for construction and industrial land-use scenarios are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is less than all the screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

For the radiological COCs, two constituents (U-235 and U-238) had maximum detections or MDA values greater than the background screening levels. The greater of either the maximum detection or the highest MDA is conservatively used in the risk assessment.

VI.5 Step 4. Identification of Toxicological Parameters

Tables A-37 and A-38 list all the COCs retained in the risk assessment for the five individual areas evaluated and provide the values for the available toxicological information. The toxicological values for the nonradiological COCs presented in Table A-37 were obtained from the Integrated Risk Information System (IRIS) (EPA 2004a), the Health Effects Assessment Summary Tables (HEAST) (EPA 1997a), the Technical Background Document for

Table A-37
Toxicological Parameter Values for SWMUs 8 and 58 Nonradiological COCs

COC	RfD_o (mg/kg-d)	Confidence[a]	RfD_{inh} (mg/kg-d)	Confidence[a]	SF_o $(mg/kg\text{-}d)^{-1}$	SF_{inh} $(mg/kg\text{-}d)^{-1}$	Cancer Class[b]	ABS
Inorganic								
Arsenic	3E-4[c]	M	–	–	1.5E+0[c]	1.5E+1[c]	A	0.03[d]
Barium	7E-2[c]	M	1.4E-4[e]	–	–	–	D	0.01[d]
Beryllium	2E-3[c]	L to M	5.7E-6[c]	M	–	8.4E+0[c]	B1	0.01[d]
Cadmium	5E-4[c]	H	5.7E-5[f]	–	–	6.3E+0[c]	B1	0.001[d]
Chromium, total	1.5E+0[c]	L	–	–	–	–	D	0.01[d]
Copper	3.7E-2[f]	–	–	–	–	–	D	0.01[d]
Mercury	3E-4[e]	–	8.6E-5[c]	M	–	–	D	0.01[d]
Nickel	2E-2[c]	M	–	–	–	–	–	0.01[d]
Selenium	5E-3[c]	H	–	–	–	–	D	0.01[d]
Silver	5E-3[c]	L	–	–	–	–	D	0.01[d]
Zinc	3E-1[c]	M	–	–	–	–	D	0.01[d]
Organic								
Acetone	1E-1[c]	L	1E-1[f]	–	–	–	D	0.01[g]
2-Amino-4,6-dinitrotoluene[h]	1E-3[e]	–	1E-3[f]	–	–	–	–	0.01[g]
4-Amino-2,6-dinitrotoluene[h]	1E-3[e]	–	1E-3[f]	–	–	–	–	0.01[g]
Benzo(a)anthracene	–	–	–	–	7.3E-1[f]	3.1E-1[f]	B2	0.13[d]
Benzo(a)pyrene	–	–	–	–	7.3E+0[c]	3.1E+0[f]	B2	0.13[d]
2-Butanone	6E-1[c]	L	2.9E-1[c]	L	–	–	D	0.1[d]
Chrysene	–	–	–	–	7.3E-3[f]	3.1E-3[f]	B2	0.13[d]
Chloroform	1E-2[c]	M	8.6E-5[f]	–	6.1E-3[f]	8.1E-2[c]	B2	0.1[d]
Diethyl phthalate	8E-1[c]	L	8E-1[f]	–	–	–	D	0.1[d]
m-Dinitrobenzene	1E-4[c]	L	1E-4[f]	–	–	–	D	0.01[g]
2,4-Ditrotoluene	2E-3[c]	H	2E-3[f]	–	–	–	–	0.1[d]
Ethylbenzene	1E-1[c]	L	2.9E-1[c]	L	3.85E-3[i]	3.85E-3[i]	–	0.1[d]
bis(2-Ethylhexyl) phthalate	2E-2[f]	–	2E-2[f]	–	1.4E-2[f]	1.4E-2[f]	–	0.01[g]
Fluoranthene	4E-2[c]	L	4E-2[f]	–	–	–	D	0.13[d]
2-Hexanone	4E-2[j]	–	1.4E-3[j]	–	–	–	–	0.01[g]
HMX	5E-2[c]	L	5E-2[f]	–	–	–	D	0.1[d]
Methylene chloride	6E-2[c]	M	8.6E-1[e]	–	7.5E-3[c]	1.6E-3[c]	B2	0.1[d]
n-Nitrosodiphenylamine	–	–	–	–	4.9E-3[c]	4.9E-3[f]	B2	0.1[d]
Pentachlorophenol	3E-2[c]	M	3E-2[f]	–	1.2E-1[c]	1.2E-3[f]	B2	0.01[g]

Refer to footnotes at end of table.

Table A-37 (Concluded)
Toxicological Parameter Values for SWMUs 8 and 58 Nonradiological COCs

COC	RfD_o (mg/kg-d)	Confidence[a]	RfD_{inh} (mg/kg-d)	Confidence[a]	SF_o $(mg/kg\text{-}d)^{-1}$	SF_{inh} $(mg/kg\text{-}d)^{-1}$	Cancer Class[b]	ABS
Pyrene	3E-2[c]	L	3E-2[f]	–	–	–	D	0.1[d]
RDX	3E-3[c]	H	3E-3[f]	–	1.1E-1[c]	1.1E-1[f]	C	0.1[d]
Toluene	2E-1[c]	M	1.1E-1[c]	M	–	–	D	0.1[d]
2,4,6-Trinitrotoluene	5E-4[c]	M	5E-4[f]	–	3E-2[c]	3E-2[f]	C	0.1[d]

[a]Confidence associated with IRIS (EPA 2004a) database values. Confidence: L = low, M = medium, H = high.

[b]EPA weight-of-evidence classification system for carcinogenicity (EPA 1989) taken from IRIS (EPA 2004a):

A = Human carcinogen.
B1 = Probable human carcinogen. Limited human data are available.
B2 = Probable human carcinogen. Sufficient evidence in animals and inadequate or no evidence in humans.
C = Possible human carcinogen.
D = Not classifiable as to human carcinogenicity.

[c]Toxicological parameter values from IRIS electronic database (EPA 2004a).

[d]Toxicological parameter values from NMED (February 2004).

[e]Toxicological parameter values from HEAST (EPA 1997a).

[f]Toxicological parameter values from EPA Region 6 electronic database (EPA 2004b).

[g]Toxicological parameter values from Risk Assessment Information System (ORNL 2003).

[h]Toxicological parameter values for 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene could not be found. 2,6-dinitrotoluene was used as a surrogate.

[i]Toxicological parameter values from EPA Region 9 electronic database (EPA 2002a).

[j]Toxicological parameter values from EPA Region 3 electronic database (EPA 2002b).

ABS = Gastrointestinal absorption coefficient.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
HEAST = Health Effects Assessment Summary Tables.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
IRIS = Integrated Risk Information System.
mg/kg-d = Milligram(s) per kilogram day.
$(mg/kg\text{-}d)^{-1}$ = Per milligram per kilogram day.
NMED = New Mexico Environment Department.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RfD_{inh} = Inhalation chronic reference dose.
RfD_o = Oral chronic reference dose.
SF_{inh} = Inhalation slope factor.
SF_o = Oral slope factor.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-38
Toxicological Parameter Values for SWMUs 8 and 58 Radiological COCs Obtained from RESRAD Risk Coefficients[a]

COC	SF_o (1/pCi)	SF_{inh} (1/pCi)	SF_{ev} (g/pCi-yr)	Cancer Class[b]
Cs-137	3.20E-11	1.90E-11	2.10E-06	A
H-3	7.20E-14	9.60E-14	0	A
Th-232	3.30E-11	1.90E-08	2.00E-11	A
U-235	4.70E-11	1.30E-08	2.70E-07	A
U-238	6.20E-11	1.20E-08	6.60E-08	A

[a]Yu et al. 1993a.
[b]EPA weight-of-evidence classification system for carcinogenicity (EPA 1989): A = Human carcinogen for high dose and high dose rate (i.e., greater than 50 rem per year). For low-level environmental exposures, the carcinogenic effect has not been observed and documented.
1/pCi = One per picocurie.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
g/pCi-yr = Gram(s) per picocurie-year.
SF_{ev} = External volume exposure slope factor.
SF_{inh} = Inhalation slope factor.
SF_o = Oral (ingestion) slope factor.
SWMU = Solid Waste Management Unit.

Development of Soil Screening Levels (NMED February 2004), Risk Assessment Information System (ORNL 2003), and EPA Regions 6, 9, and 3 (EPA 2004b, EPA 2002a, EPA 2002b). Dose conversion factors (DCFs) used in determining the excess TEDE values for radiological COCs for the individual pathways are the default values provided in the RESRAD computer code (Yu et al. 1993a) as developed in the following documents:

- DCFs for ingestion and inhalation were taken from "Federal Guidance Report No. 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion" (EPA 1988).

- DCFs for surface contamination of the site were taken from DOE/EH-0070, "External Dose-Rate Conversion Factors for Calculation of Dose to the Public" (DOE 1988).

- DCFs for volume contamination (exposure to contamination deeper than the immediate surface of the site) were calculated using the methods discussed in "Dose-Rate Conversion Factors for External Exposure to Photon Emitters in Soil" (Kocher 1983) and in ANL/EAIS-8, "Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil" (Yu et al. 1993b).

VI.6 Step 5. Exposure Assessment and Risk Characterization

Section VI.6.1 describes the exposure assessment for this risk assessment. Section VI.6.2 provides the risk characterization, including the HI and excess cancer risk for both the potential nonradiological COCs and associated background for the industrial and residential land-use scenarios. The incremental TEDE and estimated incremental cancer risk are provided for the background-adjusted radiological COCs for both industrial and residential land-use scenarios.

VI.6.1 Exposure Assessment

Appendix 1 provides the equations and parameter input values used to calculate intake values and subsequent HI and excess cancer risk values for the individual exposure pathways. The appendix shows parameters for both industrial and residential land-use scenarios. The equations for nonradiological COCs are based upon the Risk Assessment Guidance for Superfund (RAGS) (EPA 1989). Parameters are based upon information from the RAGS (EPA 1989), the Technical Background Document for Development of Soil Screening Levels (NMED February 2004), as well as other EPA and NMED guidance documents. Parameters reflect the reasonable maximum exposure (RME) approach advocated by the RAGS (EPA 1989). For radiological COCs, the coded equations provided in RESRAD computer code are used to estimate the incremental TEDE and cancer risk for individual exposure pathways. Further discussion of this process is provided in the "Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD" (Yu et al. 1993a). Although the designated land-use scenario for this site is industrial, risk and TEDE values for a residential land-use scenario are also presented.

VI.6.2 Risk Characterization

This section summarizes the risk characterization for each of the SWMU 8 and 58 data sets evaluated in the risk assessment. The numbers presented include exposure from soil ingestion, dermal contact, and dust and volatile inhalation for nonradiological COCs for both the industrial and residential land-use scenarios. Although the EPA (1991) guidelines generally recommend that inhalation not be included in a residential land-use scenario, this pathway is included because of the potential for soil in the vicinity of Albuquerque, New Mexico, to be eroded and for dust to be present in predominantly residential areas. Based upon the nature of local soil, other exposure pathways are not evaluated (see Appendix 1).

SWMUs 8 and 58 Combination Area (all available analytical data)

For the SWMUs 8 and 58 Combination area, Table A-39 shows an HI of 0.94 for the nonradiological COCs and an estimated excess cancer risk of 9E-5 for the designated industrial land-use scenario. Table A-40 shows an HI of 0.05 and an estimated excess cancer risk of 6E-6 for the associated background constituents under the designated industrial land-use scenario for the SWMUs 8 and 58 Combination area.

For the radiological COCs, contribution from the direct gamma exposure pathway is included. For the industrial land-use scenario, a TEDE is calculated for an individual on the site

Table A-39
Risk Assessment Values for Nonradiological COCs,
SWMUs 8 and 58 Combination Area (all available analytical data)

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	137 J	0.54	9E-5	6.33	4E-4
Barium	988 J	0.02	–	0.19	–
Beryllium	79.3	0.04	3E-8	0.53	7E-8
Cadmium	6.02	0.01	2E-9	0.15	4E-9
Chromium, total	161 J	0.00	–	0.00	–
Copper	684	0.02	–	0.24	–
Mercury	0.585	0.00	–	0.03	–
Nickel	3960	0.21	–	2.60	–
Selenium	79 J	0.02	–	0.21	–
Silver	60.5	0.01	–	0.16	–
Zinc	225	0.00	–	0.01	–
Organics					
Acetone	0.021	0.00	–	0.00	–
2-Amino-4,6-dinitrotoluene	0.45 J	0.00	–	0.01	–
4-Amino-2,6-dinitrotoluene	0.68	0.00	–	0.01	–
Benzo(a)pyrene	0.235 J	0.00	1E-6	0.00	4E-6
Benzo(b)anthracene	0.202 J	0.00	1E-7	0.00	3E-7
2-Butanone	0.075	0.00	–	0.00	–
Chloroform	0.0025[b]	0.00	5E-9	0.00	1E-8
Chrysene	0.248 J	0.00	1E-9	0.00	4E-9
Diethyl phthalate	0.269 J	0.00	–	0.00	–
m-Dinitrobenzene	0.15	0.00	–	0.02	–
2,4-Dinitrotoluene	0.36 J	0.00	–	0.00	–
Ethylbenzene	0.0005[b]	0.00	3E-11	0.00	7E-11
bis(2-Ethylhexyl) phthalate	3.41	0.00	2E-8	0.00	8E-8
Fluoranthene	0.278 J	0.00	–	0.00	–
2-Hexanone	0.0157	0.00	–	0.00	–
HMX	5.6 J	0.00	–	0.00	–
Methylene chloride	0.0125[b]	0.00	8E-8	0.00	2E-7
n-Nitrosodiphenylamine	0.253 J	0.00	7E-10	0.00	3E-9
Pentachlorophenol	0.27 J	0.00	1E-8	0.00	5E-8
Pyrene	0.334 J	0.00	–	0.00	–
RDX	19.9 J	0.01	1E-6	0.11	5E-6
Toluene	0.025	0.00	–	0.00	–
2,4,6-Trinitrotoluene	20 J	0.06	3E-7	0.65	1E-6
Total		**0.94**	**9E-5**	**11.25**	**4E-4**

[a]EPA 1989.
[b]Maximum concentration is one-half the detection limit.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-40
Risk Assessment Values for SWMUs 8 and 58 Nonradiological Background Constituents, SWMUs 8 and 58 Combination Area (all available analytical data)

COC	Background Concentration[a] (mg/kg)	Industrial Land-Use Scenario[b]		Residential Land-Use Scenario[b]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Arsenic	9.8	0.04	6E-6	0.45	3E-5
Barium	246	0.00	–	0.05	–
Beryllium	0.75	0.00	3E-10	0.00	7E-10
Cadmium	0.64	0.00	2E-10	0.02	4E-10
Chromium, total	18.8	0.00	–	0.00	–
Copper	17.1	0.00	–	0.01	–
Mercury	0.055	0.00	–	0.00	–
Nickel	16.6	0.00	–	0.01	–
Selenium	2.7	0.00	–	0.00	–
Silver	<0.5	–	–	–	–
Zinc	52.1	0.00	–	0.00	–
Total		**0.05**	**6E-6**	**0.54**	**3E-5**

[a]Garcia November 1998, Canyon Area.
[b]EPA 1989.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
– = Information not quantified.

that results in an incremental TEDE of 1.2E+1 millirem (mrem)/year (yr). In accordance with EPA guidance found in Office of Solid Waste and Emergency Response (OSWER) Directive No. 9200.4-18 (EPA 1997b), an incremental TEDE of 15 mrem/yr is used for the probable land-use scenario (industrial in this case); the calculated dose value for the SWMUs 8 and 58 Combination area for the industrial land-use scenario is below this guideline. The estimated excess cancer risk is 1.3E-4.

The HI is 11.25 with an estimated excess cancer risk of 4E-4 for the nonradiological COCs under the residential land-use scenario (Table A-39). Table A-40 shows an HI of 0.54 and an estimated excess cancer risk of 3E-5 for the associated background constituents for the SWMUs 8 and 58 Combination area under the residential land-use scenario.

For the radiological COCs, the incremental TEDE for the residential land-use scenario is 3.1E+1 mrem/yr. The guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998b) for a complete loss of institutional controls (residential land use in this case); the calculated dose value for the SWMUs 8 and 58 Combination area for the residential land-use scenario is well below this guideline. Consequently, the SWMUs 8 and 58 Combination area is eligible for unrestricted radiological release as the residential land-use scenario results in an incremental TEDE of less than 75 mrem/yr to the on-site receptor. The estimated excess cancer risk is 4.0E-4. The excess cancer risk from the nonradiological and radiological COCs

should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants, as noted in OSWER Directive No. 9200.4-18, "Establishment of Cleanup Levels for CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act] Sites with Radioactive Contamination" (EPA 1997b). This summation is tabulated in Section VI.9.

Debris Pile and Pit Area (Features 8Y/58B)

For the Debris Pile and Pit area, Table A-41 shows an HI of 0.13 for the nonradiological COCs and an estimated excess cancer risk of 4E-7 for the designated industrial land-use scenario. Table A-42 shows an HI of 0.00 and an estimated excess cancer risk of 2E-10 for the associated background constituents under the designated industrial land-use scenario for the Debris Pile and Pit area.

For the radiological COCs, contribution from the direct gamma exposure pathway is included. For the industrial land-use scenario, a TEDE is calculated for an individual on the site that results in an incremental TEDE of 1.2E-2 mrem/yr. In accordance with EPA guidance found in OSWER Directive No. 9200.4-18 (EPA 1997b), an incremental TEDE of 15 mrem/yr is used for the probable land-use scenario (industrial in this case); the calculated dose value for the Debris Pile and Pit area for the industrial land-use scenario is well below this guideline. The estimated excess cancer risk is 1.0E-7.

The HI is 1.47 with an estimated excess cancer risk of 1E-6 for the nonradiological COCs under the residential land-use scenario (Table A-41). Table A-42 shows an HI of 0.04 and an estimated excess cancer risk of 4E-10 for the associated background constituents for the Debris Pile and Pit area under the residential land-use scenario.

For the radiological COCs, the incremental TEDE for the residential land-use scenario is 3.0E-2 mrem/yr. The guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998b) for a complete loss of institutional controls (residential land use in this case); the calculated dose value for the Debris Pile and Pit area for the residential land-use scenario is well below this guideline. Consequently, the Debris Pile and Pit area is eligible for unrestricted radiological release as the residential land-use scenario results in an incremental TEDE of less than 75 mrem/yr to the on-site receptor. The estimated excess cancer risk is 3.0E-7. The excess cancer risk from the nonradiological and radiological COCs should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants, as noted in OSWER Directive No. 9200.4-18, "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination" (EPA 1997b). This summation is tabulated in Section VI.9.

Area of Open Burning (Features 8PP/8RR)

For the Area of Open Burning, Table A-43 shows an HI of 0.00 for the nonradiological COCs and no quantified excess cancer risk for the designated industrial land-use scenario. Table A-44 shows an HI of 0.00 and no quantified estimated excess cancer risk for the associated background constituents under the designated industrial land-use scenario for the Area of Open Burning.

Table A-41
Risk Assessment Values for SWMUs 8 and 58 Nonradiological COCs, Features 8Y and 58B, Debris Pile and Pit Area

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Cadmium	1.18 J	0.00	4E-10	0.03	8E-10
Chromium, total	61.8	0.00	–	0.00	–
Copper	543	0.02	–	0.19	–
Mercury	0.258	0.00	–	0.01	–
Nickel	815	0.04	–	0.54	–
Silver	6.71 J	0.00	–	0.02	–
Zinc	225	0.00	–	0.00	–
Organic					
2-Amino-4,6-dinitrotoluene	0.45 J	0.00	–	0.01	–
4-Amino-2,6-dinitrotoluene	0.48 J	0.00	–	0.01	–
2-Butanone	0.05 J	0.00	–	0.00	–
Diethyl phthalate	0.269 J	0.00	–	0.00	–
bis(2-Ethylhexyl) phthalate	0.408 J	0.00	2E-9	0.00	9E-9
HMX	5.6 J	0.00	–	0.00	–
Methylene chloride	0.0098	0.00	6E-8	0.00	1E-7
RDX	0.27 J	0.00	2E-8	0.00	6E-8
Toluene	0.017 J	0.00	–	0.00	–
2,4,6-Trinitrotoluene	20 J	0.06	3E-7	0.65	1E-6
Total		**0.13**	**4E-7**	**1.47**	**1E-6**

[a]EPA 1989.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-42
Risk Assessment Values for SWMUs 8 and 58 Nonradiological
Background Constituents, Features 8Y and 58B, Debris Pile and Pit Area

COC	Background Concentration[a] (mg/kg)	Industrial Land-Use Scenario[b]		Residential Land-Use Scenario[b]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Cadmium	0.64	0.00	2E-10	0.02	4E-10
Chromium, total	18.8	0.00	–	0.00	–
Copper	17.1	0.00	–	0.01	–
Mercury	0.055	0.00	–	0.00	–
Nickel	16.6	0.00	–	0.01	–
Silver	<0.5	–	–	–	–
Zinc	52.1	0.00	–	0.00	–
Total		**0.00**	**2E-10**	**0.04**	**4E-10**

[a]Garcia November 1998, Canyon Area.
[b]EPA 1989.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-43
Risk Assessment Values for SWMU 8 Nonradiological COCs,
Features 8PP and 8RR, Area of Open Burning

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Selenium	4.05[b]	0.00	–	0.01	–
Total		0.00	–	0.01	–

[a]EPA 1989.
[b]Maximum concentration was one-half of the detection limit.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-44
Risk Assessment Values for SWMU 8 Nonradiological Background Constituents,
Features 8PP and 8RR, Area of Open Burning

COC	Background Concentration[a] (mg/kg)	Industrial Land-Use Scenario[b]		Residential Land-Use Scenario[b]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Selenium	2.7	0.00	–	0.01	–
Total		0.00	–	0.01	–

[a]Garcia November 1998, Canyon Area.
[b]EPA 1989.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
– = Information not available.

For the radiological COCs, contribution from the direct gamma exposure pathway is included. For the industrial land-use scenario, a TEDE is calculated for an individual on the site that results in an incremental TEDE of 1.0E-1 mrem/yr. In accordance with EPA guidance found in OSWER Directive No. 9200.4-18 (EPA 1997b), an incremental TEDE of 15 mrem/yr is used for the probable land-use scenario (industrial in this case); the calculated dose value for the Area of Open Burning for the industrial land-use scenario is well below this guideline. The estimated excess cancer risk is 9.4E-7.

The HI is 0.01 with no quantified estimated excess cancer risk for the nonradiological COCs under the residential land-use scenario (Table A-43). Table A-44 shows an HI of 0.01 and no quantified estimated excess cancer for the associated background constituents for the Area of Open Burning under the residential land-use scenario.

For the radiological COCs, the incremental TEDE for the residential land-use scenario is 2.6E-1 mrem/yr. The guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998b) for a complete loss of institutional controls (residential land use in this case); the calculated dose value for the Area of Open Burning for the residential land-use scenario is well below this guideline. Consequently, the Area of Open Burning is eligible for unrestricted radiological release as the residential land-use scenario results in an incremental TEDE of less than 75 mrem/yr to the on-site receptor. The estimated excess cancer risk is 3.0E-6. The excess cancer risk from the nonradiological and radiological COCs should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants, as noted in OSWER Directive No. 9200.4-18, "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination" (EPA 1997b). This summation is tabulated in Section VI.9.

Pile of Fire Bricks (Feature 58FF)

For the Pile of Fire Bricks, Table A-45 shows an HI of 0.67 for the nonradiological COCs and an estimated excess cancer risk of 6E-5 for the designated industrial land-use scenario. Table A-46 shows an HI of 0.05 and an estimated excess cancer risk of 6E-6 for the associated background constituents under the designated industrial land-use scenario for the Pile of Fire Bricks.

For the radiological COCs, contribution from the direct gamma exposure pathway is included. For the industrial land-use scenario, a TEDE is calculated for an individual on the site that results in an incremental TEDE of 1.0E+1 mrem/yr. In accordance with EPA guidance found in OSWER Directive No. 9200.4-18 (EPA 1997b), an incremental TEDE of 15 mrem/yr is used for the probable land-use scenario (industrial in this case); the calculated dose value for the Pile of Fire Bricks for the industrial land-use scenario is below this guideline. The estimated excess cancer risk is 9.6E-5.

The HI is 8.07 with an estimated excess cancer risk of 3E-4 for the nonradiological COCs under the residential land-use scenario (Table A-45). Table A-46 shows an HI of 0.54 and an estimated excess cancer risk of 3E-5 for the associated background constituents for the Pile of Fire Bricks under the residential land-use scenario.

For the radiological COCs, the incremental TEDE for the residential land-use scenario is 2.6E+1 mrem/yr. The guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998b) for a complete loss of institutional controls (residential land use in this case); the calculated dose value for the Pile of Fire Bricks for the residential land-use scenario is below this guideline. Consequently, the Pile of Fire Bricks is eligible for unrestricted radiological release as the residential land-use scenario resulted in an incremental TEDE of less than 75 mrem/yr to the on-site receptor. The estimated excess cancer risk is 3.1E-4. The excess cancer risk from the nonradiological and radiological COCs should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants, as noted in OSWER Directive No. 9200.4-18, "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination" (EPA 1997b). This summation is tabulated in Section VI.9.

Table A-45
Risk Assessment Values for SWMU 58 Nonradiological COCs,
Feature 58FF, Pile of Fire Bricks

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	103 J	0.40	6E-5	4.76	3E-4
Barium	585 J	0.01	–	0.11	–
Beryllium	79.3	0.04	3E-8	0.53	7E-8
Cadmium	0.875	0.00	3E-10	0.02	6E-10
Chromium, total	161 J	0.00	–	0.00	–
Copper	62.1 J	0.00	–	0.02	–
Mercury	0.273	0.00	–	0.01	–
Nickel	3960	0.21	–	2.60	–
Silver	1.0[b]	0.00	–	0.00	–
Zinc	108 J	0.00	–	0.00	–
Organic					
Chloroform	0.0025[b]	0.00	5E-9	0.00	1E-8
Total		**0.67**	**6E-5**	**8.07**	**3E-4**

[a]EPA 1989.
[b]Maximum concentration is one-half the detection limit.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table A-46
Risk Assessment Values for SWMU 58 Nonradiological Background Constituents, Feature 58FF, Pile of Fire Bricks

COC	Background Concentration[a] (mg/kg)	Industrial Land-Use Scenario[b]		Residential Land-Use Scenario[b]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Arsenic	9.8	0.04	6E-6	0.45	3E-5
Barium	246	0.00	–	0.05	–
Beryllium	0.75	0.00	3E-10	0.00	7E-10
Cadmium	0.64	0.00	2E-10	0.02	4E-10
Chromium, total	18.8	0.00	–	0.00	–
Copper	17.1	0.00	–	0.01	–
Mercury	0.055	0.00	–	0.00	–
Nickel	16.6	0.00	–	0.01	–
Silver	<0.5	–	–	–	–
Zinc	52.1	0.00	–	0.00	–
Total		**0.05**	**6E-6**	**0.54**	**3E-5**

[a]Garcia November 1998, Canyon Area.
[b]EPA 1989.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
– = Information not available.

Fire Brick Area No. 2 (Feature 58TT)

Because lead was the only nonradiological COC that exceeds its background value (it is below the EPA residential screening level) and no organic compounds were detected, these COCs are eliminated from further evaluation in the risk assessment for both the industrial and residential land-use scenarios.

For the radiological COCs, contribution from the direct gamma exposure pathway is included. For the industrial land-use scenario, a TEDE is calculated for an individual on the site that results in an incremental TEDE of 2.6E+0 mrem/yr. In accordance with EPA guidance found in OSWER Directive No. 9200.4-18 (EPA 1997b), an incremental TEDE of 15 mrem/yr is used for the probable land-use scenario (industrial in this case); the calculated dose value for Fire Brick Area No. 2 for the industrial land-use scenario is well below this guideline. The estimated excess cancer risk is 2.3E-5.

The incremental TEDE for the radiological COCs for the residential land-use scenario is 6.8E+0 mrem/yr. The guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998b) for a complete loss of institutional controls (residential land use in this case); the calculated dose value for Fire Brick Area No. 2 for the residential land-use scenario is well below this guideline. Consequently, Fire Brick Area No. 2 is eligible for unrestricted radiological release as the residential land-use scenario results in an incremental TEDE of less than 75 mrem/yr to the on-site receptor. The estimated excess cancer risk is 6.8E-5. The excess

cancer risk from the nonradiological and radiological COCs should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants, as noted in OSWER Directive No. 9200.4-18, "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination" (EPA 1997b). This summation is tabulated in Section VI.9.

VI.7 Step 6. Comparison of Risk Values to Numerical Guidelines

The human health risk assessment analysis evaluates the potential for adverse health effects for both the industrial (the designated land-use scenario for these sites) and residential land-use scenarios. This assessment also determines risks by evaluating background concentrations of the potential nonradiological COCs for both the industrial and residential land-use scenarios. The incremental risk is determined by subtracting risk associated with background from potential COC risk. These numbers are not rounded before the difference is determined and therefore may appear to be inconsistent with numbers presented in tables and within the text. For conservatism, the background constituents that do not have quantified background concentrations are assumed to have a hazard quotient (HQ) of 0.00. The following summarizes the risk values for each of the data sets evaluated in the risk assessment for SWMUs 8 and 58.

SWMUs 8 and 58 Combination Area (all available analytical data)

For the nonradiological COCs under the industrial land-use scenario, the HI is 0.94 (lower than the numerical guideline of 1 suggested in the RAGS [EPA 1989]). The excess cancer risk is 9E-5. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this area is above the suggested acceptable risk value. The incremental HI is 0.90 and the estimated incremental cancer risk is 8.30E-5 for the industrial land-use scenario. The incremental HI calculations indicate insignificant risk to human health from nonradiological COCs considering an industrial land-use scenario.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk (summarized in Appendix 2) reduces the total and estimated incremental excess cancer risk to 7E-6 and 1.05E-6, respectively. For the SWMUs 8 and 58 Combination area, the COCs that contribute to the overall risk and the UCLs of the mean concentrations calculated for these COCs are as follows:

- Arsenic, 9.91 mg/kg
- Barium, 153 mg/kg (below background and eliminated from further evaluation)
- Beryllium, 2.45 mg/kg
- Cadmium, 0.62 mg//kg (below background and eliminated from further evaluation)
- Copper, 51.2 mg/kg
- Nickel, 83.5 mg/kg
- Selenium, 6.65 mg/kg
- Silver, 2.74 mg/kg

- Benzo(a)pyrene, 0.12 mg/kg
- RDX, 2.66 mg/kg
- 2,4,6-trinitrotoluene, 1.68 mg/kg

The UCL values were calculated using only the analytical data from the areas, or sampling events, where the specific risk driver was detected (i.e., areas for which analytical data were 100 percent nondetections for a given COC were not included in the calculation). This approach is conservative because the calculation data set is not "diluted" by the inclusion of a significant number of nondetections from areas of SWMUs 8 and 58 where the specific COC is not present. Consequently, the UCL concentrations listed are higher than those calculated using the entire SWMU 8 and 58 analytical data set. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental excess cancer risks are below NMED guidelines.

For the radiological COCs under the industrial land-use scenario, the incremental TEDE is 1.2E+1 mrem/yr, which is lower than EPA's numerical guideline of 15 mrem/yr (EPA 1997b). The estimated incremental excess cancer risk is 1.3E-4.

For the nonradiological COCs under the residential land-use scenario, the calculated HI is 11.25, which is above the numerical guidance. The excess cancer risk is 4E-4. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this area is above the suggested acceptable risk value. The incremental HI is 10.7 and the estimated incremental cancer risk is 3.37E-4 for the residential land-use scenario. These incremental risk calculations indicate potential risk to human health from nonradiological COCs under a residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk and hazards (summarized in Appendix 2) reduces the total HI and estimated excess cancer risk to 0.72 and 3E-5, respectively. The incremental HI and excess cancer risk are reduced to 0.17 and 3.57E-6, respectively. For the SWMUs 8 and 58 Combination area, the COCs that contribute to the overall risk and hazards and the UCLs of the mean concentrations calculated for these COCs are as follows:

- Arsenic, 9.91 mg/kg
- Barium, 153 mg/kg (below background and eliminated from further evaluation)
- Beryllium, 2.45 mg/kg
- Cadmium, 0.62 mg//kg (below background and eliminated from further evaluation)
- Copper, 51.2 mg/kg
- Nickel, 83.5 mg/kg
- Selenium, 6.65 mg/kg
- Silver, 2.74 mg/kg
- Benzo(a)pyrene, 0.12 mg/kg
- RDX, 2.66 mg/kg
- 2,4,6-trinitrotoluene, 1.68 mg/kg

Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and the estimated incremental excess cancer risk values are below NMED guidelines.

The incremental TEDE for a residential land-use scenario from the radiological components is 3.1E+1 mrem/yr, which is significantly lower than the numerical guideline of 75 mrem/yr suggested in the SNL/NM "RESRAD Input Parameter Assumptions and Justification" (SNL/NM February 1998b). The estimated excess cancer risk is 4.0E-4.

Debris Pile and Pit Area (Features 8Y/58B)

For the nonradiological COCs under the industrial land-use scenario, the HI is 0.13 (lower than the numerical guideline of 1 suggested in the RAGS [EPA 1989]). The excess cancer risk is 4E-7. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this area is below the suggested acceptable risk value. The incremental HI is 0.13 and the estimated incremental cancer risk is 4.31E-7 for the industrial land-use scenario. These incremental risk calculations indicate insignificant risk to human health from nonradiological COCs considering an industrial land-use scenario.

For the radiological COCs under the industrial land-use scenario, the incremental TEDE is 1.2E-2 mrem/yr, which is significantly lower than EPA's numerical guideline of 15 mrem/yr (EPA 1997b). The estimated incremental excess cancer risk is 1.0E-7.

For the nonradiological COCs under the residential land-use scenario, the calculated HI is 1.47, which is above the numerical guidance. The excess cancer risk is 1E-6. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this area is below the suggested acceptable risk value. The incremental HI is 1.43 and the estimated incremental cancer risk is 1.44E-6 for the residential land-use scenario. These cancer risk calculations indicate insignificant risk to human health from nonradiological COCs under a residential land-use scenario.

Although the HI is above the NMED guideline for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to hazards (summarized in Appendix 2), nickel (383 mg/kg) and 2,4,6-trinitrotoluene (5.36 mg/kg), reduces the total HI and incremental HI to 0.71 and 0.66, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI values are below NMED guidelines. In addition, none of the individual HQs for noncarcinogens exceed 1.0 at maximum concentrations.

The incremental TEDE for a residential land-use scenario from the radiological components is 3.0E-2 mrem/yr, which is significantly lower than the numerical guideline of 75 mrem/yr suggested in the SNL/NM "RESRAD Input Parameter Assumptions and Justification" (SNL/NM February 1998b). The estimated excess cancer risk is 3.0E-7.

Area of Open Burning (Features 8PP/8RR)

For the nonradiological COCs under the industrial land-use scenario, the HI is 0.00 (lower than the numerical guideline of 1 suggested in the RAGS [EPA 1989]). There is no quantified excess cancer risk. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this area is below the suggested acceptable risk value. The incremental HI is 0.00 and there is no quantified estimated incremental cancer risk for the industrial land-use scenario. These incremental risk calculations indicate insignificant risk to human health from nonradiological COCs considering an industrial land-use scenario.

For the radiological COCs under the industrial land-use scenario, the incremental TEDE is 1.0E-1 mrem/yr, which is significantly lower than EPA's numerical guideline of 15 mrem/yr (EPA 1997b). The estimated incremental excess cancer risk is 9.4E-7.

For the nonradiological COCs under the residential land-use scenario, the calculated HI is 0.01, which is below the numerical guidance. There is no quantified excess cancer risk. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this area is below the suggested acceptable risk value. The incremental HI is 0.00 and there is no quantified estimated incremental cancer risk for the residential land-use scenario. The incremental risk calculations indicate insignificant risk to human health from nonradiological COCs under a residential land-use scenario.

The incremental TEDE for a residential land-use scenario from the radiological components is 2.6E-1 mrem/yr, which is significantly lower than the numerical guideline of 75 mrem/yr suggested in the SNL/NM "RESRAD Input Parameter Assumptions and Justification" (SNL/NM February 1998b). The estimated excess cancer risk is 3.0E-6.

Pile of Fire Bricks (Feature 58FF)

For the nonradiological COCs under the industrial land-use scenario, the HI is 0.67 (lower than the numerical guideline of 1 suggested in the RAGS [EPA 1989]). The excess cancer risk is 6E-5. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is above the suggested acceptable risk value. The incremental HI is 0.62 and the estimated incremental cancer risk is 5.86E-5 for the industrial land-use scenario. The incremental HI risk calculations indicate insignificant risk to human health from nonradiological COCs considering an industrial land-use scenario.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to excess cancer risk (summarized in Appendix 2), arsenic (11.5 mg/kg), beryllium (7.5 mg/kg), and nickel (256 mg/kg), reduces the total and estimated incremental excess cancer risk to 7E-6 and 1.08E-6, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental excess cancer risks are below NMED guidelines.

For the radiological COCs under the industrial land-use scenario, the incremental TEDE is 1.0E+1 mrem/yr, which is lower than EPA's numerical guideline of 15 mrem/yr (EPA 1997b). The estimated incremental excess cancer risk is 9.6E-5.

For the nonradiological COCs under the residential land-use scenario, the calculated HI is 8.07, which is above the numerical guidance. The excess cancer risk is 3E-4. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus the excess cancer risk for this site is above the suggested acceptable risk value. The incremental HI is 7.52 and the estimated incremental cancer risk is 2.4E-4 for the residential land-use scenario. These incremental risk calculations indicate potential risk to human health from nonradiological COCs under a residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to excess cancer risk and hazards (summarized in Appendix 2), arsenic (11.5 mg/kg), beryllium (7.5 mg/kg), and nickel (256 mg/kg), reduces the total HI and estimated excess cancer risk to 0.93 and 3E-5, respectively. The incremental HI and excess cancer risk are reduced to 0.38 and 4.39E-6, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and estimated incremental excess cancer risk values are below NMED guidelines.

The incremental TEDE for a residential land-use scenario from the radiological components is 2.6E+1 mrem/yr, which is lower than the numerical guideline of 75 mrem/yr suggested in the SNL/NM "RESRAD Input Parameter Assumptions and Justification" (SNL/NM February 1998b). The estimated excess cancer risk is 3.1E-4.

Fire Brick Area No. 2 (Feature 58TT)

Because lead was the only nonradiological COC that exceeds its background value (it is below the EPA residential screening level) and no organic compounds were detected, these COCs are eliminated from further evaluation in the risk assessment for both the industrial and residential land-use scenarios. Therefore, Fire Brick Area No. 2 poses insignificant risk to human health under both the industrial and residential land-use scenarios.

For the radiological COCs under the industrial land-use scenario, the incremental TEDE is 2.6E+0 mrem/yr, which is significantly lower than EPA's numerical guideline of 15 mrem/yr (EPA 1997b). The estimated incremental excess cancer risk is 2.3E-5.

The incremental TEDE for a residential land-use scenario from the radiological components is 6.8E+0 mrem/yr, which is significantly lower than the numerical guideline of 75 mrem/yr suggested in the SNL/NM "RESRAD Input Parameter Assumptions and Justification" (SNL/NM February 1998b). The estimated excess cancer risk is 6.8E-5.

VI.8 Step 7. Uncertainty Discussion

Because of the location, history, and future land use, there is low uncertainty in the land-use scenario and the potentially affected populations that were considered in performing the risk assessment analysis. Based upon the COCs found in near-surface soil and the location and physical characteristics of the site, there is low uncertainty in the exposure pathways relevant to the analysis.

An RME approach is used to calculate the risk assessment values. Specifically, the parameter values in the calculations are conservative and calculated intakes may be overestimated. Maximum measured values of COC concentrations are used to provide conservative results.

Table A-37 shows the uncertainties (confidence levels) in nonradiological toxicological parameter values. There is a combination of estimated values and values from the IRIS (EPA 2004a), HEAST (EPA 1997a), EPA Regions 6, 9, and 3 (EPA 2004b, EPA 2002a, EPA 2002b), Technical Background Document for Development of Soil Screening Levels (NMED February 2004), and Risk Assessment Information System (ORNL 2003). Where values are not provided, information is not available from the HEAST (EPA 1997a), IRIS (EPA 2004a), Technical Background Document for Development of Soil Screening Levels (NMED February 2004), Risk Assessment Information System (ORNL 2003), or EPA regions (EPA 2004b, EPA 2002a, EPA 2002b). Because of the conservative nature of the RME approach, uncertainties in toxicological values are not expected to change the conclusion from the risk assessment analysis.

Risk assessment values for the nonradiological COCs are within the acceptable range for human health under an industrial land-use scenario for all of the SWMUs 8 and 58 areas evaluated compared to established numerical guidance.

For the radiological COCs, the conclusion of the risk assessment is that potential effects on human health for both industrial and residential land-use scenarios are within guidelines and represent only a small fraction of the estimated 360 mrem/yr received by the average U.S. population (NCRP 1987).

The overall uncertainty in all of the steps in the risk assessment process is not considered to be significant with respect to the conclusion reached.

VI.9 Summary

SWMUs 8 and 58 contain identified COCs consisting of some inorganic, organic, and radiological compounds. Because of the location of the site, the designated industrial land-use scenario, and the nature of contamination, potential exposure pathways identified for this site include soil ingestion, dermal contact, and dust inhalation for chemical COCs and soil ingestion, dust inhalation, and direct gamma exposure for radionuclides. The same exposure pathways are applied to the residential land-use scenario. The following summarizes the human health risk assessment results for each of the areas evaluated for SWMUs 8 and 58.

SWMUs 8 and 58 Combination Area (all available analytical data)

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the HI (0.94) is lower than the accepted numerical guidance from the EPA. The estimated excess cancer risk is 9E-5. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.90, and the incremental excess cancer risk is 8.30E-5 for the industrial land-use scenario. The incremental HI risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk (summarized in Appendix 2) reduces the total and estimated incremental excess cancer risk to 7E-6 and 1.05E-6, respectively. For the SWMUs 8 and 58 Combination area, the COCs that contribute to the overall risk and the UCLs of the mean concentrations calculated for these COCs are as follows:

- Arsenic, 9.91 mg/kg
- Barium, 153 mg/kg (below background and eliminated from further evaluation)
- Beryllium, 2.45 mg/kg
- Cadmium, 0.62 mg//kg (below background and eliminated from further evaluation)
- Copper, 51.2 mg/kg
- Nickel, 83.5 mg/kg
- Selenium, 6.65 mg/kg
- Silver, 2.74 mg/kg
- Benzo(a)pyrene, 0.12 mg/kg
- RDX, 2.66 mg/kg
- 2,4,6-trinitrotoluene, 1.68 mg/kg

The UCL values were calculated using only the analytical data from the areas, or sampling events, where the specific risk driver was detected (i.e., areas for which analytical data were 100 percent nondetections for a given COC were not included in the calculation). This approach is conservative because the calculation data set is not “diluted” by the inclusion of a significant number of nondetections from areas of SWMUs 8 and 58 where the specific COC is not present. Consequently, the UCL concentrations listed are higher than those calculated using the entire SWMUs 8 and 58 analytical data set. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental excess cancer risks are below NMED guidelines.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (11.25) is above the accepted numerical guidance from the EPA. The estimated excess cancer risk is 4E-4. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 10.70 and the incremental excess cancer risk is 3.37E-4 for the residential land-use scenario. The

incremental risk calculations indicate potential risk to human health for the residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk and hazards (summarized in Appendix 2) reduces the total HI and estimated excess cancer risk to 0.72 and 3E-5, respectively. The incremental HI and excess cancer risk are reduced to 0.17 and 3.45E-6, respectively. For the SWMUs 8 and 58 Combination area, the COCs that contribute to the overall risk and hazards and the UCLs of the mean concentrations calculated for these COCs are as follows:

- Arsenic, 9.91 mg/kg
- Barium, 153 mg/kg (below background and eliminated from further evaluation)
- Beryllium, 2.45 mg/kg
- Cadmium, 0.62 mg//kg (below background and eliminated from further evaluation)
- Copper, 51.2 mg/kg
- Nickel, 83.5 mg/kg
- Selenium, 6.65 mg/kg
- Silver, 2.74 mg/kg
- Benzo(a)pyrene, 0.12 mg/kg
- RDX, 2.66 mg/kg
- 2,4,6-trinitrotoluene, 1.68 mg/kg

Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and the estimated incremental excess cancer risk values are below NMED guidelines.

The incremental TEDE and corresponding estimated cancer risk from radiological COCs are much lower than EPA guidance values. The estimated TEDE is 1.2E+1 mrem/yr for the industrial land-use scenario, which is lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997b). The corresponding estimated incremental cancer risk value is 1.3E-4 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 3.1E+1 mrem/yr with an associated risk of 4.0E-4. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998b). Therefore, the SWMUs 8 and 58 Combination area is eligible for unrestricted radiological release.

The summation of the nonradiological and radiological carcinogenic risks is tabulated in Table A-47.

Uncertainties associated with the calculations are considered small relative to the conservatism of this risk assessment analysis. Therefore, it is concluded that this area poses insignificant risk to human health under both the industrial and residential land-use scenarios.

Table A-47
Summation of Incremental Nonradiological and Radiological Risks from SWMUs 8 and 58 Combination Area (all available analytical data)

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	1.05E-6[a]	1.3E-4	1.3E-4
Residential	3.57E-6[a]	4.0E-4	4.0E-4

[a]Incremental risk calculated using the UCL of the mean concentrations for the primary risk drivers.
SWMU = Solid Waste Management Unit.
UCL = Upper confidence limit.

Debris Pile and Pit Area (Features 8Y/58B)

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the HI (0.13) is significantly lower than the accepted numerical guidance from the EPA. The estimated excess cancer risk is 4E-7. Thus, excess cancer risk is also below the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.13, and the incremental excess cancer risk is 4.31E-7 for the industrial land-use scenario. The incremental risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (1.47) is above the accepted numerical guidance from the EPA. The estimated excess cancer risk is 1E-6. Thus, excess cancer risk is below the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 1.43 and the incremental excess cancer risk is 1.44E-6 for the residential land-use scenario. The incremental excess cancer risk calculations indicate insignificant risk to human health for the residential land-use scenario.

Although the HI is above the NMED guideline for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to hazards (summarized in Appendix 2), nickel (383 mg/kg) and 2,4,6-trinitrotoluene (5.36 mg/kg), the total HI and incremental HI are reduced to 0.71 and 0.66, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental excess cancer risk values are below NMED guidelines. In addition, none of the individual HQs for noncarcinogens exceed 1.0 at maximum concentrations.

The incremental TEDE and corresponding estimated cancer risk from radiological COCs are much lower than EPA guidance values. The estimated TEDE is 1.2E-2 mrem/yr for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997b). The corresponding estimated incremental cancer risk value is 1.0E-7 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 3.0E-2 mrem/yr with an associated risk of 3.0E-7. The guideline for this scenario is 75 mrem/yr (SNL/NM

February 1998b). Therefore, the Debris Pile and Pit area is eligible for unrestricted radiological release.

The summation of the nonradiological and radiological carcinogenic risks is tabulated in Table A-48.

Table A-48
Summation of Incremental Nonradiological and Radiological Risks from SWMUs 8 and 58, Features 8Y and 58B, Debris Pile and Pit Area, Carcinogens

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	4.31E-7	1.0E-7	5.3E-7
Residential	1.44E-6	3.0E-7	1.7E-6

SWMU = Solid Waste Management Unit.

Uncertainties associated with the calculations are considered small relative to the conservatism of this risk assessment analysis. Therefore, it is concluded that this area poses insignificant risk to human health under both the industrial and residential land-use scenarios.

Area of Open Burning (Features 8PP/8RR)

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the HI (0.00) is significantly lower than the accepted numerical guidance from the EPA. There is no quantified estimated excess cancer risk. Thus, excess cancer risk is also below the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.00, and there is no quantified incremental excess cancer risk for the industrial land-use scenario. The incremental risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (0.01) is below the accepted numerical guidance from the EPA. There is no quantified estimated excess cancer risk. Thus, excess cancer risk is also below the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 0.00 and there is no quantified incremental excess cancer risk for the residential land-use scenario. The incremental risk calculations indicate insignificant risk to human health for the residential land-use scenario.

The incremental TEDE and corresponding estimated cancer risk from radiological COCs are much lower than EPA guidance values. The estimated TEDE is 1.0E-1 mrem/yr for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997b). The corresponding estimated incremental cancer risk value is 9.4E-7 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 2.6E-1 mrem/yr with an associated risk of 3.0E-6. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998b). Therefore, the Area of Open Burning is eligible for unrestricted radiological release.

The summation of the nonradiological and radiological carcinogenic risks is tabulated in Table A-49.

Table A-49
Summation of Incremental Nonradiological and Radiological Risks from SWMU 8, Features 8PP and 8RR, Area of Open Burning Carcinogens

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	0.00	9.4E-7	9.4E-7
Residential	0.00	3.0E-6	3.0E-6

SWMU = Solid Waste Management Unit.

Uncertainties associated with the calculations are considered small relative to the conservatism of this risk assessment analysis. Therefore, it is concluded that this area poses insignificant risk to human health under both the industrial and residential land-use scenarios.

Pile of Fire Bricks (Feature 58FF)

As part of the normal background screening process, lead concentrations were compared to EPA and NMED guidelines. The lead concentrations for Pile of Fire Bricks exceeded the EPA guidelines for a residential land-use scenario; thus the lead screening information is discussed here. The maximum concentration value for lead is 15,000 mg/kg. The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for a construction and industrial land-use scenario are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is greater than all the screening values. However, because the site has been adequately characterized, average concentrations are more representative of actual site conditions. The UCL of the mean concentration for lead is 988 mg/kg. The UCL of the mean concentration value for lead at this site is less than the industrial screening values but is not less than the EPA screening guidance value for a residential land-use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the HI (0.67) is lower than the accepted numerical guidance from the EPA. The estimated excess cancer risk is 6E-5. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.62 and the incremental excess cancer risk is 5.86E-5 for the industrial land-use scenario. The incremental HI risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk (summarized in Appendix 2), arsenic (11.5 mg/kg), beryllium (7.5 mg/kg), and nickel (256 mg/kg), reduces the total and estimated incremental excess cancer risk values to 7E-6 and 1.08E-6, respectively. Thus, by using realistic concentrations in the risk calculations that

more accurately depict actual site conditions, both the total and estimated incremental excess cancer risk values are below NMED guidelines.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (8.07) is above the accepted numerical guidance from the EPA. The estimated excess cancer risk is 3E-4. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 7.52 and the incremental excess cancer risk is 2.4E-4 for the residential land-use scenario. These incremental risk calculations indicate potential risk to human health for the residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk and hazards (summarized in Appendix 2), arsenic (11.5 mg/kg), beryllium (7.5 mg/kg), and nickel (256 mg/kg), reduces the total HI and estimated excess cancer risk values to 0.93 and 3E-5, respectively. The incremental HI and excess cancer risk values are reduced to 0.38 and 4.39E-6, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and estimated incremental excess cancer risk values are below NMED guidelines.

The incremental TEDE and corresponding estimated cancer risk from radiological COCs are much lower than EPA guidance values. The estimated TEDE is 1.0E+1 mrem/yr for the industrial land-use scenario, which is lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997b). The corresponding estimated incremental cancer risk value is 9.6E-5 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 2.6E+1 mrem/yr with an associated risk of 3.1E-4. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998b). Therefore, the Pile of Fire Bricks is eligible for unrestricted radiological release.

The summation of the nonradiological and radiological carcinogenic risks is tabulated in Table A-50.

Table A-50
Summation of Incremental Nonradiological and Radiological Risks from SWMU 58, Feature 58FF, Pile of Fire Bricks

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	1.08E-6[a]	9.6E-5	9.7E-5
Residential	4.39E-6[a]	3.1E-4	3.1E-4

[a]Incremental risk calculated using the UCL of the mean concentrations for the primary risk drivers.
SWMU = Solid Waste Management Unit.
UCL = Upper confidence limit.

Uncertainties associated with the calculations are considered small relative to the conservatism of this risk assessment analysis. Therefore, it is concluded that this area poses insignificant risk to human health under the industrial land-use scenario. For the residential land-use scenario, high metal concentrations, primarily lead, fail the screening risk analysis.

Fire Brick Area No. 2 (Feature 58TT)

Because lead is the only nonradiological COC that exceeds its background value (it is below the EPA residential screening level) and no organic compounds were detected, these COCs are eliminated from further evaluation in the risk assessment for the industrial land-use scenario. Therefore, the area poses insignificant risk to human health under an industrial/residential land-use scenario.

The incremental TEDE and corresponding estimated cancer risk from radiological COCs are much lower than EPA guidance values. The estimated TEDE is 2.6E+0 mrem/yr for the industrial land-use scenario, which is much lower than the EPA's numerical guidance of 15 mrem/yr (EPA 1997b). The corresponding estimated incremental cancer risk value is 2.3E-5 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is 6.8E+0 mrem/yr with an associated risk of 6.8E-5. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998b). Therefore, Fire Brick Area No. 2 is eligible for unrestricted radiological release.

The summation of the nonradiological and radiological carcinogenic risks is tabulated in Table A-51.

Table A-51
Summation of Incremental Nonradiological and Radiological Risks from SWMU 58, Feature 58TT, Fire Brick Area No. 2

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	0.00	2.3E-5	2.3E-5
Residential	0.00	6.8E-5	6.8E-5

SWMU = Solid Waste Management Unit.

Uncertainties associated with the calculations are considered small relative to the conservatism of this risk assessment analysis. Therefore, it is concluded that this area poses insignificant risk to human health under both the industrial and residential land-use scenarios.

VII. Ecological Risk Assessment

VII.1 Introduction

This section addresses the ecological risks associated with exposure to constituents of potential ecological concern (COPECs) in the soil at SWMUs 8 and 58. A component of the NMED Risk-Based Decision Tree (NMED March 1998) is to conduct an ecological assessment that corresponds with that presented in EPA's Ecological RAGS (EPA 1997c). The current methodology is tiered and contains an initial scoping assessment followed by a more detailed risk assessment. Initial components of NMED's decision tree (a discussion of DQOs, data assessment, and evaluations of bioaccumulation as well as fate and transport potential) are addressed in previous sections of this report. Following the completion of the scoping assessment, a determination is made as to whether a more detailed examination of potential

ecological risk is necessary. If deemed necessary, the scoping assessment proceeds to a risk assessment whereby a more quantitative estimate of ecological risk is conducted. Although this assessment is conservative in the estimation of ecological risks, ecological relevance and professional judgment are also used as recommended by the EPA (1998) to ensure that predicted exposures of selected ecological receptors reflect those reasonably expected to occur at the site.

VII.2 Scoping Assessment

The scoping assessment focuses primarily on the likelihood of exposure of biota at, or adjacent to, the site to constituents associated with site activities. Included in this section are an evaluation of existing data and a comparison of maximum detected concentrations to background concentrations, examination of bioaccumulation potential, and fate and transport potential. A scoping risk-management decision (Section VII.2.4) summarizes the scoping results and assesses the need for further examination of potential ecological impacts.

VII.2.1 Data Assessment

As indicated in Section IV (Tables A-22, A-24, A-25, A-27, A-28, A-30, A-32, A-33, A-34, and A-35), constituents in soil within the 0- to 5-foot depth interval that are identified as COPECs for this site (for all areas evaluated) include the following:

- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium, total
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Zinc
- Acetone
- 2-Amino-4,6-dinitrotoluene
- 4-Amino-2,6-dinitrotoluene
- Benzo(a)pyrene
- Benzo(b)anthracene
- 2-Butanone
- Chloroform
- Chrysene
- Diethyl phthalate
- m-Dinitrobenzene
- 2,4-Dinitrotoluene

- Ethylbenzene
- bis(2-Ethylhexyl) phthalate
- Fluoranthene
- 2-Hexanone
- HMX
- Methylene chloride
- n-Nitrosodiphenylamine
- Pentachlorophenol
- Pyrene
- RDX
- Toluene
- 2,4,6-Trinitrotoluene
- Cs-137
- Th-232
- U-235
- U-238

VII.2.2 Bioaccumulation

Among the COPECs listed in Section VII.2.1, the following are considered to have bioaccumulation potential in aquatic environments (Tables A-22, A-24, A-25, A-27, A-28, A-30, A-32, A-33, A-34, and A-35):

- Arsenic
- Barium
- Cadmium
- Lead
- Mercury
- Nickel
- Selenium
- Zinc
- Benzo(a)pyrene
- Benzo(b)anthracene
- Chrysene
- Diethyl phthalate
- m-Dinitrobenzene
- 2,4-Dinitrotoluene
- Fluoranthene
- n-Nitrosodiphenylamine
- Pentachlorophenol
- Pyrene
- 2,4,6-Trinitrotoluene
- Cs-137
- Th-232

- U-235
- U-238

However, as directed by the NMED (March 1998), bioaccumulation for inorganic constituents is assessed exclusively based upon maximum reported bioconcentration factors (BCFs) for aquatic species. Because only aquatic BCFs are used to evaluate the bioaccumulation potential for metals, bioaccumulation in terrestrial species is likely to be overpredicted.

VII.2.3 Fate and Transport Potential

The potential for the COPECs to migrate from the source of contamination to other media or biota is discussed in Section V. As noted in Table A-36 (Section V), wind, surface water, and biota (food chain uptake) are expected to be of low significance as transport mechanisms for COPECs at this site. Degradation, transformation, and radiological decay of the COPECs are also expected to be of low significance.

VII.2.4 Scoping Risk-Management Decision

Based upon information gathered through the scoping assessment, it is concluded that complete ecological pathways may be associated with SWMUs 8 and 58 and that COPECs also exist at the sites. As a consequence, a detailed ecological risk assessment is deemed necessary to predict the potential level of ecological risk associated with the site.

VII.3 Risk Assessment

As concluded in Section VII.2.4, both complete ecological pathways and COPECs are associated with SWMUs 8 and 58. The ecological risk assessment performed for the sites involves a quantitative estimate of current ecological risks using exposure models in association with exposure parameters and toxicity information obtained from the literature. The estimation of potential ecological risks is conservative to ensure that ecological risks are not underpredicted.

Components within the risk assessment include the following:

- Problem Formulation—sets the stage for the evaluation of potential exposure and risk.
- Exposure Estimation—provides a quantitative estimate of potential exposure.
- Ecological Effects Evaluation—presents benchmarks used to gauge the toxicity of COPECs to specific receptors.
- Risk Characterization—characterizes the ecological risk associated with exposure of the receptors to environmental media at the site.

- Uncertainty Assessment—discusses uncertainties associated with the estimation of exposure and risk.

- Risk Interpretation—evaluates ecological risk in terms of HQs and ecological significance.

- Risk Assessment Scientific/Management Decision Point—presents the decision to risk managers based upon the results of the risk assessment.

VII.3.1 Problem Formulation

Problem formulation is the initial stage of the risk assessment that provides the introduction to the risk evaluation process. Components that are addressed in this section include a discussion of ecological pathways and the ecological setting, identification of COPECs, and selection of ecological receptors. The conceptual model, ecological food webs, and ecological endpoints (other components commonly addressed in an ecological risk assessment) are presented in "Predictive Ecological Risk Assessment Methodology, Environmental Restoration Program, Sandia National Laboratories, New Mexico" (IT July 1998) and are not duplicated here.

VII.3.1.1 Ecological Pathways and Setting

SWMUs 8 and 58 are comprised of a total of approximately 285 acres. The sites are located in the Pinon Juniper zone, which is unpaved and open to use by wildlife. No threatened or endangered species exist at these sites (IT February 1995), and no surface-water bodies, seeps, or springs are associated with the sites.

Complete ecological pathways may exist at these sites through the exposure of plants and wildlife to COPECs in the soil. It is assumed that direct uptake of COPECs from soil is the major route of exposure for plants and that exposure of plants to wind-blown soil is minor. Exposure modeling for the wildlife receptors is limited to the food and soil ingestion pathways and external radiation. Because of the lack of surface water at this site, exposure to COPECs through the ingestion of surface water is considered insignificant. Inhalation and dermal contact also are considered insignificant pathways with respect to ingestion (Sample and Suter 1994). Groundwater is not expected to be affected by COCs at this site.

VII.3.1.2 COPECs

HE testing and disposal of the debris are the primary sources of COPECs at SWMUs 8 and 58. All COPECs identified for this site are listed in Section VII.2. The COPECs include both radiological and nonradiological analytes. The analytes were screened against background concentrations and those that exceeded the approved SNL/NM background screening levels (Garcia November 1998, Dinwiddie September 1997) for the area were considered to be COPECs. All organic analytes detected in the soil and inorganic constituents with uncertain background levels were retained as COPECs. Nonradiological inorganic constituents that are essential nutrients, such as iron, magnesium, calcium, potassium, and sodium, are not included in this risk assessment as set forth by the EPA (1989). In order to provide conservatism, this

ecological risk assessment is based upon the maximum soil concentrations of the COPECs measured in the upper 5 feet of soil at this site. Tables A-22, A-24, A-25, A-27, A-28, A-30, A-32, A-33, A-34, and A-35 present the maximum concentrations for the COPECs at SWMUs 8 and 58 and at the specific features that are assessed on an individual basis.

VII.3.1.3 Ecological Receptors

A nonspecific perennial plant is selected as the receptor to represent plant species at the site (IT July 1998). Vascular plants are the principal primary producers at the site and are key to the diversity and productivity of the wildlife community associated with the site. The deer mouse (*Peromyscus maniculatus*) and the burrowing owl (*Speotyto cunicularia*) are used to represent wildlife use. Because of its opportunistic food habits, the deer mouse is used to represent a mammalian herbivore, omnivore, and insectivore. The burrowing owl is represents a top predator at this site. The burrowing owl is present at SNL/NM and is designated a species of management concern by the U.S. Fish and Wildlife Service in Region 2, which includes the state of New Mexico (USFWS September 1995).

VII.3.2 Exposure Estimation

For the nonradiological COPECs, direct uptake from the soil is considered the only significant route of exposure for terrestrial plants. Exposure modeling for the wildlife receptors is limited to food and soil ingestion pathways. Inhalation and dermal contact are considered insignificant pathways with respect to ingestion (Sample and Suter 1994). Drinking water is also considered an insignificant pathway because of the lack of surface water at this site. The deer mouse is modeled under three dietary regimes: as an herbivore (100 percent of its diet as plant material), as an omnivore (50 percent of its diet as plants and 50 percent as soil invertebrates), and as an insectivore (100 percent of its diet as soil invertebrates). The burrowing owl is modeled as a strict predator on small mammals (100 percent of its diet as deer mice). Because the exposure in the burrowing owl from a diet consisting of equal parts of herbivorous, omnivorous, and insectivorous mice would be equivalent to the exposure consisting of only omnivorous mice, the diet of the burrowing owl is modeled with intake of omnivorous mice only. Both species are modeled with soil ingestion comprising 2 percent of the total dietary intake. Table A-52 presents the species-specific factors used in modeling exposures in the wildlife receptors. Justification for use of the factors presented in this table is described in the ecological risk assessment methodology document (IT July 1998).

Although home range is also included in this table, exposures for this risk assessment are modeled using an area use factor of 1.0, implying that all food items and soil ingested come from the area being investigated. The maximum COPEC concentrations measured in the upper 5 feet of soil were used to conservatively estimate potential exposures and risks to plants and wildlife at this site.

For the radiological dose-rate calculations, the deer mouse is modeled as an herbivore (100 percent of its diet as plants), and the burrowing owl is modeled as a strict predator on small mammals (100 percent of its diet as deer mice). Both are modeled with soil ingestion comprising 2 percent of the total dietary intake. Receptors are exposed to radiation both internally and externally from Cs-137, Th-232, U-235, and U-238. Internal and external dose

Table A-52
Exposure Factors for Ecological Receptors at SWMUs 8 and 58

Receptor Species	Class/Order	Trophic Level	Body Weight (kg)[a]	Food Intake Rate (kg/day)[b]	Dietary Composition[c]	Home Range (acres)
Deer Mouse (*Peromyscus maniculatus*)	Mammalia/ Rodentia	Herbivore	2.39E-2[d]	3.72E-3	Plants: 100% (+ Soil at 2% of intake)	2.7E-1[e]
Deer Mouse (*Peromyscus maniculatus*)	Mammalia/ Rodentia	Omnivore	2.39E-2[d]	3.72E-3	Plants: 50% Invertebrates: 50% (+ Soil at 2% of intake)	2.7E-1[e]
Deer Mouse (*Peromyscus maniculatus*)	Mammalia/ Rodentia	Insectivore	2.39E-2[d]	3.72E-3	Invertebrates: 100% (+ Soil at 2% of intake)	2.7E-1[e]
Burrowing owl (*Speotyto cunicularia*)	Aves/ Strigiformes	Carnivore	1.55E-1[f]	1.73E-2	Rodents: 100% (+ Soil at 2% of intake)	3.5E+1[g]

[a]Body weights are in kg wet weight.
[b]Food intake rates are estimated from the allometric equations presented in Nagy (1987). Units are kg dry weight per day.
[c]Dietary compositions are generalized for modeling purposes. Default soil intake value of 2 percent of food intake.
[d]Silva and Downing 1995.
[e]EPA (1993), based upon the average home range measured in semiarid shrubland in Idaho.
[f]Dunning 1993.
[g]Haug et al. 1993.
EPA = U.S. Environmental Protection Agency.
kg = Kilogram(s).
SWMU = Solid Waste Management Unit.

rates to the deer mouse and the burrowing owl are approximated using modified dose-rate models from the DOE (1995) as presented in the ecological risk assessment methodology document for the SNL/NM ER Project (IT July 1998). Radionuclide-dependent data for the dose-rate calculations were obtained from Baker and Soldat (1992). The external dose-rate model examines the total-body dose rate to a receptor residing in soil exposed to radionuclides. The soil surrounding the receptor is assumed to be an infinite medium uniformly contaminated with gamma-emitting radionuclides. The external dose-rate model is the same for both the deer mouse and the burrowing owl. The internal total-body dose-rate model assumes that a fraction of the radionuclide concentration ingested by a receptor is absorbed by the body and concentrated at the center of a spherical body shape. This provides for a conservative estimate for absorbed dose. This concentrated radiation source at the center of the body of the receptor is assumed to be a "point" source. Radiation emitted from this point source is absorbed by the body tissues to contribute to the absorbed dose. Alpha and beta emitters are assumed to transfer 100 percent of their energy to the receptor as they pass through tissues. Gamma-emitting radionuclides transfer only a fraction of their energy to the tissues because gamma rays interact less with matter than do beta or alpha emitters. The external and internal dose-rate results are summed to calculate a total dose rate from exposure to Cs-137, Th-232, U-235, and U-238 in soil.

Table A-53 provides the transfer factors used in modeling the concentrations of COPECs through the food chain for all the COPECs at all the areas evaluated at SWMUs 8 and 58. Table A-54 presents maximum concentrations in soil and derived concentrations in tissues of the various food chain elements that are used to model dietary exposures for each of the wildlife receptors at all the areas evaluated.

VII.3.3 Ecological Effects Evaluation

Table A-55 shows benchmark toxicity values for the plant and wildlife receptors for all of the COPECs evaluated. For plants, the benchmark soil concentrations are based upon the lowest-observed-adverse-effect level (LOAEL). For wildlife, the toxicity benchmarks are based upon the no-observed-adverse-effect level (NOAEL) for chronic oral exposure in a taxonomically similar test species. Sufficient toxicity information was not available to estimate the LOAELs or NOAELs for some COPECs.

The benchmark used for exposure of terrestrial receptors to radiation was 0.1 rad/day. This value has been recommended by the International Atomic Energy Agency (IAEA 1992) for the protection of terrestrial populations. Because plants and insects are less sensitive to radiation than vertebrates (Whicker and Schultz 1982), the dose of 0.1 rad/day should also protect other groups within the terrestrial habitat of SWMUs 8 and 58.

Table A-53
Transfer Factors Used in Exposure Models for COPECs at SWMUs 8 and 58

COPEC	Soil-to-Plant Transfer Factor	Soil-to-Invertebrate Transfer Factor	Food-to-Muscle Transfer Factor
Inorganic			
Arsenic	4.0E-2[a]	1.0E+0[b]	2.0E-3[a]
Barium	1.5E-1[a]	1.0E+0[b]	2.0E-4[c]
Beryllium	1.0E-2[a]	1.0E+0[b]	1.0E-3[a]
Cadmium	5.5E-1[a]	6.0E-1[d]	5.5E-4[a]
Chromium, total	4.0E-1[c]	1.3E-1[e]	3.0E-2[c]
Copper	8.0E-1[f]	2.5E-1[d]	1.0E-2[a]
Lead	9.0E-2[c]	4.0E-2[d]	8.0E-4[c]
Mercury	1.5E-1[a]	1.0E+0[b]	2.0E-4[c]
Nickel	2.0E-1[c]	3.8E-1[e]	6.0E-3[a]
Selenium	5.0E-1[c]	1.0E+0[b]	1.0E-1[c]
Silver	1.0E+0[c]	2.5E-1[d]	5.0E-3[c]
Zinc	1.5E+0[a]	3.0E-1[d]	1.0E-1[a]
Organic[g]			
Acetone	5.3E+1	1.3E+1	1.0E-8
2-Amino-4,6-dinitrotoluene	2.9E+0	1.6E+1	1.9E-6
4-Amino-2,6-dinitrotoluene	2.9E+0	1.6E+1	1.9E-6
Benzo(a)pyrene	1.1E-02	2.7E+1	3.8E-2
Benzo(b)anthracene	6.2E-3	2.8E+1	1.1E-1
2-Butanone	2.6E+1	1.4E+1	5.3E-6
Chloroform	3.0E+0	1.6E+1	1.8E-6
Chrysene	1.5E-2	2.6E+1	2.3E-2
Diethyl phthalate	1.5E+0	1.8E+1	6.6E-6
m-Dinitrobenzene	5.3E+0	1.6E+1	6.4E-7
2,4-Dinitrotoluene	2.8E+0	1.7E+1	2.0E-6
Ethylbenzene	5.9E-1	1.9E+1	3.3E-5
bis(2-Ethylhexyl) phthalate	2.4E-3	3.1E+1	6.4E-1
Fluoranthene	3.2E-2	2.4E+1	5.9E-3
2-Hexanone	6.2E+0	1.5E+1	4.9E-7
HMX	2.7E+1	1.4E+1	3.4E-8
Methylene chloride	7.3E+0	1.5E+1	3.6E-7
n-Nitrosodiphenylamine	6.0E-1	1.9E+1	3.2E-5
Pentachlorophenol	4.4E-2	2.4E+1	3.3E-3
Pyrene	3.3E-2	2.4E+1	5.8E-3
RDX	1.2E+1	1.5E+1	1.5E-7
Toluene	1.0E+0	1.8E+1	1.3E-5
2,4,6-Trinitrotoluene	4.6E+0	1.6E+1	8.3E-7

[a]Baes et al. 1984.
[b]Default value.
[c]NCRP January 1989.
[d]Stafford et al. 1991.
[e]Ma 1982.
[f]IAEA 1994.
[g]Soil-to-plant and food-to-muscle transfer factors from equations developed in Travis and Arms (1988). Soil-to-invertebrate transfer factors from equations developed in Connell and Markwell (1990). All three equations based upon relationship of the transfer factor to the Log K_{ow} value of compound.

Table A-53 (Concluded)
Transfer Factors Used in Exposure Models for COPECs at SWMUs 8 and 58

COPEC = Constituent of potential ecological concern.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
IAEA = International Atomic Energy Agency.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
NCRP = National Council on Radiation Protection and Measurements.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.

Table A-54
Media Concentrations[a] for COPECs at SWMUs 8 and 58 for All Areas Evaluated

COPEC	Soil (Maximum)[a]	Plant Foliage[b]	Soil Invertebrate[b]	Deer Mouse Tissues[c]
SWMUs 8 and 58 Combined (all available analytical data)				
Inorganic				
Arsenic	3.8E+1	1.5E+0	3.8E+1	1.3E-1
Barium	4.7E+2	7.0E+1	4.7E+2	1.7E-1
Beryllium	1.5E+0	1.5E-2	1.5E+0	2.5E-3
Cadmium	6.0E+0	3.3E+0	3.6E+0	6.2E-3
Chromium, total	8.4E+1	3.4E+0	1.1E+1	8.3E-1
Copper	6.8E+2	5.5E+2	1.7E+2	1.2E+1
Lead	4.2E+3	5.0E+2	2.2E+2	1.2E+0
Mercury	5.9E-1	5.9E-1	5.9E-1	4.7E-1
Nickel	2.5E+2	5.0E+1	9.6E+1	1.5E+0
Selenium	5.9E+1	3.0E+1	5.9E+1	1.4E+1
Silver	6.1E+1	6.1E+1	1.5E+1	6.1E-1
Zinc	2.3E+2	3.4E+2	6.8E+1	6.5E+1
Organic				
Acetone	2.1E-2	1.1E+0	2.7E-1	2.3E-8
2-Amino-4,6-dinitrotoluene	4.5E-1	1.3E+0	7.4E+0	2.5E-5
4-Amino-2,6-dinitrotoluene	6.8E-1	2.0E+0	1.1E+1	3.8E-5
Benzo(a)pyrene	2.4E-1	2.7E-3	6.2E+0	3.7E-1
Benzo(b)anthracene	2.0E-1	1.2E-3	5.7E+0	1.0E+0
2-Butanone	1.1E-3	2.8E-2	1.4E-2	2.4E-9
Chloroform	2.5E-3	7.5E-3	4.1E-2	1.3E-7
Chrysene	2.5E-1	3.7E-3	6.4E+0	2.4E-1
Diethyl phthalate	2.7E-1	3.9E-1	4.7E+0	5.2E-5
m-Dinitrobenzene	1.5E-1	8.0E-1	2.3E+0	3.1E-6
2,4-Dinitrotoluene	3.6E-1	1.0E+0	5.9E+0	2.2E-5
Ethylbenzene	5.0E-4	2.9E-4	9.5E-3	5.0E-7
bis(2-Ethylhexyl) phthalate	3.4E-1	5.3E-4	1.1E+1	2.2E+1
Fluoranthene	2.8E-1	1.6E-2	6.4E+0	2.1E-2
2-Hexanone	1.6E-2	9.7E-2	2.4E-1	2.6E-7
HMX	5.6E+0	1.5E+2	7.6E+1	1.2E-5
Methylene chloride	1.3E-2	9.2E-2	1.9E-1	1.6E-7
n-Nitrosodiphenylamine	2.5E-1	1.1E+0	4.0E+0	7.0E-6
Pentachlorophenol	2.7E-1	1.2E-2	6.4E+0	3.3E-2
Pyrene	3.3E-1	1.1E-2	8.1E+0	7.3E-2
RDX	2.0E+1	2.4E+2	2.9E+2	1.2E-4
Toluene	4.6E-3	4.6E-3	8.3E-2	1.8E-6
2,4,6-Trinitrotoluene	2.0E+1	9.2E+1	3.2E+2	5.3E-4
Debris Pile and Pit (8Y/58B)				
Inorganic				
Cadmium	1.18E+0[d]	6.5E-1	7.1E-1	1.2E-3
Chromium, total	6.18E+1	2.5E+0	8.0E+0	6.1E-1
Copper	5.43E+2	4.3E+2	1.4E+2	9.2E+0

Refer to footnotes at end of table.

Table A-54 (Concluded)
Media Concentrations[a] for COPECs at SWMUs 8 and 58 for All Areas Evaluated

COPEC	Soil (Maximum)[a]	Plant Foliage[b]	Soil Invertebrate[b]	Deer Mouse Tissues[c]
Lead	5.85E+1[d]	5.3E+0	2.3E+0	1.2E-2
Mercury	2.58E-1	2.6E-1	2.6E-1	2.1E-1
Nickel	2.52E+2	5.0E+1	9.6E+1	1.5E+0
Silver	6.71E+0[d]	6.7E+0	1.7E+0	6.8E-2
Zinc	2.25E+2	3.4E+2	6.8E+1	6.5E+1
Organic				
2-Amino-4,6-dinitrotoluene	4.5E-1[d]	1.3E+0	7.4E+0	2.5E-5
4-Amino-2,6-dinitrotoluene	4.8E-1[d]	1.4E+0	7.9E+0	2.7E-5
Diethyl phthalate	2.69E-1[d]	3.9E-1	4.7E+0	5.2E-5
HMX	5.6E+0[d]	1.5E+2	7.6E+1	1.2E-5
RDX	2.7E-1[d]	3.3E+0	3.9E+0	1.6E-6
2,4,6-Trinitrotoluene	2.0E+1[d]	9.2E+1	3.2E+2	5.3E-4
Area of Open Burning (8PP/8RR)				
Inorganic				
Selenium	4.05E+0[e]	2.0E+0	4.1E+0	1.3E+0
Pile of Fire Bricks (58FF)				
Inorganic				
Barium	3.18E+2	4.8E+1	3.2E+2	1.2E-1
Chromium (total)	4.35E+1	1.7E+0	5.7E+0	4.3E-1
Copper	3.8E+1	3.0E+1	9.5E+0	6.5E-1
Lead	1.2E-2	5.0E+2	2.2E+2	1.2E+0
Nickel	6.11E+1	1.2E+1	2.3E+1	3.6E-1
Silver	1.0E+0	1.0E+0	2.5E-1	1.0E-2
Zinc	7.02E+1	1.1E+2	2.1E+1	2.0E+1
Organic				
Chloroform	2.5E-3.[e]	7.5E-3	4.1E-2	1.3E-7
Pile of Fire Bricks Number 2 (58TT)				
Inorganic				
Lead	788E+1	7.1E+0	3.2E+0	1.7E-2

[a]In milligrams per kilogram. All biotic media are based upon dry weight of the media. Soil concentration measurements are assumed to have been based upon dry weight. Values have been rounded to two significant digits after calculation.
[b]Product of the soil concentration and the corresponding transfer factor.
[c]Based upon the deer mouse with an omnivorous diet. Product of the average concentration ingested in food and soil times the food-to-muscle transfer factor times a wet weight-dry weight conversion factor of 3.125 (EPA 1993).
[d]Estimated value.
[e]Analyte not detected. Maximum concentration is one-half of the detection limit.
COPEC = Constituent of potential ecological concern.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.

Table A-55
Toxicity Benchmarks for Ecological Receptors at SWMUs 8 and 58

COPEC	Plant Benchmark[a,b]	Mammalian NOAELs			Avian NOAELs		
		Mammalian Test Species[c,d]	Test Species NOAEL[d,e]	Deer Mouse NOAEL[e,f]	Avian Test Species[d]	Test Species NOAEL[d,e]	Burrowing Owl NOAEL[e,g]
Inorganic							
Arsenic	10	mouse	0.126	0.133	mallard	5.14	5.14
Barium	500	rat[h]	5.1	10.5	chicks	20.8	20.8
Beryllium	10	rat	0.66	1.29	–	–	–
Cadmium	3	rat[i]	1	1.9	mallard	1.45	1.45
Chromium, total	1	rat	2,737	5,354	black duck	1	1
Copper	100	mink	11.7	29.8	chicks	47	47
Cyanide	–	rat[j]	68.7	126	–	–	–
Lead	50	rat	8	15.6	American kestrel	3.85	3.85
Mercury (organic)	0.3	rat	0.03	0.06	mallard	0.0064	0.0064
Mercury (inorganic)	0.3	mouse	13.2	14.0	Japanese quail	0.45	0.45
Nickel	30	rat	40	78.2	mallard	77.4	77.4
Selenium	1	rat	0.2	0.39	screech owl	0.44	0.44
Silver	2	rat	17.8[k]	34.8	–	–	–
Zinc	50	rat	160	313	chicken	14.5	14.5
Organic							
Acetone	–	rat	10	19.56	–	–	–
2-Amino-4,6-dinitrotoluene	80	rat	2.81	5.50	–	–	–
4-Amino-2,6-dinitrotoluene	–	rat	1.93	3.78	–	–	–
Benzo(a)pyrene	18	mouse	1	1.058	–	–	–
Benzo(b)anthracene	18	mouse	1	1.058	–	–	–
2-Butanone	–	rat	1,771	3,464	–	–	–
Chloroform	–	rat	15	29	–	–	–
Chrysene	18	mouse	1	1.058	–	–	–
Diethyl phthalate	–	mouse	75.3	79.7	–	–	–

Refer to footnotes at end of table.

Table A-55 (Continued)
Toxicity Benchmarks for Ecological Receptors at SWMUs 8 and 58

COPEC	Plant Benchmark[a,b]	Mammalian NOAELs			Avian NOAELs		
		Mammalian Test Species[c,d]	Test Species NOAEL[d,e]	Deer Mouse NOAEL[e,f]	Avian Test Species[d]	Test Species NOAEL[d,e]	Burrowing Owl NOAEL[e,g]
m-Dinitrobenzene	–	rat	0.113	0.221	–	–	–
2,4-Dinitrotoluene	–	rat	3.8	7.43	–	–	–
Ethylbenzene	–	rat	291	569.3	–	–	–
bis(2-Ethylhexyl) phthalate	–	mouse	18.3	19.37	ringed dove	1.1	
Fluoranthene	18	mouse	12.5	13.23	–	–	–
2-Hexanone	–	rat	1676	3279	–	–	–
HMX	–	mouse[l]	3	2.97	–	–	–
Methylene chloride	–	rat	5.85	11.44	–	–	–
n-Nitrosodiphenylamine	–	rat	4.23	8.275	–	–	–
Pentachlorophenol	–	rat	0.24	0.469	–	–	–
Pyrene	18	mouse	7.5	7.939	–	–	–
RDX	100	mouse[m]	7	7.76	–	–	–
Toluene	200	mouse	26	27.52	–	–	–
2,4,6-Trinitrotoluene	30	rat[n]	1.6	3.06	–	–	–

[a]In mg/kg soil dry weight.
[b]Efroymson et al. 1997.
[c]Body weights (in kg) for the NOAEL conversion are as follows: lab mouse, 0.030; lab rat, 0.350; mink, 1.0 (except where noted).
[d]Sample et al. (1996), except where noted.
[e]In mg/kg body weight per day.
[f]Based upon NOAEL conversion methodology presented in Sample et al. (1996), using a deer mouse body weight of 0.0239 kg and a mammalian scaling factor of 0.25.
[g]Based upon NOAEL conversion methodology presented in Sample et al. (1996). The avian scaling factor of 0.0 was used, making the NOAEL independent of body weight.
[h]Body weight: 0.435.
[i]Body weight: 0.303 kg.
[j]Body weight: 0.273 kg.
[k]Based upon a rat lowest-observed-adverse-effect level of 89 mg/kg/day (EPA 2004a) and an uncertainty factor of 0.2.

Table A-55 (Concluded)
Toxicity Benchmarks for Ecological Receptors at SWMUs 8 and 58

[l]Body weight: 0.023 kg.
[m]Body weight: 0.036 kg.
[n]Body weight: 0.318 kg.
COPEC = Constituent of potential ecological concern.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
kg = Kilogram(s).
mg/kg = Milligram(s) per kilogram.
NOAEL = No-observed-adverse-effect level.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
– = Insufficient toxicity data.

VII.3.4 Risk Characterization

This section summarizes the ecological risk characterization for each of the SWMU 8 and 58 areas evaluated.

SWMUs 8 and 58 Combination Area (all available analytical data)

Maximum concentrations in soil (Tables A-22 and A-30) and estimated dietary exposures are compared to plant and wildlife benchmark values, respectively. Table A-56 presents the results of these comparisons. HQs are used to quantify the comparison with benchmarks for plant and wildlife exposure. The HQs that exceed unity are arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc for plants; arsenic, barium, copper, lead, mercury, selenium, m-dinitrobenzene, HMX, pentachlorophenol, RDX, and 2,4,6-dinitrotoluene for the deer mice; and lead, mercury, selenium, and bis(2-ethylhexyl) phthalate for the burrowing owl. Because of a lack of sufficient toxicity information, the HQ for plants could not be determined for 14 of the organic COPECs; HQs for the burrowing owl HQs could not be determined for beryllium, silver, and all of the organic COPECs except bis(2-ethylhexyl) phthalate. As directed by the NMED, HI values are calculated for each of the receptors (the HI is the sum of chemical-specific HQs for all pathways for a given receptor). Total HI values are greater than unity for all of the potential receptors, with a maximum HI of 2.9E+2 for plants.

Tables A-57 and A-58 summarize the internal and external dose-rate model results for Cs-137, Th-232, U-235, and U-238 for the deer mouse and burrowing owl, respectively. The total radiation dose rate to the deer mouse is predicted to be 1.6E-2 rad/day and that for the burrowing owl is 1.6E-2 rad/day. The dose rates for the deer mouse and the burrowing owl are lower than the benchmark of 0.1 rad/day.

Debris Pile and Pit Area (Features 8Y/58B)

Maximum concentrations in soil (Tables A-24 and A-32) and estimated dietary exposures are compared to plant and wildlife benchmark values, respectively. Table A-59 presents the results of these comparisons. HQs are used to quantify the comparison with benchmarks for plant and wildlife exposure. The HQs that exceed unity are chromium, copper, lead, nickel, silver, and zinc for plants; copper, HMX, and 2,4,6-trinitrotoluene for the deer mice; and organic mercury for the burrowing owl. Because of a lack of sufficient toxicity information, the HQ for plants could not be determined for 4-amino-2,6-dinitrotoluene, diethylphthalate, and HMX. Similarly for the burrowing owl, HQs could not be determined for silver and all of the organic compounds. As directed by the NMED, HI values are calculated for each of the receptors (the HI is the sum of chemical-specific HQs for all pathways for a given receptor). Total HI values are greater than unity for all of the potential receptors, with a maximum HI of 87 for plants.

Tables A-60 and A-61 summarize the internal and external dose-rate model results for U-235 for the deer mouse and burrowing owl, respectively. The total radiation dose rate to the deer mouse is predicted to be 6.5E-6 rad/day and that for the burrowing owl is 5.0E-6 rad/day. The dose rates for the deer mouse and the burrowing owl are lower than the benchmark of 0.1 rad/day.

Table A-56
HQs for Ecological Receptors at SWMUs 8 and 58 Combination Area
(all available analytical data)

COPEC	Plant HQ[a]	Deer Mouse HQ[a] (Herbivorous)	Deer Mouse HQ[a] (Omnivorous)	Deer Mouse HQ[a] (Insectivorous)	Burrowing Owl HQ[a]
Inorganic					
Arsenic	**3.8E+0**	**2.7E+0**	**2.4E+1**	**4.5E+1**	1.9E-2
Barium	9.3E-1	**1.2E+0**	**4.1E+0**	**7.0E+0**	5.1E-2
Beryllium	1.5E-1	5.4E-3	9.5E-2	1.8E-1	–
Cadmium	**2.0E+0**	2.8E-1	3.0E-1	3.1E-1	9.7E-3
Chromium, total	**8.4E+1**	1.5E-4	2.6E-4	3.7E-4	2.8E-1
Copper	**6.8E+0**	**2.9E+0**	**1.9E+0**	9.7E-1	6.0E-2
Lead	**6.3E+1**	**4.5E+0**	**3.5E+0**	**2.5E+0**	**2.4E+0**
Mercury (organic)	**2.0E+0**	**1.5E+0**	**1.5E+0**	**1.5E+0**	**8.3E+0**
Mercury (inorganic)	**2.0E+0**	6.6E-3	6.6E-3	6.6E-3	1.2E-1
Nickel	**8.4E+0**	1.1E-1	1.6E-1	2.0E-1	9.4E-3
Selenium	**5.9E+1**	**1.2E+1**	**1.8E+1**	**2.4E+1**	**3.9E+0**
Silver	**3.0E+1**	2.8E-1	1.7E-1	7.3E-2	–
Zinc	**4.5E+0**	1.7E-1	1.0E-1	3.6E-2	5.3E-1
Organic					
Acetone	–	8.9E-3	5.5E-3	2.1E-3	–
2-Amino-4,6-dinitrotoluene	5.6E-3	3.8E-2	1.2E-1	2.1E-1	–
4-Amino-2,6-dinitrotoluene	–	8.3E-2	2.7E-1	4.6E-1	–
Benzo(a)pyrene	1.3E-2	1.1E-3	4.6E-1	9.2E-1	–
Benzo(b)anthracene	1.1E-2	7.8E-4	4.2E-1	8.3E-1	–
2-Butanone	–	1.2E-6	9.4E-7	6.4E-7	–
Chloroform	–	4.0E-5	1.3E-4	2.2E-4	–
Chrysene	1.4E-2	1.3E-3	4.7E-1	9.5E-1	–
Diethyl phthalate	–	7.7E-4	5.0E-3	9.2E-3	–
m-Dinitrobenzene	–	5.7E-1	**1.1E+0**	**1.7E+0**	–
2,4-Dinitrotoluene	–	2.1E-2	7.3E-2	1.2E-1	–
Ethylbenzene	–	8.3E-8	1.3E-6	2.6E-6	–
bis(2-Ethylhexyl) phthalate	–	5.9E-5	4.3E-2	8.7E-2	**2.2E+0**
Fluoranthene	1.5E-2	2.5E-4	3.8E-2	7.6E-2	–
2-Hexanone	–	4.6E-6	8.1E-6	1.2E-5	–
HMX	–	**8.0E+0**	**6.0E+0**	**4.0E+0**	–
Methylene chloride	–	1.3E-3	1.9E-3	2.6E-3	–
n-Nitrosodiphenylamine	–	2.1E-2	4.8E-2	7.6E-2	–
Pentachlorophenol	–	5.8E-3	**1.1E+0**	**2.1E+0**	–
Pyrene	1.9E-2	3.4E-4	8.0E-2	1.6E-1	–

Refer to footnotes at end of table.

Table A-56 (Concluded)
HQs for Ecological Receptors at SWMUs 8 and 58 Combination Area
(all available analytical data)

COPEC	Plant HQ[a]	Deer Mouse HQ[a] (Herbivorous)	Deer Mouse HQ[a] (Omnivorous)	Deer Mouse HQ[a] (Insectivorous)	Burrowing Owl HQ[a]
RDX	2.0E-1	**4.9E+0**	**5.3E+0**	**5.8E+0**	–
Toluene	2.3E-5	2.6E-5	2.5E-4	4.7E-4	–
2,4,6-Trinitrotoluene	6.7E-1	**4.7E+0**	**1.0E+1**	**1.6E+1**	–
HI[b]	**2.9E+2**	**4.4E+1**	**8.0E+1**	**1.2E+2**	**3.8E+1**

[a]**Bold** values indicate the HQ or HI exceeds unity.
[b]The HI is the sum of individual HQs.
COPEC = Constituent of potential ecological concern.
HI = Hazard index.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
HQ = Hazard quotient.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
– = Insufficient toxicity data available for risk estimation purposes.

Table A-57
Total Dose Rates for Deer Mice
Exposed to Radionuclides at SWMUs 8 and 58,
Features 8Y and 58B, Debris Pile and Pit Area

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
Cs-137	**2.96**	2.3E-4
Th-232	**5.37**	1.0E-3
U-235	**2.42**	6.6E-5
U-238	**93.0**	1.5E-2
Total Dose		1.6E-2

pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Table A-58
Total Dose Rates for Burrowing Owls
Exposed to Radionuclides at SWMUs 8 and 58,
Features 8Y and 58B, Debris Pile and Pit Area

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
Cs-137	**2.96**	2.0E-4
Th-232	**5.37**	1.0E-3
U-235	**2.42**	5.0E-5
U-238	**93.0**	1.5E-2
Total Dose		1.6E-2

pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Table A-59
HQs for Ecological Receptors at SWMUs 8 and 58,
Features 8Y and 58B, Debris Pile and Pit Area

COPEC	Plant HQ[a]	Deer Mouse HQ[a] (Herbivorous)	Deer Mouse HQ[a] (Omnivorous)	Deer Mouse HQ[a] (Insectivorous)	Burrowing Owl HQ[a]
Inorganic					
Cadmium	3.9E-1	5.5E-2	5.8E-2	6.0E-2	1.9E-3
Chromium, total	**6.2E+1**	1.1E-4	1.9E-4	2.7E-4	2.1E-1
Copper	**5.4E+0**	**2.3E+0**	**1.5E+0**	7.7E-1	4.8E-2
Lead	**1.2E+0**	6.4E-2	4.9E-2	3.5E-2	3.4E-2
Mercury (Organic)	8.6E-1	6.5E-1	6.5E-1	6.5E-1	**3.7E+0**
Mercury (Inorganic)	8.6E-1	2.9E-3	2.9E-3	2.9E-3	5.2E-2
Nickel	**8.4E+0**	1.1E-1	1.6E-1	2.0E-1	9.4E-3
Silver	**3.4E+0**	3.1E-2	1.9E-2	8.1E-3	–
Zinc	**4.5E+0**	1.7E-1	1.0E-1	3.6E-2	5.3E-1
Organic					
2-amino-4,6-dinitrotoluene	5.6E-3	3.8E-2	1.2E-1	2.1E-1	–
4-amino-2,6-dinitrotoluene	–	5.8E-2	1.9E-1	3.3E-1	–
Diethylphthalate	–	7.7E-4	5.0E-3	9.2E-3	–
HMX	–	**8.0E+0**	**6.0E+0**	**4.0E+0**	–
RDX	2.7E-3	6.6E-2	7.2E-2	7.9E-2	–
2,4,6-trinitrotoluene	6.7E-1	**4.7E+0**	**1.0E+1**	**1.6E+1**	–
HI[b]	**8.7E+1**	**1.7E+1**	**2.0E+1**	**2.3E+1**	**4.6E+0**

[a]**Bold** values indicate the HQ or HI exceeds unity.
[b]The HI is the sum of individual HQs.
COPEC = Constituent of potential ecological concern.
HI = Hazard index.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
HQ = Hazard quotient.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
– = Insufficient toxicity data available for risk estimation purposes.

Table A-60
Total Dose Rates for Deer Mice
Exposed to Radionuclides at SWMUs 8 and 58,
Features 8Y and 58B, Debris Pile and Pit Area

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
U-235	**ND (0.24)**	6.5E-6
Total Dose		6.5E-6

MDA = Minimum detectable activity.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Table A-61
Total Dose Rates for Burrowing Owls
Exposed to Radionuclides at SWMUs 8 and 58,
Features 8Y and 58B, Debris Pile and Pit Area

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
U-235	**ND (0.24)**	5.0E-6
Total Dose		5.0E-6

MDA = Minimum detectable activity.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Area of Open Burning (Features 8PP/8RR)

Maximum concentrations in soil (Tables A-25 and A-33) and estimated dietary exposures are compared to plant and wildlife benchmark values, respectively. Table A-62 presents the results of these comparisons. HQs are used to quantify the comparison with benchmarks for plant and wildlife exposure. The only HQs that exceed unity are selenium for plants, and omnivorous and insectivorous deer mice. As directed by the NMED, HI values are calculated for each of the receptors (the HI is the sum of chemical-specific HQs for all pathways for a given receptor). Total HI values are greater than unity for plants and both the omnivorous and insectivorous deer mice, with a maximum HI of 4.1E+0 for plants.

Tables A-63 and A-64 summarize the internal and external dose-rate model results for Th-232 and U-235 for the deer mouse and burrowing owl, respectively. The total radiation dose rate to the deer mouse is predicted to be 2.1E-4 rad/day and that for the burrowing owl is 2.1E-4 rad/day. The dose rates for the deer mouse and the burrowing owl are lower than the benchmark of 0.1 rad/day.

Table A-62
HQs for Ecological Receptors at SWMU 8,
Features 8PP and 8RR, Area of Open Burning

COPEC	Plant HQ[a]	Deer Mouse HQ[a] (Herbivorous)	Deer Mouse HQ[a] (Omnivorous)	Deer Mouse HQ[a] (Insectivorous)	Burrowing Owl HQ[a]
Inorganic					
Selenium	**4.1E+0**	8.4E-1	**1.2E+0**	**1.6E+0**	2.1E-1
HI[b]	**4.1E+0**	8.4E-1	**1.2E+0**	**1.6E+0**	2.1E-1

[a]**Bold** values indicate the HQ or HI exceeds unity.
[b]The HI is the sum of individual HQs.
COPEC = Constituent of potential ecological concern.
HI = Hazard index.
HQ = Hazard quotient.
SWMU = Solid Waste Management Unit.

Table A-63
Total Dose Rates for Deer Mice
Exposed to Radionuclides at SWMU 8,
Features 8PP and 8RR, Area of Open Burning

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
Th-232	**1.07**	2.0E-4
U-235	**ND (0.277)**	7.5E-6
Total Dose		2.1E-4

MDA = Minimum detectable activity.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Table A-64
Total Dose Rates for Burrowing Owls
Exposed to Radionuclides at SWMU 8,
Features 8PP and 8RR, Area of Open Burning

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
Th-232	**1.07**	2.0E-4
U-235	**ND (0.277)**	5.7E-6
Total Dose		2.1E-4

MDA = Minimum detectable activity.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Pile of Fire Bricks (Feature 58FF)

Maximum concentrations in soil (Tables A-27 and A-34) and estimated dietary exposures are compared to plant and wildlife benchmark values, respectively. Table A-65 presents the results of these comparisons. HQs are used to quantify the comparison with benchmarks for plant and wildlife exposure. The HQs that exceed unity are chromium, lead, nickel, and zinc for plants, and barium for the deer mice. Because of a lack of sufficient toxicity information, the HQ for plants and the burrowing owl could not be determined for chloroform. As directed by the NMED, HI values are calculated for each of the receptors (the HI is the sum of chemical-specific HQs for all pathways for a given receptor). Total HI values are greater than unity for all of the potential receptors, with a maximum HI of 5.1E+1 for plants.

Tables A-66 and A-67 summarize the internal and external dose-rate model results for U-235 and U-238 for the deer mouse and burrowing owl, respectively. The total radiation dose rate to the deer mouse is predicted to be 2.0E-3 rad/day and that for the burrowing owl is 2.0E-3 rad/day. The dose rates for the deer mouse and the burrowing owl are lower than the benchmark of 0.1 rad/day.

Fire Brick Area No. 2 (Feature 58TT)

Maximum concentrations in soil (Tables A-29 and A-35) and estimated dietary exposures are compared to plant and wildlife benchmark values, respectively. Table A-68 presents the results of these comparisons. HQs are used to quantify the comparison with benchmarks for plant and wildlife exposure. The only HQ that exceeds unity is lead for plants. As directed by the NMED, HI values are calculated for each of the receptors (the HI is the sum of chemical-specific HQs for all pathways for a given receptor). Total HI values are greater than unity for plants, with a maximum HI of 1.6.

Tables A-69 and A-70 summarize the internal and external dose-rate model results for U-235 and U-238 for the deer mouse and burrowing owl, respectively. The total radiation dose rate to the deer mouse is predicted to be 1.5E-2 rad/day and that for the burrowing owl is 1.5E-2 rad/day. The dose rates for the deer mouse and the burrowing owl are lower than the benchmark of 0.1 rad/day.

VII.3.5 Uncertainty Assessment

Many uncertainties are associated with the characterization of ecological risks at SWMUs 8 and 58. These uncertainties result from assumptions used in calculating risk that may overestimate or underestimate true risk presented at the sites. For this risk assessment, assumptions are made that are more likely to overestimate exposures and risk rather than to underestimate them. These conservative assumptions are used to be more protective of the ecological resources potentially affected by the site. Conservatisms incorporated into this risk assessment include the use of maximum analyte concentrations measured in soil to evaluate risk, the use of wildlife toxicity benchmarks based upon NOAEL values, and the incorporation of strict herbivorous and strict insectivorous diets for predicting the extreme HQ values for the deer

Table A-65
HQs for Ecological Receptors at SWMU 58, Feature 58FF, Pile of Fire Bricks

COPEC	Plant HQ[a]	Deer Mouse HQ[a] (Herbivorous)	Deer Mouse HQ[a] (Omnivorous)	Deer Mouse HQ[a] (Insectivorous)	Burrowing Owl HQ[a]
Inorganic					
Barium	6.4E-1	8.0E-1	**2.8E+0**	**4.8E+0**	3.5E-2
Chromium, total	**4.4E+1**	7.6E-5	1.3E-4	1.9E-4	1.4E-1
Copper	3.8E-1	1.6E-1	1.1E-1	5.4E-2	3.3E-3
Lead	**2.4E+1**	1.3E-1	1.0E-1	7.0E-2	7.0E-2
Nickel	**2.0E+0**	2.7E-2	3.8E-2	4.9E-2	2.3E-3
Zinc	**1.4E+0**	5.3E-2	3.2E-2	1.1E-2	1.7E-1
Organic					
Chloroform	–	4.0E-5	1.3E-4	2.2E-4	–
HI[b]	**5.1E+1**	**1.4E+0**	**3.4E+0**	**5.4E+0**	4.9E-1

[a]**Bold** values indicate the HQ or HI exceeds unity.
[b]The HI is the sum of individual HQs.
COPEC = Constituent of potential ecological concern.
HI = Hazard index.
HQ = Hazard quotient.
SWMU = Solid Waste Management Unit.
– = Insufficient toxicity data available for risk estimation purposes.

Table A-66
Total Dose Rates for Deer Mice
Exposed to Radionuclides at SWMU 58, Feature 58TT, Fire Brick Area No. 2

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
Th-232	**5.37**	1.0E-3
U-235	**ND (0.635)**	1.7E-5
U-238	**ND (6.14**	9.9E-4
Total Dose		2.0E-3

MDA = Minimum detectable activity.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Table A-67
Total Dose Rates for Burrowing Owls
Exposed to Radionuclides at SWMU 58, Feature 58TT, Fire Brick Area No. 2

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
Th-232	**5.37**	1.0E-3
U-235	**ND (0.635)**	1.3E-5
U-238	**ND (6.14**	9.6E-4
Total Dose		2.0E-3

MDA = Minimum detectable activity.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Table A-68
HQs for Ecological Receptors at SWMU 58, Feature 58TT, Fire Brick Area No. 2

COPEC	Plant HQ[a]	Deer Mouse HQ (Herbivorous)	Deer Mouse HQ (Omnivorous)	Deer Mouse HQ (Insectivorous)	Burrowing Owl HQ
Inorganic					
Lead	**1.6E+0**	8.6E-2	6.7E-2	4.7E-2	4.6E-2
HI[b]	**1.6E+0**	8.6E-2	6.7E-2	4.7E-2	4.6E-2

[a]**Bold** values indicate the HQ or HI exceeds unity.
[b]The HI is the sum of individual HQs.
COPEC = Constituent of potential ecological concern.
HI = Hazard index.
HQ = Hazard quotient.
SWMU = Solid Waste Management Unit.

Table A-69
Total Dose Rates for Deer Mice
Exposed to Radionuclides at SWMU 58, Feature 58TT, Fire Brick Area No. 2

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
U-235	**1.49**	4.0E-5
U-238	**93.0**	1.5E-2
Total Dose		1.5E-2

pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Table A-70
Total Dose Rates for Burrowing Owls
Exposed to Radionuclides at SWMU 58, Feature 58TT, Fire Brick Area No. 2

Radionuclide	Maximum Activity (pCi/g)	Total Dose (rad/day)
U-235	**1.49**	3.1E-5
U-238	**93.0**	1.5E-2
Total Dose		1.5E-2

pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

mouse. Each of these uncertainties, which are consistent among each of the site-specific ecological risk assessments, is discussed in greater detail in the uncertainty section of the ecological risk assessment methodology document for the SNL/NM ER Project (IT July 1998).

Uncertainties associated with the estimation of risk to ecological receptors following exposure to radionuclides are primarily related to those inherent in the radionuclide-specific data. Radionuclide-dependent data are measured values that have their associated errors. The dose-rate models used for these calculations are based upon conservative estimates of receptor shape, radiation absorption by body tissues, and intake parameters. The goal is to provide a realistic but conservative estimate of a receptor's internal and external exposure to radionuclides in soil. These dose estimates are conservatively based upon detection limits of the two radionuclides, neither of which were detected at the site.

VII.3.5.1 Site-Specific Uncertainty Assessment

SWMUs 8 and 58 Combination Area (all available analytical data)

For mercury, HQs for the deer mouse and burrowing owl exceeded unity only when based upon the highly conservative assumption that all mercury at this site is in organic form. Because the exposure point concentration (0.585 mg/kg) is measured as total mercury, it is likely to represent a mixture of both organic and inorganic forms of mercury, and is probably dominated by mercury in inorganic form. When the mercury at the site is assumed to be in inorganic form, the HQs for the deer mouse and burrowing owl are less than unity, indicating no risk to these receptors.

A source of uncertainty associated with the prediction of ecological risks at this area is the use of the maximum measured concentrations to evaluate exposure and risk. This results in a conservative exposure scenario that does not necessarily reflect actual site conditions. To evaluate the potential effect on risk predictions by the use of the maximum concentrations as exposure point concentrations, the following UCLs of the mean soil concentrations (Appendix 2) were calculated:

- Arsenic (6.0 mg/kg)
- Barium (167 mg/kg)

- Cadmium (0.76 mg/kg)
- Chromium (13.0 mg/kg)
- Copper (60.2 mg/kg)
- Lead (148 mg/kg)
- Mercury (0.06 mg/kg)
- Nickel (15.2 mg/kg)
- Selenium (7.53 mg/kg)
- Silver (2.99 mg/kg)
- Zinc (51.2 mg/kg)
- m-Dinitrobenzene (0.07 mg/kg)
- bis(2-Ethylhexyl) phthalate (0.15 mg/kg)
- HMX (0.88 mg/kg)
- Pentachlorophenol (0.12 mg/kg)
- RDX (2.79 mg/kg)
- 2,4,6-Trinitrotoluene (1.68 mg/kg)

The UCLs for arsenic, barium, chromium, nickel and zinc are less than their background screening levels, indicating that average COPEC exposures at this site are within background levels and can be eliminated for the risk calculation. With the exception of lead, selenium, silver, 2,4,6-trinitrotoluene, and HMX, all the HQs for all the potential receptors are reduced to levels below unity based upon the UCLs of the mean soil concentrations. Of the five exceptions, all the HQs were reduced to values less than or equal to 7.5, indicating low average risk to these receptors from these COPECs. Further, in all of these cases, the UCL is a conservative estimate of the actual mean concentration. A 95-percent likelihood exists that the actual site mean is less than the UCL concentration. Therefore, the average exposure and risk are likely to be less than that estimated from the UCL.

In the cases of HMX and 2,4,6-trinitrotoluene, the HQs exceeding unity based upon the UCLs are limited to the herbivorous and insectivorous deer mice, respectively. In both cases, these HQs are only slightly greater than unity (1.3 and 1.4, respectively). Because both of these deer mouse receptors represent the extremes in diet, it is likely that the HQs overestimate actual exposures to small mammals at this site. For both of these COPECs, the HQ for the omnivorous deer mouse is less than unity. Therefore, the potential for risk associated with these two COPECs is low.

In the cases of lead and silver, the HQs exceeding unity based upon the UCLs are limited to plants (3.0 and 1.5, respectively). Uncertainty associated with these HQs relates to the selected plant toxicity benchmarks and the assumed bioavailability of these metals in the soil. The plant toxicity benchmark for lead (50 mg/kg) is based upon the tenth percentile of the lowest-observed-effect-concentration (LOEC) values based upon 17 published LOEC values (as determined by Efroymson et al. 1997). The three lowest of these, which range from 50 to 100 mg/kg, are based upon trees (sycamore, red oak, and spruce), and therefore are not appropriate test species for this grassland site. The lowest LOEC for a grass species (corn) is 250 mg/kg, which is five times higher than the conservatively selected plant benchmark used in this risk assessment. The lowest LOEC for a native grass species (bluestem) is 450 mg/kg, which is nine times higher than the selected benchmark. The use of either of these LOECs as the plant toxicity benchmark would reduce the HQ for lead in plants to less than unity. Also, it should be noted that these LOEC values are all based upon lead in the highly available form of

lead chloride ($PbCl_2$). It is unlikely that the lead in the soil at this site will be in a similarly available form. The lowest LOEC for lead oxide (PbO) is 1,000 mg/kg, based upon wheat (Efroymson et al. 1997), which is 20 times higher than the selected benchmark, and probably better reflects the form of lead in the soil at this site. The plant toxicity benchmark for silver (2 mg/kg) is based upon a single published plant benchmark with no specified effects (Efroymson et al. 1997). Therefore, the prediction of risk to plants from exposure to silver, although low, is associated with a high degree of uncertainty.

For selenium, the HQs exceeding unity based upon the UCLs were for plants (7.5) and the herbivorous, omnivorous, and insectivorous deer mice (1.6, 2.3, and 3.1, respectively). As with lead, the plant toxicity benchmark for selenium is based upon a highly available form of that metal (sodium selenate), which probably overestimates the bioavailability of selenium at the sites. In the case of the deer mice, it should again be noted that the herbivorous and insectivorous dietary regimes represent the extreme cases in potential exposure, and that average exposures in small mammals are better represented by the omnivorous diet. These exposure estimates are based in part on the estimated uptake of selenium into plants and soil invertebrates. For plants, the uptake value of 0.5 was used (Table A-53), which is conservatively selected as the maximum between two literature-based uptake values for selenium. The other value is 0.025 from Baes et al. (1984), which is 20 times less than the uptake value used to estimate exposure. For uptake into soil invertebrates, no values were found in the literature; therefore, the conservative default uptake factor of 1.0 was used. Thus, the uptake of selenium into both plants and soil invertebrates are both conservatively estimated in this assessment and associated with a high degree of uncertainty. It is therefore likely that the estimates of risk to deer mice from exposure to selenium are overestimates of actual risk. It should also be noted that selenium concentrations are less than background at the Debris Pile and Pit area and the Pile of Fire Bricks, and selenium was not detected at the Area of Open Burning nor the Fire Brick Area No. 2. The UCL of selenium is strongly influenced by the single high reported value of 59 mg/kg and may not represent the levels of selenium at SWMUs 8 and 58 as a whole.

Based upon this uncertainty analysis, the potential for ecological risks at the SWMUs 8 and 58 Combination area based upon all available analytical data is expected to be low. HQs greater than unity were predicted; however, closer examination of the exposure assumptions reveal an overestimation of risk primarily attributed to conservative toxicity benchmarks; the use of maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

Debris Pile and Pit Area (Features 8Y/58B)

For the burrowing owl, HQs for mercury exceeded unity only when based upon the highly conservative assumption that all mercury at this site is in organic form. Because the exposure point concentration (0.258 mg/kg) is measured as total mercury, it is likely to represent a mixture of both organic and inorganic forms of mercury, and is probably dominated by mercury in inorganic form. When the mercury at the site is assumed to be in inorganic form, the HQ for the burrowing owl is 0.052, indicating no risk to this receptor.

A further source of uncertainty associated with the prediction of ecological risks at this area is the use of the maximum measured concentrations to evaluate exposure and risk. This results in a conservative exposure scenario that does not necessarily reflect actual site conditions. To

evaluate the potential effect on risk predictions by the use of the maximum concentrations as exposure point concentrations, UCLs of the mean soil concentrations (Appendix 2) were calculated for chromium (26.3 mg/kg), copper (270 mg/kg), lead (26.2 mg/kg), nickel (76.3 mg/kg), silver (2.69 mg/kg), zinc (100.7 mg/kg), HMX (2.54 mg/kg), and 2,4,6-trinitrotoluene (5.36 mg/kg). Exposures to plants at the UCL concentrations for COPECs reduce the HQs to less than 26 (26 for chromium), indicating low average risk to this receptor from these COPECs. In addition, all of the HQs for plants, except chromium, were less than 3.0. All of the deer mouse HQs are reduced to levels below 5, indicating low average risk to this receptor from these COPECs.

The high HQ for chromium in plants is likely due to the fact that the plant toxicity benchmark for this metal (1.0 mg/kg, from Efroymson et al. 1997) is based upon toxicity tests that used chromium VI, which is probably more toxic to plants than the more common chromium III. It should be noted that the background screening value for chromium (18.9 mg/kg) is significantly higher than the plant toxicity benchmark, indicating that this benchmark overestimates risk to plants. The plant HQs for copper, nickel, and zinc (2.7, 2.5, and 2.0, respectively, based upon the UCLs) are also likely to overestimate actual risk because the plant toxicity benchmarks for these COPECs are all based upon the sulfate salt of the respective metal (Efroymson et al. 1997). This form is likely to be more bioavailable to plants than the forms of these metal likely to occur at the site. Finally, as discussed for the SWMUs 8 and 58 Combination data set, the plant toxicity benchmark for silver (2 mg/kg) is based upon a single published plant benchmark with no specified effects (Efroymson et al. 1997). Therefore, the prediction of risk to plants from exposure to silver, although low (1.3), is associated with a high degree of uncertainty.

Also as previously discussed, the risk to the small mammals that are likely to occur at the site is best represented by the predicted risk to the omnivorous deer mouse rather than the deer mice modeled with either of the two extreme diets (purely herbivorous and purely insectivorous). Based upon the UCL concentrations, the only HQs exceeding unity for the omnivorous deer mouse are those for 2,4,6-trinitrotoluene (2.8) and HMX (2.7). In both cases, these HQs indicate low potential for risk to small mammal receptors.

Based upon this uncertainty analysis, the potential for ecological risks at the Debris Pile and Pit area is expected to be low. HQs greater than unity were predicted; however, closer examination of the exposure assumptions reveal an overestimation of risk primarily attributed to conservative toxicity benchmarks; the use of maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

Area of Open Burning (Features 8PP/8RR)

Although the HQs for selenium exceed unity for plants and omnivorous and insectivorous deer mice (4.1, 1.2, and 1.6, respectively), it should be noted that selenium was not detected. For this reason, the exposure point concentration for selenium is based upon one-half of the detection limit for this analyte. Therefore, although the potential for risk to these two receptors from exposure to selenium cannot be ruled out, the conservative estimates of that risk based upon this exposure point concentration are low. It is considered unlikely that actual concentrations of selenium at this site are sufficient to pose a risk to ecological receptors.

Based upon this uncertainty analysis, the potential for ecological risks at the Area of Open Burning is expected to be very low. HQs greater than unity were predicted; however, closer

examination of the exposure assumptions revealed an overestimation of risk primarily attributed to conservative toxicity benchmarks; the maximum concentrations was a nondetect, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

Pile of Fire Bricks (Feature 58FF)

A source of uncertainty associated with the prediction of ecological risks at this area is the use of the maximum measured concentrations to evaluate exposure and risk. This results in a conservative exposure scenario that does not necessarily reflect actual site conditions. To evaluate the potential effect on risk predictions by the use of the maximum concentrations as exposure point concentrations, UCLs of the mean soil concentrations (Appendix 2) were calculated for chromium (19.3 mg/kg), barium (175 mg/kg), lead (40.8 mg/kg), nickel (21.1 mg/kg), and zinc (48.6 mg/kg). The UCL for barium, chromium, and zinc are less than their background screening levels, indicating that average COPEC exposures at this site are within background levels and can be eliminated for the risk calculation. All the HQs for all the potential receptors are reduced to levels below unity based upon the UCL of the mean soil concentrations.

Based upon this uncertainty analysis, the potential for ecological risks at the Pile of Fire Bricks is expected to be low. HQs greater than unity were predicted; however, closer examination of the exposure assumptions reveal an overestimation of risk primarily attributed to conservative toxicity benchmarks; the use of maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

Fire Brick Area No. 2 (Feature 58TT)

For Fire Brick Area No. 2, lead is the only COPEC that slightly exceeds unity (1.6). Based upon this uncertainty analysis, the potential for ecological risks at Fire Brick Area No. 2 is expected to be very low. HQs greater than unity were predicted; however, closer examination of the exposure assumptions reveal an overestimation of risk primarily attributed to conservative toxicity benchmarks; use of the maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure; and the contribution of background risk.

VII.3.6 Risk Interpretation

Ecological risks associated with SWMUs 8 and 58 are estimated through a risk assessment that incorporates site-specific information when available. Initial calculations of HQs indicated a potential for risk for 11 inorganic and 6 organic COPECs. However, based upon the analysis of uncertainties associated with these HQs, the actual potential for risk to ecological receptors is expected to be low. This is primarily due to the use of maximum detected values as the exposure point concentrations for these HQs. Predicted risks from exposures based upon the UCL concentrations are significantly lower. For arsenic, barium, chromium, nickel, and zinc, the UCL concentrations for the SWMUs 8 and 58 Combination data set were found to be within the background ranges for these COPECs. This was also found to be the case for the UCLs for barium, chromium, and zinc at the Pile of Fire Bricks area. All HQs based upon the UCLs were less than or equal to 7.5 and/or were attributable to conservative toxicity benchmarks, to

conservative assumptions of bioavailability, or (in the case of the deer mouse) to extreme assumptions of diet (i.e., pure herbivory or pure insectivory).

Therefore, the analysis of the uncertainties associated with the predicted HQ values indicate that they are more likely to overestimate actual risk rather than underestimate it. Based upon this final analysis, the potential for ecological risks associated with SWMUs 8 and 58 is expected to be low.

VII.3.7 Risk Assessment Scientific/Management Decision Point

After potential ecological risks associated with the site have been assessed, a decision is made regarding whether the site should be recommended for CAC without controls or whether additional data should be collected to more thoroughly assess actual ecological risk at the site. With respect to the five SWMU 8 and 58 areas evaluated, ecological risks are predicted to be low. The scientific/management decision is to recommend this site for CAC without controls.

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APPENDIX 1
EXPOSURE PATHWAY DISCUSSION FOR CHEMICAL AND RADIONUCLIDE CONTAMINATION

Introduction

Sandia National Laboratories/New Mexico (SNL/NM) uses a default set of exposure routes and associated default parameter values developed for each future land-use designation being considered for SNL/NM Environmental Restoration (ER) Project sites. This default set of exposure scenarios and parameter values are invoked for risk assessments unless site-specific information suggests other parameter values. Because many SNL/NM solid waste management units (SWMUs) have similar types of contamination and physical settings, SNL/NM believes that the risk assessment analyses at these sites can be similar. A default set of exposure scenarios and parameter values facilitates the risk assessments and subsequent review.

The default exposure routes and parameter values used are those that SNL/NM views as resulting in a Reasonable Maximum Exposure (RME) value. Subject to comments and recommendations by the U.S. Environmental Protection Agency (EPA) Region VI and New Mexico Environment Department (NMED), SNL/NM will use these default exposure routes and parameter values in future risk assessments.

At SNL/NM, all SWMUs exist within the boundaries of the Kirtland Air Force Base. Approximately 240 potential waste and release sites have been identified where hazardous, radiological, or mixed materials may have been released to the environment. Evaluation and characterization activities have occurred at all of these sites to varying degrees. Among other documents, the SNL/NM ER draft Environmental Assessment (DOE 1996) presents a summary of the hydrogeology of the sites and the biological resources present. When evaluating potential human health risk the current or reasonably foreseeable land use negotiated and approved for the specific SWMU/AOC, aggregate, or watershed will be used. The following references generally document these land uses: *Workbook: Future Use Management Area 2 (DOE et al. September 1995); Workbook: Future Use Management Area 1 (DOE et al. October 1995); Workbook: Future Use Management Areas 3, 4, 5, and 6 (DOE and USAF January 1996); Workbook: Future Use Management Area 7 (DOE and USAF March 1996)*. At this time, all SNL/NM SWMUs have been tentatively designated for either industrial or recreational future land use. The NMED has also requested that risk calculations be performed based upon a residential land-use scenario. Therefore, all three land-use scenarios will be addressed in this document.

The SNL/NM ER Project has screened the potential exposure routes and identified default parameter values to be used for calculating potential intake and subsequent hazard index (HI), excess cancer risk and dose values. The EPA (EPA 1989) provides a summary of exposure routes that could potentially be of significance at a specific waste site. These potential exposure routes consist of:

- Ingestion of contaminated drinking water
- Ingestion of contaminated soil

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water
- Dermal contact with chemicals in soil
- Inhalation of airborne compounds (vapor phase or particulate)
- External exposure to penetrating radiation (immersion in contaminated air; immersion in contaminated water; and exposure from ground surfaces with photon-emitting radionuclides)

Based upon the location of the SNL/NM SWMUs and the characteristics of the surface and subsurface at the sites, we have evaluated these potential exposure routes for different land-use scenarios to determine which should be considered in risk assessment analyses (the last exposure route is pertinent to radionuclides only). At SNL/NM SWMUs, there is currently no consumption of fish, shellfish, fruits, vegetables, meat, eggs, or dairy products that originate on site. Additionally, no potential for swimming in surface water is present due to the high-desert environmental conditions. As documented in the RESRAD computer code manual (ANL 1993), risks resulting from immersion in contaminated air or water are not significant compared to risks from other radiation exposure routes.

For the industrial and recreational land-use scenarios, SNL/NM ER has, therefore, excluded the following five potential exposure routes from further risk assessment evaluations at any SNL/NM SWMU:

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water

That part of the exposure pathway for radionuclides related to immersion in contaminated air or water is also eliminated.

Based upon this evaluation, for future risk assessments the exposure routes that will be considered are shown in Table 1.

Table 1
Exposure Pathways Considered for Various Land-Use Scenarios

Industrial	Recreational	Residential
Ingestion of contaminated drinking water	Ingestion of contaminated drinking water	Ingestion of contaminated drinking water
Ingestion of contaminated soil	Ingestion of contaminated soil	Ingestion of contaminated soil
Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)
Dermal contact (nonradiological constituents only) soil only	Dermal contact (nonradiological constituents only) soil only	Dermal contact (nonradiological constituents only) soil only
External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces

Equations and Default Parameter Values for Identified Exposure Routes

In general, SNL/NM expects that ingestion of compounds in drinking water and soil will be the more significant exposure routes for chemicals; external exposure to radiation may also be significant for radionuclides. All of the above routes will, however, be considered for their appropriate land-use scenarios. The general equation for calculating potential intakes via these routes is shown below. The equations are taken from "Assessing Human Health Risks Posed by Chemicals: Screening-Level Risk Assessment" (NMED March 2000) and "Technical Background Document for Development of Soil Screening Levels" (NMED February 2004). Equations from both documents are based upon the "Risk Assessment Guidance for Superfund" (RAGS): Volume 1 (EPA 1989, 1991). These general equations also apply to calculating potential intakes for radionuclides. A more in-depth discussion of the equations used in performing radiological pathway analyses with the RESRAD code may be found in the RESRAD Manual (ANL 1993). RESRAD is the only code designated by the U.S. Department of Energy (DOE) in DOE Order 5400.5 for the evaluation of radioactively contaminated sites (DOE 1993). The Nuclear Regulatory Commission (NRC) has approved the use of RESRAD for dose evaluation by licensees involved in decommissioning, NRC staff evaluation of waste disposal requests, and dose evaluation of sites being reviewed by NRC staff. EPA Science Advisory Board reviewed the RESRAD model. EPA used RESRAD in their rulemaking on radiation site cleanup regulations. RESRAD code has been verified, undergone several benchmarking analyses, and been included in the International Atomic Energy Agency's VAMP and BIOMOVS II projects to compare environmental transport models.

Also shown are the default values SNL/NM ER will use in RME risk assessment calculations for industrial, recreational, and residential land-use scenarios, based upon EPA and other governmental agency guidance. The pathways and values for chemical contaminants are discussed first, followed by those for radionuclide contaminants. RESRAD input parameters that are left as the default values provided with the code are not discussed. Further information relating to these parameters may be found in the RESRAD Manual (ANL 1993) or by directly accessing the RESRAD websites at: http://web.ead.anl.gov/resrad/home2/ or http://web.ead.anl.gov/resrad/documents/.

Generic Equation for Calculation of Risk Parameter Values

The equation used to calculate the risk parameter values (i.e., hazard quotients/HI, excess cancer risk, or radiation total effective dose equivalent [TEDE] [dose]) is similar for all exposure pathways and is given by:

Risk (or Dose) = Intake x Toxicity Effect (either carcinogenic, noncarcinogenic, or radiological)

$$= C \times (CR \times EFD/BW/AT) \times \text{Toxicity Effect} \quad (1)$$

where;

C = contaminant concentration (site specific)
CR = contact rate for the exposure pathway
EFD= exposure frequency and duration
BW = body weight of average exposure individual
AT = time over which exposure is averaged.

For nonradiological constituents of concern (COCs), the total risk/dose (either cancer risk or HI) is the sum of the risks/doses for all of the site-specific exposure pathways and contaminants. For radionuclides, the calculated radiation exposure, expressed as TEDE is compared directly to the exposure guidelines of 15 millirem per year (mrem/year) for industrial and recreational future use and 75 mrem/year for the unlikely event that institutional control of the site is lost and the site is used for residential purposes (EPA 1997).

The evaluation of the carcinogenic health hazard produces a quantitative estimate for excess cancer risk resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of the quantitative estimate with the potentially acceptable risk of 1E-5 for nonradiological carcinogens. The evaluation of the noncarcinogenic health hazard produces a quantitative estimate (i.e., the HI) for the toxicity resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of this quantitative estimate with the EPA standard HI of unity (1). The evaluation of the health hazard from radioactive compounds produces a quantitative estimate of doses resulting from the COCs present at the site. This estimated dose is used to calculate an assumed risk. However, this calculated risk is presented for illustration purposes only, not to determine compliance with regulations.

The specific equations used for the individual exposure pathways can be found in RAGS (EPA 1989) and are outlined below. The RESRAD Manual (ANL 1993) describes similar equations for the calculation of radiological exposures.

Soil Ingestion

A receptor can ingest soil or dust directly by working in the contaminated soil. Indirect ingestion can occur from sources such as unwashed hands introducing contaminated soil to food that is then eaten. An estimate of intake from ingesting soil will be calculated as follows:

$$I_s = \frac{C_s * IR * CF * EF * ED}{BW * AT}$$

where:

I_s = Intake of contaminant from soil ingestion (milligrams [mg]/kilogram [kg]-day)
C_s = Chemical concentration in soil (mg/kg)
IR = Ingestion rate (mg soil/day)
CF = Conversion factor (1E-6 kg/mg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
BW = Body weight (kg)
AT = Averaging time (period over which exposure is averaged) (days)

It should be noted that it is conservatively assumed that the receptor only ingests soil from the contaminated source.

Soil Inhalation

A receptor can inhale soil or dust directly by working in the contaminated soil. An estimate of intake from inhaling soil will be calculated as follows (EPA August 1997):

$$I_s = \frac{C_s * IR * EF * ED * \left(1/VF \text{ or } 1/PEF\right)}{BW * AT}$$

where:

I_s = Intake of contaminant from soil inhalation (mg/kg-day)
C_s = Chemical concentration in soil (mg/kg)
IR = Inhalation rate (cubic meters [m^3]/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
VF = soil-to-air volatilization factor (m^3/kg)
PEF = particulate emission factor (m^3/kg)
BW = Body weight (kg)
AT = Averaging time (period over which exposure is averaged) (days)

Soil Dermal Contact

$$D_a = \frac{C_s * CF * SA * AF * ABS * EF * ED}{BW * AT}$$

where:

D_a = Absorbed dose (mg/kg-day)
C_s = Chemical concentration in soil (mg/kg)
CF = Conversion factor (1E-6 kg/mg)
SA = Skin surface area available for contact (cm^2/event)
AF = Soil to skin adherence factor (mg/cm^2)
ABS = Absorption factor (unitless)
EF = Exposure frequency (events/year)

ED = Exposure duration (years)
BW = Body weight (kg)
AT = Averaging time (period over which exposure is averaged) (days)

Groundwater Ingestion

A receptor can ingest water by drinking it or through using household water for cooking. An estimate of intake from ingesting water will be calculated as follows (EPA August 1997):

$$I_w = \frac{C_w * IR * EF * ED}{BW * AT}$$

where:

I_w = Intake of contaminant from water ingestion (mg/kg/day)
C_w = Chemical concentration in water (mg/liter [L])
IR = Ingestion rate (L/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
BW = Body weight (kg)
AT = Averaging time (period over which exposure is averaged) (days)

Groundwater Inhalation

The amount of a constituent taken into the body via exposure to volatilization from showering or other household water uses will be evaluated using the concentration of the constituent in the water source (EPA 1991 and 1992). An estimate of intake from volatile inhalation from groundwater will be calculated as follows (EPA 1991):

$$I_w = \frac{C_w * K * IR_i * EF * ED}{BW * AT}$$

where:

I_w = Intake of volatile in water from inhalation (mg/kg/day)
C_w = Chemical concentration in water (mg/L)
K = volatilization factor (0.5 L/m^3)
IR_i = Inhalation rate (m^3/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
BW = Body weight (kg)
AT = Averaging time (period over which exposure is averaged—days)

For volatile compounds, volatilization from groundwater can be an important exposure pathway from showering and other household uses of groundwater. This exposure pathway will only be evaluated for organic chemicals with a Henry's Law constant greater than $1x10^{-5}$ and with a molecular weight of 200 grams/mole or less (EPA 1991).

Tables 2 and 3 show the default parameter values suggested for use by SNL/NM at SWMUs, based upon the selected land-use scenarios for nonradiological and radiological COCs,

respectively. References are given at the end of the table indicating the source for the chosen parameter values. SNL/NM uses default values that are consistent with both regulatory guidance and the RME approach. Therefore, the values chosen will, in general, provide a conservative estimate of the actual risk parameter. These parameter values are suggested for use for the various exposure pathways, based upon the assumption that a particular site has no unusual characteristics that contradict the default assumptions. For sites for which the assumptions are not valid, the parameter values will be modified and documented.

Summary

SNL/NM will use the described default exposure routes and parameter values in risk assessments at sites that have an industrial, recreational, or residential future land-use scenario. There are no current residential land-use designations at SNL/NM ER sites, but NMED has requested this scenario to be considered to provide perspective of the risk under the more restrictive land-use scenario. For sites designated as industrial or recreational land use, SNL/NM will provide risk parameter values based upon a residential land-use scenario to indicate the effects of data uncertainty on risk value calculations or in order to potentially mitigate the need for institutional controls or restrictions on SNL/NM ER sites. The parameter values are based upon EPA guidance and supplemented by information from other government sources. If these exposure routes and parameters are acceptable, SNL/NM will use them in risk assessments for all sites where the assumptions are consistent with site-specific conditions. All deviations will be documented.

Table 2
Default Nonradiological Exposure Parameter Values for Various Land-Use Scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure Frequency (day/yr)	250[a,b]	8.7 (4 hr/wk for 52 wk/yr)[a,b]	350[a,b]
Exposure Duration (yr)	25[a,b,c]	30[a,b,c]	30[a,b,c]
Body Weight (kg)	70[a,b,c]	70 Adult[a,b,c] 15 Child[a,b,c]	70 Adult[a,b,c] 15 Child[a,b,c]
Averaging Time (days) for Carcinogenic Compounds (= 70 yr x 365 day/yr) for Noncarcinogenic Compounds (= ED x 365 day/yr)	25,550[a,b] 9,125 [a,b]	25,550[a,b] 10,950[a,b]	25,550 [a,b] 10,950 [a,b]
Soil Ingestion Pathway			
Ingestion Rate (mg/day)	100[a,b]	200 Child[a,b] 100 Adult[a,b]	200 Child [a,b] 100 Adult [a,b]
Inhalation Pathway			
Inhalation Rate (m^3/day)	20[a,b]	15 Child[a] 30 Adult[a]	10 Child[a] 20 Adult[a]
Volatilization Factor (m^3/kg)	Chemical Specific	Chemical Specific	Chemical Specific
Particulate Emission Factor (m^3/kg)	1.36E9[a]	1.36E9[a]	1.36E9[a]
Water Ingestion Pathway			
Ingestion Rate (liter/day)	2.4[a]	2.4[a]	2.4[a]
Dermal Pathway			
Skin Adherence Factor (mg/cm^2)	0.2[a]	0.2 Child[a] 0.07 Adult[a]	0.2 Child[a] 0.07 Adult[a]
Exposed Surface Area for Soil/Dust (cm^2/day)	3,300[a]	2,800 Child[a] 5,700 Adult[a]	2,800 Child[a] 5,700 Adult[a]
Skin Adsorption Factor	Chemical Specific	Chemical Specific	Chemical Specific

[a]Technical Background Document for Development of Soil Screening Levels (NMED 2000).
[b]Risk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).
[c]Exposure Factors Handbook (EPA August 1997).
ED = Exposure duration.
EPA = U.S. Environmental Protection Agency.
hr = Hour(s).
kg = Kilogram(s).
m = Meter(s).
mg = Milligram(s).
NA = Not available.
wk = Week(s).
yr = Year(s).

Table 3
Default Radiological Exposure Parameter Values for Various Land-Use Scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure Frequency	8 hr/day for 250 day/yr	4 hr/wk for 52 wk/yr	365 day/yr
Exposure Duration (yr)	25[a,b]	30[a,b]	30[a,b]
Body Weight (kg)	70 Adult[a,b]	70 Adult[a,b]	70 Adult[a,b]
Soil Ingestion Pathway			
Ingestion Rate	100 mg/day[c]	100 mg/day[c]	100 mg/day[c]
Averaging Time (days) (= 30 yr x 365 day/yr)	10,950[d]	10,950[d]	10,950[d]
Inhalation Pathway			
Inhalation Rate (m^3/yr)	7,300[d,e]	10,950[e]	7,300[d,e]
Mass Loading for Inhalation g/m^3	1.36 E-5[d]	1.36 E-5 [d]	1.36 E-5 [d]
Food Ingestion Pathway			
Ingestion Rate, Leafy Vegetables (kg/yr)	NA	NA	16.5[c]
Ingestion Rate, Fruits, Non-Leafy Vegetables & Grain (kg/yr)	NA	NA	101.8[b]
Fraction Ingested	NA	NA	0.25[b,d]

[a]Risk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).
[b]Exposure Factors Handbook (EPA August 1997).
[c]EPA Region VI guidance (EPA 1996).
[d]For radionuclides, RESRAD (ANL 1993).
[e]SNL/NM (February 1998).
EPA = U.S. Environmental Protection Agency.
g = Gram(s)
hr = Hour(s).
kg = Kilogram(s).
m = Meter(s).
mg = Milligram(s).
NA = Not applicable.
wk = Week(s).
yr = Year(s).

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APPENDIX 2
CALCULATION OF THE UPPER CONFIDENCE LIMITS OF MEAN CONCENTRATIONS

For conservatism, Sandia National Laboratories/New Mexico uses the maximum concentration of the constituents of concern (COCs) for initial risk calculation. If the maximum concentrations produce risk above New Mexico Environment Department (NMED) guidelines, conservatism with this approach is evaluated and, if appropriate, a more realistic approach is applied. When the site has been adequately characterized, an estimate of the mean concentration of the COCs is more representative of actual site conditions. The NMED has proposed the use of the 95, 97.5, or 99% upper confidence limit (UCL) of the mean (depending upon the variants of the data set) to represent average concentrations at a site (NMED February 2004). The UCL is calculated according to NMED guidance (Tharp June 2002) using the U.S. Environmental Protection Agency ProUCL program (EPA April 2002). Attached are the outputs from that program and the calculated UCLs used in the risk analysis.

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ATTACHMENT

Combined Data - Human Health		
Summary Statistics for	Arsenic	
Number of Samples	330	
Minimum	0.01	
Maximum	137	
Mean	6.72	
Median	3.23	
Standard Deviation	13.30	
Variance	176.96	
Coefficient of Variation	1.98	
Skewness	6.71	
Lilliefors Test Statisitic	0.14	
Lilliefors 5% Critical Value	0.05	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	7.93	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	8.21	
Modified-t	7.97	
95 % Non-parametric UCL		
CLT	7.92	
Jackknife	7.93	
Standard Bootstrap	7.96	
Bootstrap-t	8.57	
Chebyshev (Mean, Std)	9.91	

Combined Data - Human Health		
Summary Statistics for	Barium	
Number of Samples	330	
Minimum	1.53	
Maximum	988	
Mean	128.59	
Median	110	
Standard Deviation	102.42	
Variance	10489	
Coefficient of Variation	0.80	
Skewness	3.03	
Lilliefors Test Statisitic	0.10	
Lilliefors 5% Critical Value	0.05	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	137.89	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	138.87	
Modified-t	138.04	
95 % Non-parametric UCL		
CLT	137.86	
Jackknife	137.89	
Standard Bootstrap	137.83	
Bootstrap-t	138.88	
Chebyshev (Mean, Std)	153.16	

Combined Data - Human Health		
Summary Statistics for	Beryllium	
Number of Samples	330	
Minimum	0.055	
Maximum	79.30	
Mean	1.08	
Median	0.41	
Standard Deviation	5.74	
Variance	32.93	
Coefficient of Variation	5.34	
Skewness	11.09	
Lilliefors Test Statisitic	0.15	
Lilliefors 5% Critical Value	0.05	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	1.60	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.80	
Modified-t	1.63	
95 % Non-parametric UCL		
CLT	1.60	
Jackknife	1.60	
Standard Bootstrap	1.60	
Bootstrap-t	2.59	
Chebyshev (Mean, Std)	2.45	

Combined Data - Human Health		
Summary Statistics for	Cadmium	
Number of Samples	330	
Minimum	0.0025	
Maximum	6.020	
Mean	0.431	
Median	0.172	
Standard Deviation	0.765	
Variance	0.585	
Coefficient of Variation	1.774	
Skewness	4.987	
Lilliefors Test Statisitic	0.137	
Lilliefors 5% Critical Value	0.049	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.501	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	0.513	
Modified-t	0.503	
95 % Non-parametric UCL		
CLT	0.500	
Jackknife	0.501	
Standard Bootstrap	0.499	
Bootstrap-t	0.517	
Chebyshev (Mean, Std)	0.615	

Combined Data - Human Health		
Summary Statistics for	Copper	
Number of Samples	240	
Minimum	1.64	
Maximum	684	
Mean	30.03	
Median	14.60	
Standard Deviation	75.18	
Variance	5652	
Coefficient of Variation	2.50	
Skewness	6.28	
Lilliefors Test Statisitic	0.16	
Lilliefors 5% Critical Value	0.06	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	38.04	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	40.12	
Modified-t	38.37	
95 % Non-parametric UCL		
CLT	38.01	
Jackknife	38.04	
Standard Bootstrap	38.12	
Bootstrap-t	42.10	
Chebyshev (Mean, Std)	51.18	

Combined Data - Human Health		
Summary Statistics for	Lead	
Number of Samples	330	
Minimum	0.0752	
Maximum	15000	
Mean	100.74	
Median	8.07	
Standard Deviation	941.02	
Variance	885517.46	
Coefficient of Variation	9.34	
Skewness	13.40	
Lilliefors Test Statisitic	0.1431634	
Lilliefors 5% Critical Value	0.0487727	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	186.18	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	226.76	
Modified-t	192.55	
95 % Non-parametric UCL		
CLT	185.94	
Jackknife	186.18	
Standard Bootstrap	185.60	
Bootstrap-t	409.63	
Chebyshev (Mean, Std)	326.54	

Combined Data - Human Health		
Summary Statistics for	Nickel	
Number of Samples	330	
Minimum	1.87	
Maximum	3960	
Mean	29.09	
Median	9.38	
Standard Deviation	226.59	
Variance	51340.85	
Coefficient of Variation	7.79	
Skewness	16.19	
Lilliefors Test Statisitic	0.16	
Lilliefors 5% Critical Value	0.05	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	49.67	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	61.49	
Modified-t	51.52	
95 % Non-parametric UCL		
CLT	49.61	
Jackknife	49.67	
Standard Bootstrap	49.52	
Bootstrap-t	116.06	
Chebyshev (Mean, Std)	83.46	

Combined Data - Human Health		
Summary Statistics for	Selenium	
Number of Samples	330	
Minimum	0.035	
Maximum	79	
Mean	4.207	
Median	0.359	
Standard Deviation	10.176	
Variance	103.549	
Coefficient of Variation	2.419	
Skewness	3.170	
Lilliefors Test Statisitic	0.149	
Lilliefors 5% Critical Value	0.049	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	5.131	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	5.233	
Modified-t	5.147	
95 % Non-parametric UCL		
CLT	5.128	
Jackknife	5.131	
Standard Bootstrap	5.157	
Bootstrap-t	5.312	
Chebyshev (Mean, Std)	6.649	

Combined Data - Human Health		
Summary Statistics for	Silver	
Number of Samples	266	
Minimum	0.0106	
Maximum	60.50	
Mean	1.11	
Median	0.12	
Standard Deviation	6.11	
Variance	37.34	
Coefficient of Variation	5.53	
Skewness	8.49	
Lilliefors Test Statisitic	0.09	
Lilliefors 5% Critical Value	0.05	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	1.72	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.93	
Modified-t	1.76	
95 % Non-parametric UCL		
CLT	1.72	
Jackknife	1.72	
Standard Bootstrap	1.73	
Bootstrap-t	2.46	
Chebyshev (Mean, Std)	2.74	

Combined Data - Human Health				
Summary Statistics for			benzo(a)pyrene	
Number of Samples			21	
Minimum			0.081	
Maximum			0.235	
Mean			0.09	
Median			0.08	
Standard Deviation			0.03	
Variance			0.00	
Coefficient of Variation			0.37	
Skewness			4.58	
Shapiro-Wilk Test Statisitic			0.254313358	
Shapiro-Wilk 5% Critical Value			0.908	
Data not Lognormal at 5% Significance Level				
Data not Normal: Try Non-parametric UCL				
95	% UCL (Assuming Normal Data)			
Student's-t			0.10	
95	% UCL (Adjusted for Skewness)			
Adjusted-CLT			0.11	
Modified-t			0.10	
95	% Non-parametric UCL			
CLT			0.10	
Jackknife			0.10	
Standard Bootstrap			0.10	
Bootstrap-t			0.56	
Chebyshev (Mean, Std)			0.12	

Combined Data - Human Health				
Summary Statistics for			RDX	
Number of Samples			41	
Minimum			0.0001	
Maximum			19.9	
Mean			0.55	
Median			0.12	
Standard Deviation			3.10	
Variance			9.59	
Coefficient of Variation			5.58	
Skewness			6.40	
Shapiro-Wilk Test Statisitic			0.799237866	
Shapiro-Wilk 5% Critical Value			0.941	
Data not Lognormal at 5% Significance Level				
Data not Normal: Try Non-parametric UCL				
95	% UCL (Assuming Normal Data)			
Student's-t			1.37	
95	% UCL (Adjusted for Skewness)			
Adjusted-CLT			1.87	
Modified-t			1.45	
95	% Non-parametric UCL			
CLT			1.35	
Jackknife			1.37	
Standard Bootstrap			1.36	
Bootstrap-t			26.31	
Chebyshev (Mean, Std)			2.66	

Combined Data - Human Health				
Summary Statistics for			2,4,6-Trinitrotoluene	
Number of Samples			72	
Minimum			9.50E-05	
Maximum			20	
Mean			0.41	
Median			0.00	
Standard Deviation			2.47	
Variance			6.08	
Coefficient of Variation			6.02	
Skewness			7.47	
Lilliefors Test Statisitic			0.391244781	
Lilliefors 5% Critical Value			0.104416101	
Data not Lognormal at 5% Significance Level				
Data not Normal: Try Non-parametric UCL				
95	% UCL (Assuming Normal Data)			
Student's-t			0.89	
95	% UCL (Adjusted for Skewness)			
Adjusted-CLT			1.16	
Modified-t			0.94	
95	% Non-parametric UCL			
CLT			0.89	
Jackknife			0.89	
Standard Bootstrap			0.88	
Bootstrap-t			4.51	
Chebyshev (Mean, Std)			1.68	

Combined Data - Ecological		
Summary Statistics for	Arsenic	
Number of Samples	239	
Minimum	0.42	
Maximum	38	
Mean	4.81	
Median	3.31	
Standard Deviation	4.34	
Variance	18.82	
Coefficient of Variation	0.90	
Skewness	2.87	
Lilliefors Test Statisitic	0.168581	
Lilliefors 5% Critical Value	0.057311	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	5.28	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	5.33	
Modified-t	5.28	
95 % Non-parametric UCL		
CLT	5.27	
Jackknife	5.28	
Standard Bootstrap	5.27	
Bootstrap-t	5.33	
Chebyshev (Mean, Std)	6.04	

Combined Data - Ecological		
Summary Statistics for	Barium	
Number of Samples	239	
Minimum	24	
Maximum	465	
Mean	142.80	
Median	121.00	
Standard Deviation	84.92	
Variance	7212.25	
Coefficient of Variation	0.59	
Skewness	1.83	
Lilliefors Test Statisitic	0.06239	
Lilliefors 5% Critical Value	0.057311	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	151.87	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	152.53	
Modified-t	151.98	
95 % Non-parametric UCL		
CLT	151.84	
Jackknife	151.87	
Standard Bootstrap	151.76	
Bootstrap-t	153.12	
Chebyshev (Mean, Std)	166.74	

Combined Data - Ecological		
Summary Statistics for	Cadmium	
Number of Samples	239	
Minimum	0.0025	
Maximum	6.02	
Mean	0.52	
Median	0.23	
Standard Deviation	0.86	
Variance	0.74	
Coefficient of Variation	1.66	
Skewness	4.56	
Lilliefors Test Statisitic	0.124104	
Lilliefors 5% Critical Value	0.057311	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.61	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	0.63	
Modified-t	0.61	
95 % Non-parametric UCL		
CLT	0.61	
Jackknife	0.61	
Standard Bootstrap	0.61	
Bootstrap-t	0.63	
Chebyshev (Mean, Std)	0.76	

Combined Data - Ecological		
Summary Statistics for	Chromium	
Number of Samples	239	
Minimum	2.5	
Maximum	84	
Mean	10.62	
Median	10.30	
Standard Deviation	8.31	
Variance	69.03	
Coefficient of Variation	0.78	
Skewness	4.85	
Lilliefors Test Statisitic	0.170224	
Lilliefors 5% Critical Value	0.057311	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	11.50	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	11.68	
Modified-t	11.53	
95 % Non-parametric UCL		
CLT	11.50	
Jackknife	11.50	
Standard Bootstrap	11.46	
Bootstrap-t	11.77	
Chebyshev (Mean, Std)	12.96	

Combined Data - Ecological				
Summary Statistics for			Copper	
Number of Samples			165	
Minimum			4.48	
Maximum			684	
Mean			32.27	
Median			15.40	
Standard Deviation			82.23	
Variance			6762.54	
Coefficient of Variation			2.55	
Skewness			6.04	
Lilliefors Test Statisitic			0.18271	
Lilliefors 5% Critical Value			0.068975	
Data not Lognormal at 5% Significance Level				
Data not Normal: Try Non-parametric UCL				
95	% UCL (Assuming Normal Data)			
Student's-t			42.86	
95	% UCL (Adjusted for Skewness)			
Adjusted-CLT			46.02	
Modified-t			43.36	
95	% Non-parametric UCL			
CLT			42.80	
Jackknife			42.86	
Standard Bootstrap			42.87	
Bootstrap-t			50.14	
Chebyshev (Mean, Std)			60.18	

Combined Data - Ecological		
Summary Statistics for	Lead	
Number of Samples	239	
Minimum	0.0752	
Maximum	4150	
Mean	47.79	
Median	9.40	
Standard Deviation	355.45	
Variance	126342.69	
Coefficient of Variation	7.44	
Skewness	10.89	
Lilliefors Test Statisitic	0.1417355	
Lilliefors 5% Critical Value	0.0573106	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	85.76	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	102.91	
Modified-t	88.46	
95 % Non-parametric UCL		
CLT	85.61	
Jackknife	85.76	
Standard Bootstrap	85.38	
Bootstrap-t	705.53	
Chebyshev (Mean, Std)	148.01	

Combined Data - Ecological		
Summary Statistics for	Mercury	
Number of Samples	239	
Minimum	0.001125	
Maximum	0.585	
Mean	0.04	
Median	0.02	
Standard Deviation	0.07	
Variance	0.01	
Coefficient of Variation	1.90	
Skewness	4.88	
Lilliefors Test Statisitic	0.107996	
Lilliefors 5% Critical Value	0.057311	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.05	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	0.05	
Modified-t	0.05	
95 % Non-parametric UCL		
CLT	0.05	
Jackknife	0.05	
Standard Bootstrap	0.05	
Bootstrap-t	0.05	
Chebyshev (Mean, Std)	0.06	

Combined Data - Ecological		
Summary Statistics for	Nickel	
Number of Samples	239	
Minimum	2	
Maximum	252	
Mean	10.34	
Median	9.30	
Standard Deviation	17.12	
Variance	293.14	
Coefficient of Variation	1.66	
Skewness	12.22	
Lilliefors Test Statisitic	0.224717	
Lilliefors 5% Critical Value	0.057311	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	12.17	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	13.09	
Modified-t	12.31	
95 % Non-parametric UCL		
CLT	12.16	
Jackknife	12.17	
Standard Bootstrap	12.16	
Bootstrap-t	15.14	
Chebyshev (Mean, Std)	15.16	

Combined Data - Ecological		
Summary Statistics for	Selenium	
Number of Samples	239	
Minimum	0.035	
Maximum	59	
Mean	4.66	
Median	0.30	
Standard Deviation	10.18	
Variance	103.72	
Coefficient of Variation	2.19	
Skewness	2.37	
Lilliefors Test Statisitic	0.169363	
Lilliefors 5% Critical Value	0.057311	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	5.75	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	5.85	
Modified-t	5.76	
95 % Non-parametric UCL		
CLT	5.74	
Jackknife	5.75	
Standard Bootstrap	5.75	
Bootstrap-t	5.86	
Chebyshev (Mean, Std)	7.53	

Combined Data - Ecological		
Summary Statistics for	Silver	
Number of Samples	239	
Minimum	0.0106	
Maximum	60.5	
Mean	1.18	
Median	0.15	
Standard Deviation	6.42	
Variance	41.23	
Coefficient of Variation	5.45	
Skewness	8.12	
Lilliefors Test Statisitic	0.093331	
Lilliefors 5% Critical Value	0.057311	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	1.86	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	2.09	
Modified-t	1.90	
95 % Non-parametric UCL		
CLT	1.86	
Jackknife	1.86	
Standard Bootstrap	1.84	
Bootstrap-t	2.33	
Chebyshev (Mean, Std)	2.99	

Combined Data - Ecological		
Summary Statistics for	Zinc	
Number of Samples	181	
Minimum	5	
Maximum	225	
Mean	41.00	
Median	35.50	
Standard Deviation	31.46	
Variance	989.54	
Coefficient of Variation	0.77	
Skewness	3.35	
Lilliefors Test Statisitic	0.109043	
Lilliefors 5% Critical Value	0.065856	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	44.86	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	45.46	
Modified-t	44.96	
95 % Non-parametric UCL		
CLT	44.84	
Jackknife	44.86	
Standard Bootstrap	45.07	
Bootstrap-t	46.18	
Chebyshev (Mean, Std)	51.19	

Combined Data - Ecological		
Summary Statistics for	m-Dintrobenzene	
Number of Samples	18	
Minimum	0.00205	
Maximum	0.15	
Mean	0.02	
Median	0.00	
Standard Deviation	0.05	
Variance	0.00	
Coefficient of Variation	2.14	
Skewness	2.15	
Shapiro-Wilk Test Statisitic	0.467562026	
Shapiro-Wilk 5% Critical Value	0.897	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.04	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	0.05	
Modified-t	0.04	
95 % Non-parametric UCL		
CLT	0.04	
Jackknife	0.04	
Standard Bootstrap	0.04	
Bootstrap-t	0.06	
Chebyshev (Mean, Std)	0.07	

Combined Data - Ecological		
Summary Statistics for	bis (2-Ethylhexyl) phthalate	
Number of Samples	21	
Minimum	0.081	
Maximum	0.342	
Mean	0.10	
Median	0.08	
Standard Deviation	0.06	
Variance	0.00	
Coefficient of Variation	0.60	
Skewness	4.58	
Shapiro-Wilk Test Statisitic	0.24618169	
Shapiro-Wilk 5% Critical Value	0.908	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.12	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	0.13	
Modified-t	0.12	
95 % Non-parametric UCL		
CLT	0.12	
Jackknife	0.12	
Standard Bootstrap	0.11	
Bootstrap-t	1.54	
Chebyshev (Mean, Std)	0.15	

Combined Data - Ecological		
Summary Statistics for	HMX	
Number of Samples	61	
Minimum	8.00E-05	
Maximum	5.6	
Mean	0.28	
Median	0.00	
Standard Deviation	1.08	
Variance	1.16	
Coefficient of Variation	3.84	
Skewness	4.31	
Lilliefors Test Statisitic	0.373631541	
Lilliefors 5% Critical Value	0.113440676	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.51	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	0.59	
Modified-t	0.52	
95 % Non-parametric UCL		
CLT	0.51	
Jackknife	0.51	
Standard Bootstrap	0.50	
Bootstrap-t	0.70	
Chebyshev (Mean, Std)	0.88	

Combined Data - Ecological		
Summary Statistics for	Pentachlorophenol	
Number of Samples	20	
Minimum	0.01	
Maximum	0.203	
Mean	0.08	
Median	0.08	
Standard Deviation	0.03	
Variance	0.00	
Coefficient of Variation	0.38	
Skewness	2.16	
Shapiro-Wilk Test Statisitic	0.407560194	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.10	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	0.10	
Modified-t	0.10	
95 % Non-parametric UCL		
CLT	0.10	
Jackknife	0.10	
Standard Bootstrap	0.10	
Bootstrap-t	0.18	
Chebyshev (Mean, Std)	0.12	

Combined Data - Ecological		
Summary Statistics for	RDX	
Number of Samples	39	
Minimum	0.0001	
Maximum	19.9	
Mean	0.58	
Median	0.12	
Standard Deviation	3.18	
Variance	10	
Coefficient of Variation	5.51	
Skewness	6.24	
Shapiro-Wilk Test Statisitic	0.811385157	
Shapiro-Wilk 5% Critical Value	0.939	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	1.43	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.96	
Modified-t	1.52	
95 % Non-parametric UCL		
CLT	1.41	
Jackknife	1.43	
Standard Bootstrap	1.40	
Bootstrap-t	28.22	
Chebyshev (Mean, Std)	2.79	

Combined Data - Ecological		
Summary Statistics for	2,4,6-Trinitrotoluene	
Number of Samples	72	
Minimum	9.50E-05	
Maximum	20	
Mean	0.41	
Median	0.00	
Standard Deviation	2.47	
Variance	6.08	
Coefficient of Variation	6.02	
Skewness	7.47	
Lilliefors Test Statisitic	0.391244781	
Lilliefors 5% Critical Value	0.104416101	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.89	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.16	
Modified-t	0.94	
95 % Non-parametric UCL		
CLT	0.89	
Jackknife	0.89	
Standard Bootstrap	0.88	
Bootstrap-t	4.49	
Chebyshev (Mean, Std)	1.68	

Human Health Debris Pile and Pit (8Y/58B)		
Summary Statistics for	Nickel	
Number of Samples	25	
Minimum	5.98	
Maximum	815	
Mean	52.93	
Median	11.60	
Standard Deviation	165.91	
Variance	27527.38	
Coefficient of Variation	3.13	
Skewness	4.45	
Shapiro-Wilk Test Statisitic	0.519	
Shapiro-Wilk 5% Critical Value	0.918	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	135.63	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	188.33	
Modified-t	140.55	
95 % Non-parametric UCL		
CLT	130.13	
Jackknife	135.63	
Standard Bootstrap	129.33	
Bootstrap-t	3806.86	
Chebyshev (Mean, Std)	383.10	

Human Health Debris Pile and Pit (8Y/58B)		
Summary Statistics for	2,4,6-Trinitrotoluene	
Number of Samples	20	
Minimum	9.50E-05	
Maximum	20	
Mean	1.00744025	
Median	0.0014775	
Standard Deviation	4.470470203	
Variance	19.98510384	
Coefficient of Variation	4.437454433	
Skewness	4.471851899	
Shapiro-Wilk Test Statisitic	0.71585978	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	2.735928739	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	3.719729863	
Modified-t	2.902522745	
95 % Non-parametric UCL		
CLT	2.651681214	
Jackknife	2.735928739	
Standard Bootstrap	2.600006848	
Bootstrap-t	3255.94561	
Chebyshev (Mean, Std)	5.36471562	

Ecological Debris Pile and Pit (8Y/58B)		
Summary Statistics for	Chromium	
Number of Samples	20	
Minimum	8.38	
Maximum	61.8	
Mean	15.369	
Median	12.8	
Standard Deviation	11.17954236	
Variance	124.9821674	
Coefficient of Variation	0.727408573	
Skewness	4.146427861	
Shapiro-Wilk Test Statisitic	0.696262489	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	19.691523	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	21.95739905	
Modified-t	20.07781605	
95 % Non-parametric UCL		
CLT	19.48084074	
Jackknife	19.691523	
Standard Bootstrap	19.33747387	
Bootstrap-t	30.98314685	
Chebyshev (Mean, Std)	26.26547002	

Ecological Debris Pile and Pit (8Y/58B)		
Summary Statistics for	Copper	
Number of Samples	20	
Minimum	16.5	
Maximum	543	
Mean	110.88	
Median	30.8	
Standard Deviation	162.7468024	
Variance	26486.52168	
Coefficient of Variation	1.467774192	
Skewness	1.895907458	
Shapiro-Wilk Test Statisitic	0.784719895	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	173.8053662	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	187.2230085	
Modified-t	176.3766402	
95 % Non-parametric UCL		
CLT	170.7383476	
Jackknife	173.8053662	
Standard Bootstrap	168.590032	
Bootstrap-t	206.8110889	
Chebyshev (Mean, Std)	269.5059613	

Ecological Debris Pile and Pit (8Y/58B)		
Summary Statistics for	Lead	
Number of Samples	20	
Minimum	0.0752	
Maximum	58.5	
Mean	12.23739	
Median	9.77	
Standard Deviation	14.2814112	
Variance	203.9587057	
Coefficient of Variation	1.167030813	
Skewness	2.067871918	
Shapiro-Wilk Test Statisitic	0.840379272	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	17.75923753	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	19.06787489	
Modified-t	18.00533861	
95 % Non-parametric UCL		
CLT	17.4900995	
Jackknife	17.75923753	
Standard Bootstrap	17.39974236	
Bootstrap-t	21.52660086	
Chebyshev (Mean, Std)	26.15718779	

Ecological Debris Pile and Pit (8Y/58B)		
Summary Statistics for	Nickel	
Number of Samples	20	
Minimum	8.41	
Maximum	252	
Mean	23.9355	
Median	11.75	
Standard Deviation	53.70455969	
Variance	2884.179731	
Coefficient of Variation	2.243719984	
Skewness	4.465545974	
Shapiro-Wilk Test Statisitic	0.416665715	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	44.70014198	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	56.50062819	
Modified-t	46.69864348	
95 % Non-parametric UCL		
CLT	43.68806136	
Jackknife	44.70014198	
Standard Bootstrap	42.94378171	
Bootstrap-t	511.6806825	
Chebyshev (Mean, Std)	76.28022987	

Ecological Debris Pile and Pit (8Y/58B)		
Summary Statistics for	Silver	
Number of Samples	20	
Minimum	0.0155	
Maximum	6.71	
Mean	0.932565	
Median	0.1505	
Standard Deviation	1.800566196	
Variance	3.242038627	
Coefficient of Variation	1.930767503	
Skewness	2.334436094	
Shapiro-Wilk Test Statisitic	0.848930672	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	1.628746342	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.819378768	
Modified-t	1.663773898	
95 % Non-parametric UCL		
CLT	1.594814062	
Jackknife	1.628746342	
Standard Bootstrap	1.553423364	
Bootstrap-t	2.253696119	
Chebyshev (Mean, Std)	2.687539842	

Ecological Debris Pile and Pit (8Y/58B)		
Summary Statistics for	Zinc	
Number of Samples	20	
Minimum	33.3	
Maximum	225	
Mean	58.5	
Median	45.7	
Standard Deviation	43.29139941	
Variance	1874.145263	
Coefficient of Variation	0.740023922	
Skewness	3.463979364	
Shapiro-Wilk Test Statisitic	0.665040146	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	75.23843738	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	82.43434538	
Modified-t	76.48810834	
95 % Non-parametric UCL		
CLT	74.42259629	
Jackknife	75.23843738	
Standard Bootstrap	74.28210096	
Bootstrap-t	144.78182	
Chebyshev (Mean, Std)	100.6952367	

Ecological Debris Pile and Pit (8Y/58B)		
Summary Statistics for	HMX	
Number of Samples	20	
Minimum	8.00E-05	
Maximum	5.6	
Mean	0.78158275	
Median	0.00265	
Standard Deviation	1.803393516	
Variance	3.252228173	
Coefficient of Variation	2.307360949	
Skewness	2.176892669	
Shapiro-Wilk Test Statisitic	0.784047688	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	1.478857263	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.654610096	
Modified-t	1.511572214	
95 % Non-parametric UCL		
CLT	1.444871701	
Jackknife	1.478857263	
Standard Bootstrap	1.435379743	
Bootstrap-t	1.919548246	
Chebyshev (Mean, Std)	2.539313322	

Ecological Debris Pile and Pit (8Y/58B)		
Summary Statistics for	2,4,6-Trinitrotoluene	
Number of Samples	20	
Minimum	9.50E-05	
Maximum	20	
Mean	1.00744025	
Median	0.0014775	
Standard Deviation	4.470470203	
Variance	19.98510384	
Coefficient of Variation	4.437454433	
Skewness	4.471851899	
Shapiro-Wilk Test Statisitic	0.71585978	
Shapiro-Wilk 5% Critical Value	0.905	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	2.735928739	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	3.719729863	
Modified-t	2.902522745	
95 % Non-parametric UCL		
CLT	2.651681214	
Jackknife	2.735928739	
Standard Bootstrap	2.600006848	
Bootstrap-t	3255.94561	
Chebyshev (Mean, Std)	5.36471562	

Pile of Fire Bricks (58FF) - Human Health		
Summary Statistics for	Arsenic	
Number of Samples	94	
Minimum	0.0106	
Maximum	103.0000	
Mean	6.3015	
Median	2.8600	
Standard Deviation	11.4704	
Variance	131.5706	
Coefficient of Variation	1.8203	
Skewness	6.7207	
Lilliefors Test Statisitic	0.2334	
Lilliefors 5% Critical Value	0.0914	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	8.2670	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	9.1237	
Modified-t	8.4037	
95 % Non-parametric UCL		
CLT	8.2475	
Jackknife	8.2670	
Standard Bootstrap	8.3035	
Bootstrap-t	10.1763	
Chebyshev (Mean, Std)	11.4584	

Pile of Fire Bricks (58FF) - Human Health		
Summary Statistics for	Beryllium	
Number of Samples	94	
Minimum	0.139	
Maximum	79.300	
Mean	2.762	
Median	0.478	
Standard Deviation	10.596	
Variance	112.279	
Coefficient of Variation	3.836	
Skewness	5.834	
Lilliefors Test Statisitic	0.216	
Lilliefors 5% Critical Value	0.091	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	4.578	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	5.263	
Modified-t	4.688	
95 % Non-parametric UCL		
CLT	4.560	
Jackknife	4.578	
Standard Bootstrap	4.553	
Bootstrap-t	7.138	
Chebyshev (Mean, Std)	7.526	

Pile of Fire Bricks (58FF) - Human Health		
Summary Statistics for	Lead	
Number of Samples	94	
Minimum	1.36	
Maximum	15000	
Mean	237.71	
Median	6.66	
Standard Deviation	1668.14	
Variance	2782696.35	
Coefficient of Variation	7.02	
Skewness	8.13	
Lilliefors Test Statisitic	0.25	
Lilliefors 5% Critical Value	0.09	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	523.56	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	674.80	
Modified-t	547.60	
95 % Non-parametric UCL		
CLT	520.72	
Jackknife	523.56	
Standard Bootstrap	510.92	
Bootstrap-t	25425	
Chebyshev (Mean, Std)	987.68	

Pile of Fire Bricks (58FF) - Human Health		
Summary Statistics for	Nickel	
Number of Samples	94	
Minimum	1.9	
Maximum	3960.0	
Mean	69.4	
Median	10.2	
Standard Deviation	414.3	
Variance	171681.9	
Coefficient of Variation	6.0	
Skewness	9.1	
Lilliefors Test Statisitic	0.2	
Lilliefors 5% Critical Value	0.1	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	140.4	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	182.8	
Modified-t	147.1	
95 % Non-parametric UCL		
CLT	139.7	
Jackknife	140.4	
Standard Bootstrap	137.4	
Bootstrap-t	440.4	
Chebyshev (Mean, Std)	255.7	

Pile of Fire Bricks (58FF) - Ecological					
Summary Statistics for	Barium		Summary Statistics for	ln(Barium)	
Number of Samples	24		Minimum	3.84	
Minimum	46.5		Maximum	5.76	
Maximum	318		Mean	4.94	
Mean	150.02		Standard Deviation	0.39	
Median	146.50		Variance	0.15	
Standard Deviation	56.32				
Variance	3171.58		Shapiro-Wilk Test Statisitic	0.95	
Coefficient of Variation	0.38		Shapiro-Wilk 5% Critical Value	0.92	
Skewness	1.06		Data are Lognormal at 5% Significance Level		
95 % UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution		
Student's-t	169.72		MLE Mean	151.04	
			MLE Standard Deviation	60.44	
95 % UCL (Adjusted for Skewness)			MLE Coefficient of Variation	0.40	
Adjusted-CLT	171.58		MLE Skewness	1.26	
Modified-t	170.14		MLE Median	140.23	
			MLE 80% Quantile	194.21	
95 % Non-parametric UCL			MLE 90% Quantile	230.10	
CLT	168.93		MLE 95% Quantile	264.35	
Jackknife	169.72		MLE 99% Quantile	343.69	
Standard Bootstrap	168.64				
Bootstrap-t	173.33		MVU Estimate of Median	139.79	
Chebyshev (Mean, Std)	200.13		MVU Estimate of Mean	150.54	
			MVU Estimate of Std. Dev.	59.52	
			MVU Estimate of SE of Mean	12.13	
			UCL Assuming Lognormal Distribution		
			95% H-UCL	175.67	
			95% Chebyshev (MVUE) UCL	203.44	
			99% Chebyshev (MVUE) UCL	271.28	
			Recommended UCL to use:		
			Student's-t or H-UCL		

Pile of Fire Bricks (58FF) - Ecological		
Summary Statistics for	Chromium	
Number of Samples	24	
Minimum	6.11	
Maximum	43.50	
Mean	12.32	
Median	10.30	
Standard Deviation	7.66	
Variance	58.61	
Coefficient of Variation	0.62	
Skewness	3.26	
Shapiro-Wilk Test Statisitic	0.89	
Shapiro-Wilk 5% Critical Value	0.92	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95	% UCL (Assuming Normal Data)	
Student's-t	15.00	
95	% UCL (Adjusted for Skewness)	
Adjusted-CLT	16.00	
Modified-t	15.17	
95	% Non-parametric UCL	
CLT	14.89	
Jackknife	15.00	
Standard Bootstrap	14.82	
Bootstrap-t	18.27	
Chebyshev (Mean, Std)	19.13	

Pile of Fire Bricks (58FF) - Ecological							
Summary Statistics for	Lead						ln(Lead)
Number of Samples	24		Minimum				0.31
Minimum	1.36		Maximum				4.79
Maximum	120		Mean				2.72
Mean	23.80		Standard Deviation				0.98
Median	18.65		Variance				0.96
Standard Deviation	26.67						
Variance	711.04		Shapiro-Wilk Test Statisitic				0.97
Coefficient of Variation	1.12		Shapiro-Wilk 5% Critical Value				0.92
Skewness	2.53		Data are Lognormal at 5% Significance Level				
95 % UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution				
Student's-t	33.13		MLE Mean				24.53
			MLE Standard Deviation				31.05
95 % UCL (Adjusted for Skewness)			MLE Coefficient of Variation				1.27
Adjusted-CLT	35.75		MLE Skewness				5.83
Modified-t	33.60		MLE Median				15.20
			MLE 80% Quantile				34.74
95 % Non-parametric UCL			MLE 90% Quantile				53.43
CLT	32.75		MLE 95% Quantile				75.98
Jackknife	33.13		MLE 99% Quantile				147.89
Standard Bootstrap	32.35						
Bootstrap-t	40.08		MVU Estimate of Median				14.90
Chebyshev (Mean, Std)	47.52		MVU Estimate of Mean				23.85
			MVU Estimate of Std. Dev.				27.37
			MVU Estimate of SE of Mean				5.38
			UCL Assuming Lognormal Distribution				
			95% H-UCL				40.78
			95% Chebyshev (MVUE) UCL				47.28
			99% Chebyshev (MVUE) UCL				77.34
			Recommended UCL to use:				
				H-UCL			

Pile of Fire Bricks (58FF) - Ecological		
Summary Statistics for	Nickel	
Number of Samples	24	
Minimum	4.98	
Maximum	61.10	
Mean	11.43	
Median	9.29	
Standard Deviation	10.81	
Variance	116.93	
Coefficient of Variation	0.95	
Skewness	4.56	
Shapiro-Wilk Test Statisitic	0.75	
Shapiro-Wilk 5% Critical Value	0.92	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	15.21	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	17.25	
Modified-t	15.55	
95 % Non-parametric UCL		
CLT	15.06	
Jackknife	15.21	
Standard Bootstrap	14.99	
Bootstrap-t	24.90	
Chebyshev (Mean, Std)	21.05	

Pile of Fire Bricks (58FF) - Ecological						
Summary Statistics for			Zinc		Summary Statistics for	ln(Zinc)
Number of Samples			10		Minimum	2.88
Minimum			17.90		Maximum	4.25
Maximum			70.20		Mean	3.43
Mean			34.33		Standard Deviation	0.47
Median			28.90		Variance	0.22
Standard Deviation			17.04			
Variance			290.20		Shapiro-Wilk Test Statisitic	0.94
Coefficient of Variation			0.50		Shapiro-Wilk 5% Critical Value	0.84
Skewness			1.13		Data are Lognormal at 5% Significance Level	
95	% UCL (Assuming Normal Data)				Estimates Assuming Lognormal Distribution	
Student's-t			44.20		MLE Mean	34.60
					MLE Standard Deviation	17.09
95	% UCL (Adjusted for Skewness)				MLE Coefficient of Variation	0.49
Adjusted-CLT			45.24		MLE Skewness	1.60
Modified-t			44.52		MLE Median	31.02
					MLE 80% Quantile	46.04
95	% Non-parametric UCL				MLE 90% Quantile	56.55
CLT			43.19		MLE 95% Quantile	66.91
Jackknife			44.20		MLE 99% Quantile	91.99
Standard Bootstrap			42.58			
Bootstrap-t			49.08		MVU Estimate of Median	30.68
Chebyshev (Mean, Std)			57.81		MVU Estimate of Mean	34.19
					MVU Estimate of Std. Dev.	16.26
					MVU Estimate of SE of Mean	5.13
					UCL Assuming Lognormal Distribution	
					95% H-UCL	48.55
					95% Chebyshev (MVUE) UCL	56.57
					99% Chebyshev (MVUE) UCL	85.27
					Recommended UCL to use:	
					Student's-t or H-UCL	

ANNEX B
RFI Results for Soil Removed During VCM/VCA Activities
(Not Applicable to Risk Assessment Analysis)

LIST OF FIGURES

Figure

B-1 RFI sample locations at the Area of Open Burning (Features 8PP and 8RR), November 1996 ..... B-5

B-2 Confirmatory sample locations at the Area of Open Burning (Features 8PP and 8RR), June 1997 ..... B-7

B-3 Verification sample locations at the Area of Open Burning (Features 8PP and 8RR), August 1998..... B-9

B-4 Surface and subsurface sample locations at the Area of Open Burning (Features 8PP and 8RR), June–July 1999 ..... B-11

B-5 Surface and subsurface sample locations at the Area of Open Burning (Features 8PP and 8RR), March 2000 ..... B-13

B-6 Surface sample location at the center of Feature 58FF B-15

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LIST OF TABLES

Table

B-1 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling, Metals Analytical Results, November 1996 (On- and Off-Site Laboratories)..... B-17

B-2 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling, Gamma Spectroscopy Analytical Results, November 1996 (On-Site Laboratory) B-19

B-3 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling, HE Compound Analytical MDLs, November 1996 (On- and Off-Site Laboratories)..... B-21

B-4 Summary of SWMU 8, Feature 8Y, RFI Soil Sampling, Metals Analytical Results, November 1996 and January 1998 (On- and Off-Site Laboratories)..... B-22

B-5 Summary of SWMU 58, Feature 58B, RFI Soil Sampling, Metals Analytical Results, April 1996 and November 1997 (On- and Off-Site Laboratories)..... B-26

B-6 Summary of SWMU 8, Feature 8Y, RFI Soil Sampling, Gamma Spectroscopy Analytical Results, November 1996 (On-Site Laboratory)..... B-30

B-7 Summary of SWMU 8, Feature 8Y, RFI Soil Sampling, HE Compound Analytical Results, November 1996 and January 1998 (On- and Off-Site Laboratories)..... B-31

B-8 Summary of SWMU 8, Feature 8Y, RFI Soil Sampling, HE Compound Analytical MDLs, November 1996 and January 1998 (On- and Off-Site Laboratories)..... B-33

B-9 Summary of SWMU 8, Feature 8Y, RFI Soil Sampling, HE Compound Analytical Results, July 1998 (Off-Site Laboratory) B-34

B-10 Summary of SWMU 8, Feature 8Y, RFI Soil Sampling, Tritium Analytical Results, July 1998 (Off-Site Laboratory) B-35

B-11 Summary of SWMU 8, Feature 8Y, RFI Soil Sampling, Gamma Spectroscopy Analytical Results, July 1998 (On-Site Laboratory)..... B-36

B-12 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Verification Soil Sampling, Metals Analytical Results, June 1997 (Off-Site Laboratory) B-38

LIST OF TABLES (Concluded)

Table

B-13 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Soil Sampling, Gamma Spectroscopy Analytical Results, June 1997 (On-Site Laboratory) B-41

B-14 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Soil Verification Sampling, Metals Analytical Results, August 1998 (Off-Site Laboratory) B-43

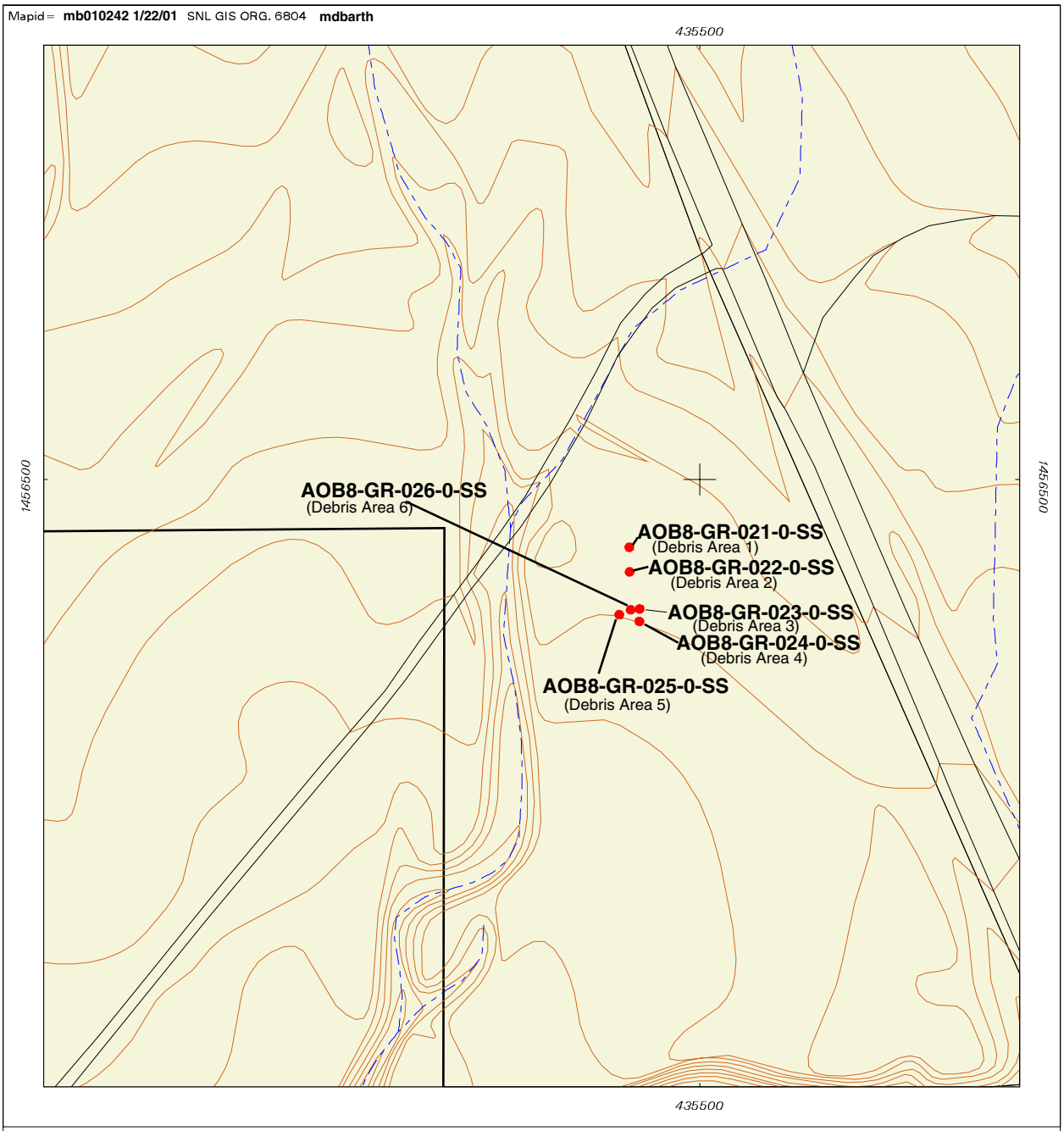
B-15 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) MACTECH VCM Soil Verification Sampling, Gamma and Alpha Spectroscopy Analytical Results, August 1998 (On- and Off-Site Laboratories)..... B-44

B-16 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling, Metals Analytical Results, June–July 1999 (On-Site Laboratory) B-45

B-17 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling, Metals Analytical Results, March 2000 (On-Site Laboratory) B-57

B-18 Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling, Gamma Spectroscopy Analytical Results, March 2000 (On-Site Laboratory) B-63

B-19 Summary of SWMU 58, Feature 58FF Soil Sampling, Metals Analytical Results, April 1996 (Off-Site Laboratory)..... B-67



Legend

- RFI Sample location (ID information: AOB8=SWMU sample location; GR=grab sample; 021=sample number; 0=sample depth;SS=soil sample
- Road
- 2-Foot Contour
- Surface Drainage
- SWMU 8 Boundary

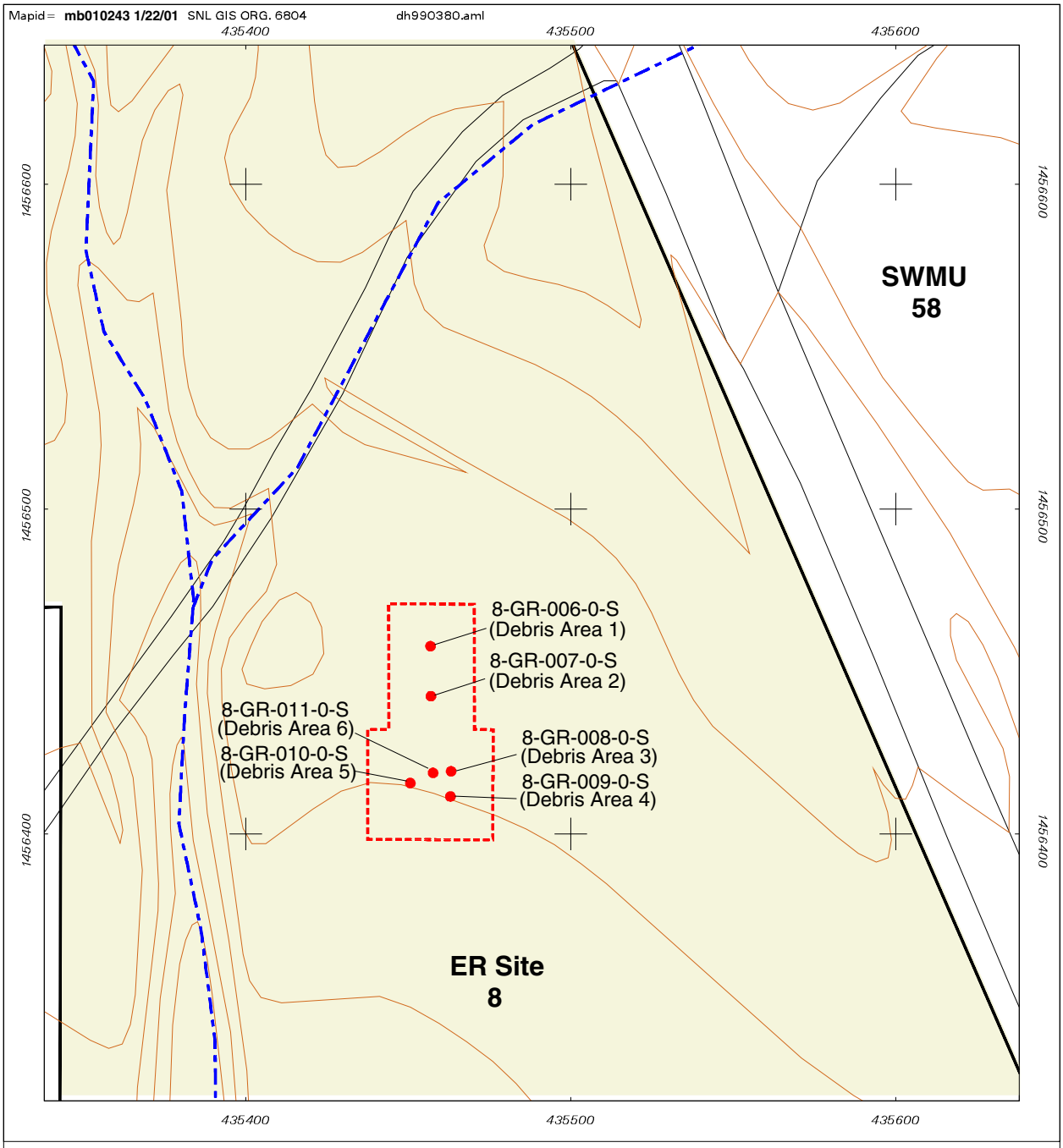
Figure B-1
RFI Sample Locations at
the Area of Open Burning
(Features 8PP and 8RR)
November 1996

0 50 100
Scale in Feet

0 12 24
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A33



Legend

- Former debris location
- Road
- 5-Foot Contour
- Surface Drainage
- Debris area in Open Burn Area
- SWMU 8

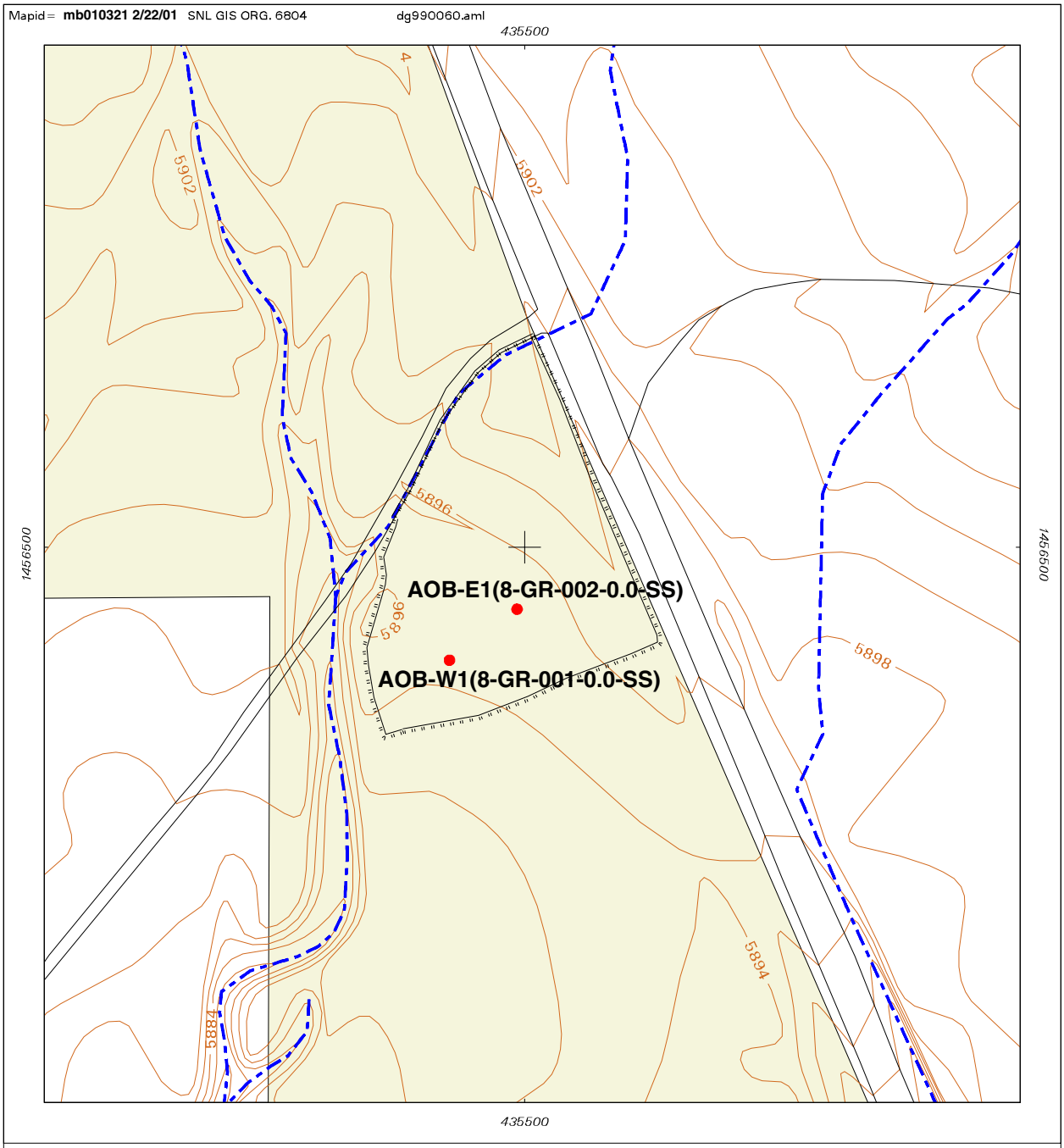
Figure B-2
Confirmatory sample locations at the
Area of Open Burning
(Features 8PP and 8RR) June 1997

0 25 50
Scale in Feet

0 6 12
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A32



Legend

- Anomaly/VCM verification sample location (ID information:8=SWMU number; GR=grab sample; 001=sample number; 0.0=sample depth; ss=soil sample)
- Road
- 5-Foot Contour
- Radiological survey boundary (mowed area) and approximate boundary of Area of Open Burning
- Surface Drainage
- SWMU 8

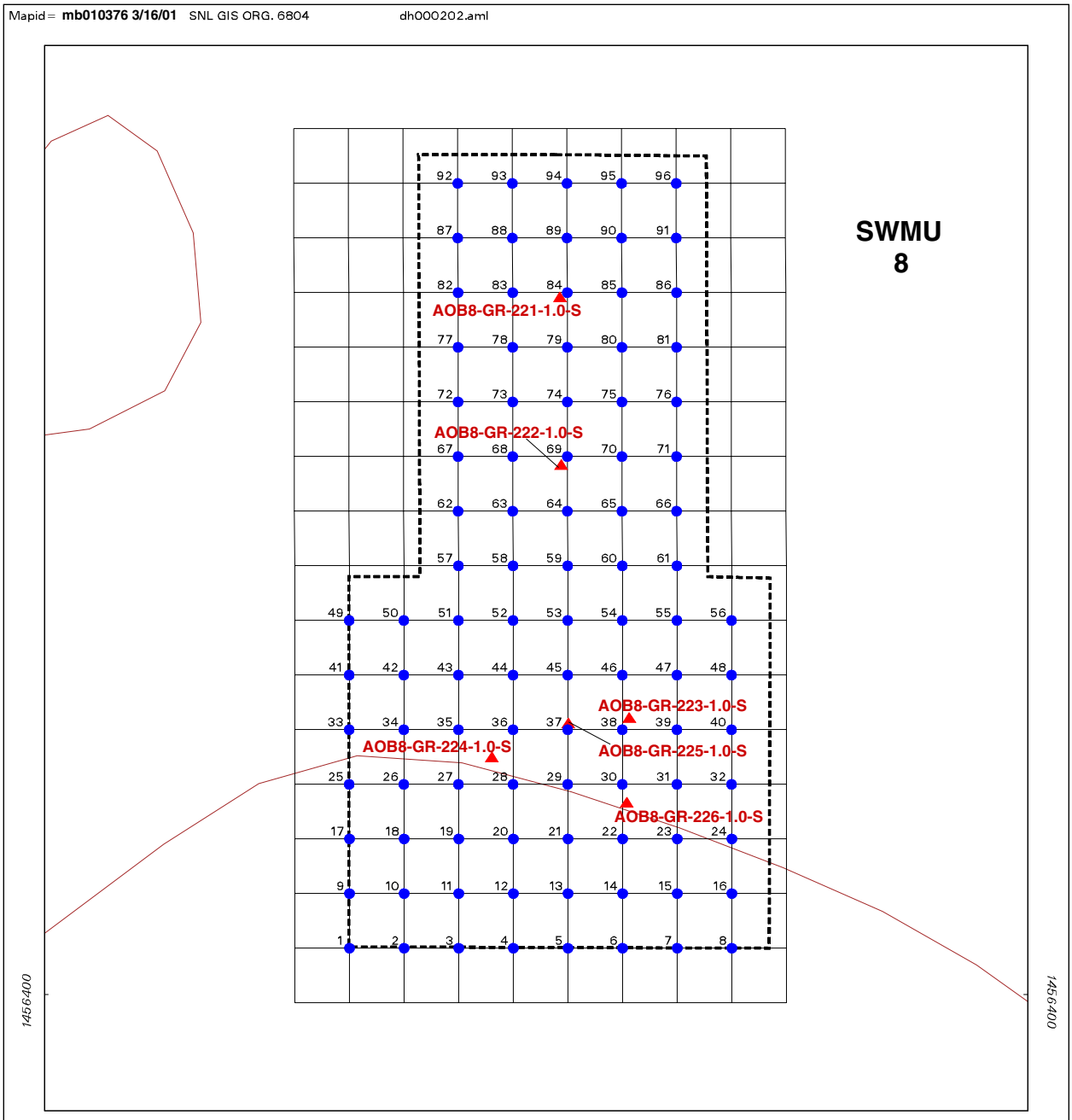
Figure B-3
Verification sample locations at the Area of Open Burning (Features 8PP and 8RR)
August 1998

0 50 100
Scale in Feet

0 12 24
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A31



Legend

- Subsurface sample location
- 92 Surface sample location (Entire ID Number is AOB8-GR-192-0.0-SS)
- 5-Foot Contour
- Debris area in Open Burn Area
- 5 Foot Grid

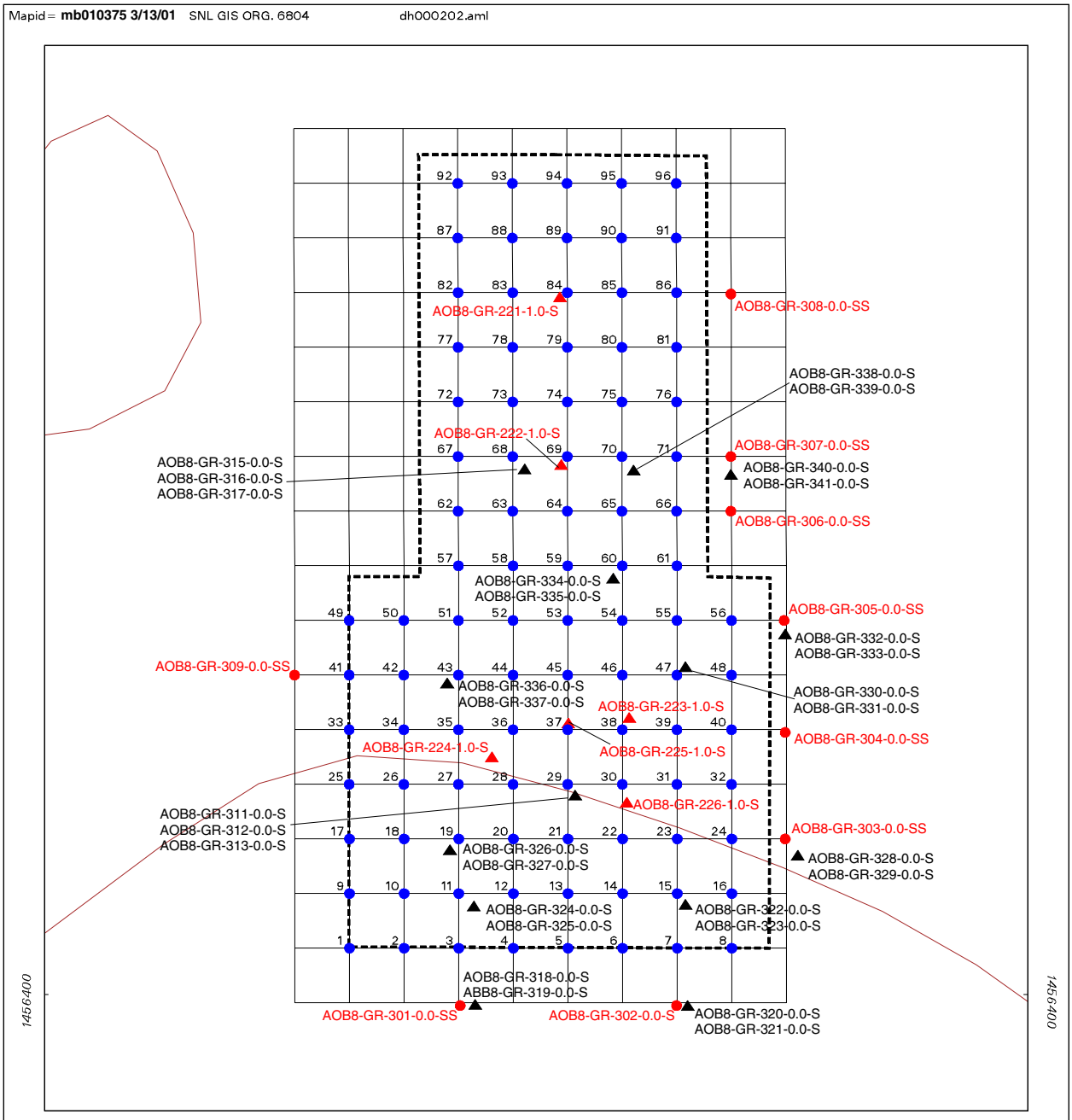
Figure B-4
Surface and subsurface sample locations at the Area of Open Burning (Features 8PP and 8RR)
June-July 1999

0 7.5 15
Scale in Feet

0 1.8 3.6
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A29



Legend

- March 2000 subsurface sample location
- March 2000 surface sample location
- June-July 1999 surface sample location
- June-July 1999 subsurface sample location
- 5-Foot Contour
- Debris area in Open Burn Area
- 5 Foot Grid

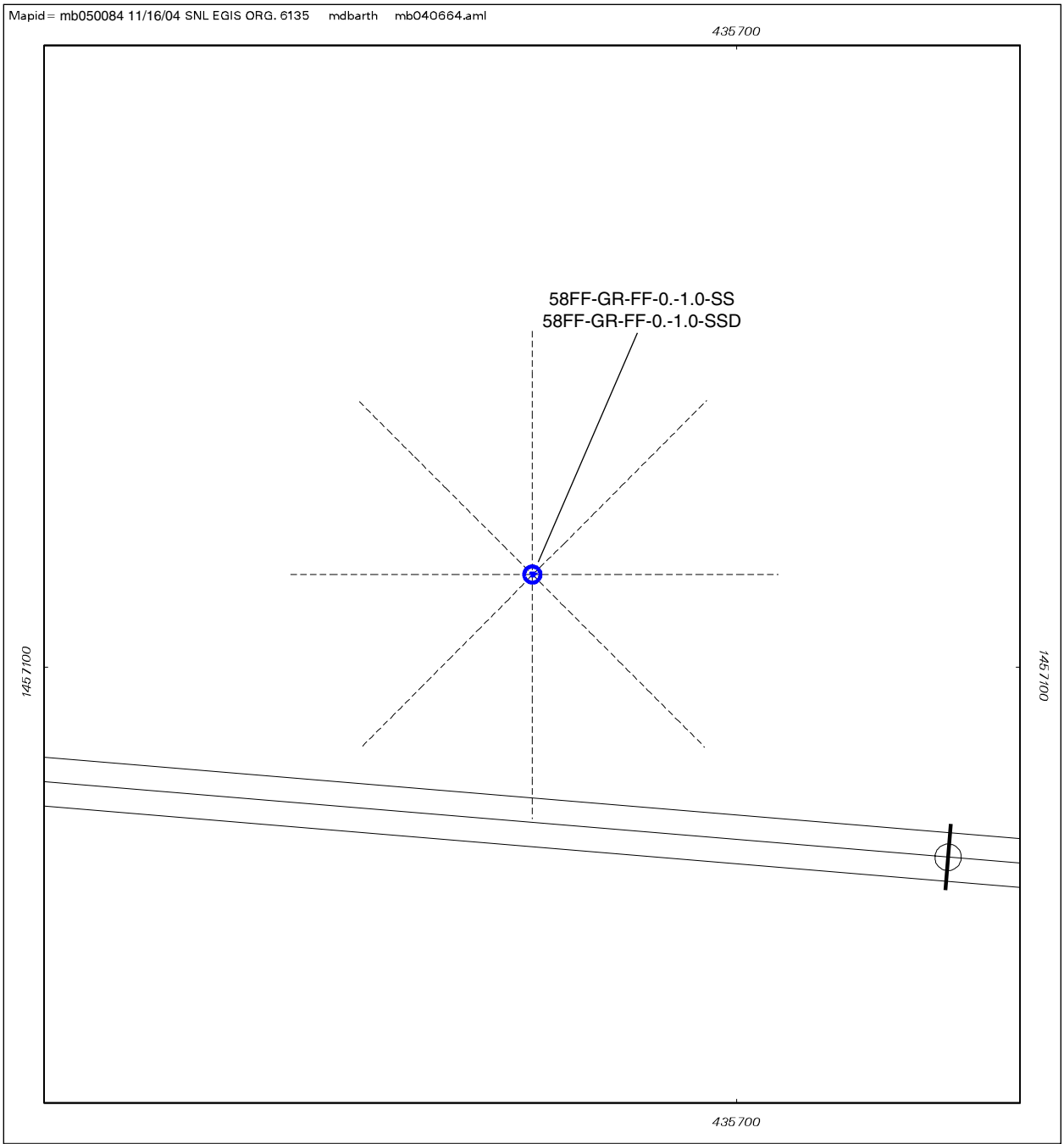
Figure B-5
Surface and subsurface sample locations at the Area of Open Burning (Features 8PP and 8RR)
March 2000

0 7.5 15
Scale in Feet

0 1.8 3.6
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A30



Legend

- Randomly selected sample location
- Power Pole
- Grid Line
- Power Line

Figure B-6
Surface sample location
at the center of Feature 58FF

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.06040000 A67

Table B-1
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
November 1996
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
6039	AOB8-GR-021-0-SS	Soil	11-21-96	0–0.5	3.2	110	0.72 J (0.76)	**24**	**110**	**150**
6042	AOB8-GR-021-0-SR	Soil	11-21-96	0–0.5	4.9	130	0.74 J (0.98)	**41**	**93 J**	**240 J**
6039	AOB8-GR-022-0-SS	Soil	11-21-96	0–0.5	2.2	70	0.44 J (0.76)	ND (0.54)	15	**76**
6039	AOB8-GR-023-0-SS	Soil	11-21-96	0–0.5	1.8	66	0.38 J (0.76)	**10**	**160**	**3,600**
6039	AOB8-GR-024-0-SS	Soil	11-21-96	0–0.5	3.7	37	0.35 J (0.76)	ND (0.54)	12	**170**
6042	AOB8-GR-024-0-SR	Soil	11-21-96	0–0.5	3.3	100	0.42 J (1.0)	**1.3**	16 J	**1,100 J**
6039	AOB8-GR-025-0-SS	Soil	11-21-96	0–0.5	1.6	22	0.3 J (0.76)	ND (0.54)	14	**360**
6039	AOB8-GR-026-0-SS	Soil	11-21-96	0–0.5	1.6	59	0.32 J (0.76)	**2.4**	12	**58**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
6039	AOB8-GR-021-0-SS	Soil	11-21-96	0–0.5	**2,100**	**ND (0.078)**	**50**	ND (0.47)	ND (0.095)	**2,400**
6042	AOB8-GR-021-0-SR	Soil	11-21-96	0–0.5	**370 J**	**ND (0.10 J)**	**30**	1.0	**ND (0.98)**	**1,400 J**
6039	AOB8-GR-022-0-SS	Soil	11-21-96	0–0.5	**6,400**	**ND (0.078)**	**44**	ND (0.47)	ND (0.095)	49
6039	AOB8-GR-023-0-SS	Soil	11-21-96	0–0.5	**7,400**	**ND (0.078)**	16	ND (0.47)	0.25 J (0.36)	**240**
6039	AOB8-GR-024-0-SS	Soil	11-21-96	0–0.5	**6,700**	**ND (0.078)**	8.5	ND (0.47)	ND (0.095)	36
6042	AOB8-GR-024-0-SR	Soil	11-21-96	0–0.5	**21,000 J**	**ND (0.10 J)**	11	0.76 J (1.0)	**ND (1.0)**	**120 J**
6039	AOB8-GR-025-0-SS	Soil	11-21-96	0–0.5	**11,000**	**ND (0.078)**	11	ND (0.47)	**0.79**	**76**
6039	AOB8-GR-026-0-SS	Soil	11-21-96	0–0.5	**1,400**	**ND (0.078)**	9.6	ND (0.47)	ND (0.095)	49
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1

Refer to footnotes at end of table.

Table B-1 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
November 1996
(On- and Off-Site Laboratories)

Note: Values in **bold** exceed background concentrations or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
AOB8 = SWMU 8 Area of Open Burning.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J () = Analyte concentration is less than quantitation limit but greater than or equal to the MDL, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected at or above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
SR = Soil sample replicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table B-2
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Gamma Spectroscopy Analytical Results
November 1996
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-238		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
6040	AOB8-GR-021-0-SS	Soil	11-21-96	0–1.0	**17.5**	6.06	0.710	0.355
6041	AOB8-GR-021-0-SR	Soil	11-21-96	0–1.0	**14.1**	4.59	0.747	0.369
6040	AOB8-GR-022-0-SS	Soil	11-21-96	0–1.0	**ND (3.47)**	--	0.778	0.417
6040	AOB8-GR-023-0-SS	Soil	11-21-96	0–1.0	**ND (3.68)**	--	0.567	0.293
6040	AOB8-GR-024-0-SS	Soil	11-21-96	0–1.0	**ND (2.93)**	--	0.557	0.273
6041	AOB8-GR-024-0-SR	Soil	11-21-96	0–1.0	**ND (2.84)**	--	0.496	0.248
6040	AOB8-GR-025-0-SS	Soil	11-21-96	0–1.0	1.30	1.53	0.628	0.305
6040	AOB8-GR-026-0-SS	Soil	11-21-96	0–1.0	**ND (3.94)**	--	0.706	0.355
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	2.31	NA	1.03	NA

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Cesium-137	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
6040	AOB8-GR-021-0-SS	Soil	11-21-96	0–1.0	**0.299**	0.157	0.290	0.0592
6041	AOB8-GR-021-0-SR	Soil	11-21-96	0–1.0	0.150	0.105	0.252	0.0818
6040	AOB8-GR-022-0-SS	Soil	11-21-96	0–1.0	0.0736	0. 631	0.265	0.0551
6040	AOB8-GR-023-0-SS	Soil	11-21-96	0–1.0	ND (0.259)	--	0.481	0.0943
6040	AOB8-GR-024-0-SS	Soil	11-21-96	0–1.0	ND (0.199)	--	0.205	0.0462
6041	AOB8-GR-024-0-SR	Soil	11-21-96	0–1.0	ND (0.195)	--	0.196	0.0481
6040	AOB8-GR-025-0-SS	Soil	11-21-96	0–1.0	ND (0.199)	--	0.163	0.0411
6040	AOB8-GR-026-0-SS	Soil	11-21-96	0–1.0	ND (0.262)	--	0.361	0.0723
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	0.16	NA	1.55	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Thorium-232 and uranium-238 decay chain isotopes with short half-lives are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the MDA.
[d]Dinwiddie September 1997.

Table B-2 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Gamma Spectroscopy Analytical Results
November 1996
(On-Site Laboratory)

AOB8	= SWMU 8 Area of Open Burning.
ft	= Foot (feet).
ER	= Environmental Restoration.
GR	= Grab sample.
ID	= Identification.
MDA	= Minimum detectable activity.
NA	= Not applicable.
ND ( )	= Not detected above the MDA, shown in parentheses.
pCi/g	= Picocurie(s) per gram.
SR	= Soil sample replicate.
SS	= Surface soil sample.
SWMU	= Solid Waste Management Unit.
--	= Error not calculated for nondetect results.

Table B-3
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
HE Compound Analytical MDLs
November 1996
(On- and Off-Site Laboratories)

Analyte	Off-Site Laboratory MDL (EPA Method 8330[a]) (μg/kg)	On-Site Laboratory MDL (EPA Method 8330[a]) (μg/kg)
2,4-Dinitrotoluene	0.16	0.12
2,6-Dinitrotoluene	0.19	0.12
2-amino-4,6-Dinitrotoluene	0.13	NA
4-amino-2,6-Dinitrotoluene	0.055	NA
m-Dintrobenzene	0.1	NA
HMX	0.42	0.15
Nitrobenzene	0.15	NA
m-Nitrotoluene	0.16	0.1
o-Nitrotoluene	0.07	0.09
p-Nitrotoluene	0.17	0.1
PETN	NA	0.7
RDX	0.19	0.11
Tetryl	0.34	NA
sym-Trinitrobenzene	0.07	NA
2,4,6-Trinitrotoluene	0.11	0.12

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
NA = Not analyzed.
PETN = 2,2-Bis [(Nitroxy) Methyl]-1,3-Propanediol, Dinitrate.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
Tetryl = Methyl-2,4,6-trinitrophenylnitramine.

Table B-4
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
Metals Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010, 7000, and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
06014	DPY8-GR-001-0-SS*	Soil	11-19-96	0–1.0	0.84 J (1.4)	48	0.27 J (0.76)	ND (0.54)	10	**25**
06014	DPY8-GR-001-0-SD*	Soil	11-19-96	0–1.0	0.69 J (1.4)	34	0.23 J (0.76)	ND (0.54)	7.8	**38**
06011	DPY8-GR-002-0-SR	Soil	11-18-96	0–1.0	1.95	114	0.374 J (0.495)	0.475 J (0.495)	16.1	**155 J**
05232	DPY8-GR-002-0-SS	Soil	1-06-98	0–1.0	1.95	86.3	0.353 J (0.490)	0.176 J (0.490)	12.0	**89.2 J**
05998	DPY8-GR-003-0-SS*	Soil	11-18-96	0–1.0	0.94 J (1.4)	71	0.35 J (0.76)	ND (0.54)	11	**68**
06011	DPY8-GR-004-0-SR	Soil	11-18-96	0–1.0	1.52	53.2	0.269 J (0.500)	0.223 J (0.500)	6.46	**99.4 J**
05232	DPY8-GR-004-0-SS	Soil	01-06-98	0–1.0	1.72	72.7	0.310 J (0.481)	0.297 J (0.481)	7.69	**212 J**
05998	DPY8-GR-005-0-SS*	Soil	11-18-96	0–1.0	1 J (1.4)	51	0.3 J (0.76)	ND (0.54)	9.3	**77**
06011	DPY8-GR-006-0-SR	Soil	11-18-96	0–1.0	1.86	219	0.297 J (0.467)	0.398 J (0.467)	**67.4**	**1,680 J**
05232	DPY8-GR-007-0-SS	Soil	01-06-98	0–1.0	1.33	60.7	0.274 J (0.485)	0.211 J (0.485)	10.8	**296 J**
05232	DPY8-GR-008-0-SS	Soil	01-06-98	0–1.0	1.87	181	0.297 J (0.500)	**1.00**	**21.0**	**272 J**
510125	DPY8-GR-009-0-SS	Soil	01-06-98	0–1.0	1.59	54.9	0.239 J (0.500)	0.263 J (0.500)	8.23	**40.7**
05998	DPY8-GR-010-0-SS*	Soil	11-18-96	0–1.0	1.5	**250**	0.38 J (0.76)	ND (0.54)	**41**	**390**
05998	DPY8-GR-011-0-SS*	Soil	11-19-96	0–1.0	1.8	**270**	0.54 J (0.76)	ND (0.54)	**33**	**66**
05998	DPY8-GR-012-0-SS*	Soil	11-19-96	0–1.0	1.7	170	0.42 J (0.76)	**0.98 J (2.1)**	**23**	**78**
05998	DPY8-GR-013-0-SS*	Soil	11-19-96	0–1.0	8.9	**620**	**1.7**	ND (0.54)	**87**	**240**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
Metals Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010, 7000, and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
06014	DPY8-GR-014-0-SS*	Soil	11-19-96	0–1.0	1.1 J (1.4)	130	0.27 J (0.76)	ND (0.54)	**38**	**57**
05232	DPY8-GR-015-0-SS	Soil	01-06-98	0–1.0	1.66	160	0.305 J (0.459)	**1.18**	17.8	**52.7 J**
05998	DPY8-GR-016-0-SS*	Soil	11-19-96	0–1.0	1 J (1.4)	190	0.26 J (0.76)	ND (0.54)	**47**	**120**
05998	DPY8-GR-017-0-SS*	Soil	11-19-96	0–1.0	1.6	140	0.37 J (0.76)	ND (0.54)	**26**	**440**
05232	DPY8-GR-018-0-SS	Soil	01-06-98	0–1.0	1.88	214	0.328 J (0.459)	**1.60**	**197**	**49 J**
05998	DPY8-GR-019-0-SS*	Soil	11-19-96	0–1.0	0.98 J (1.4)	82	0.28 J (0.76)	ND (0.54)	12	**65**
05998	DPY8-GR-020-0-SS*	Soil	11-19-96	0–1.0	0.69 J (1.4)	48	0.25 J (0.76)	ND (0.54)	8.5	**30**
05232	DPY8-GR-002-0-SSD	Soil	01-06-98	0–1.0	1.81	81.9	0.315 J (0.485)	0.346 J (0.485)	11.2	**1,840 J**
06011	DPY8-GR-002-0-SD	Soil	11-18-96	0–1.0	2.53	109	0.392 J (0.476)	0.542	15.5	**362 J**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
05232	DPY8-GR-019-FB	Water	01-06-98	NA	ND (0.00293)	ND (0.000332)	ND (0.000223)	ND (0.000208)	ND (0.000729)	ND (0.00132)
06011	AOC8-GR-030-FB	Water	11-19-96	NA	ND (0.38)	ND (3.2)	ND (0.2)	ND (0.54)	ND (0.37)	17
06011	AOC8-GR-030-EB	Water	11-19-96	NA	ND (0.38)	ND (3.2)	ND (0.2)	ND (0.54)	ND (0.37)	ND (4.1)

Refer to footnotes at end of table.

Table B-4 (Continued)
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
Metals Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010, 7000, and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
06014	DPY8-GR-001-0-SS*	Soil	11-19-96	0–1.0	14	ND (0.078)	7.6	ND (0.47)	ND (0.095)	26 J (32)
06014	DPY8-GR-001-0-SD*	Soil	11-19-96	0–1.0	**46**	ND (0.078)	6.9 J (7.3)	ND (0.47)	ND (0.095)	25 J (32)
06011	DPY8-GR-002-0-SR	Soil	11-18-96	0–1.0	**81.1**	ND (0.02)	15.4	0.305 J (0.495)	0.298 J (0.990)	**54.1**
05232	DPY8-GR-002-0-SS	Soil	01-06-98	0–1.0	**49.0**	0.0295 J (0.0304)	10.5	0.309 J (0.490)	0.253 J (0.490)	45.5 J
05998	DPY8-GR-003-0-SS*	Soil	11-18-96	0–1.0	16	**0.32**	10	ND (0.47)	**0.66**	**83**
06011	DPY8-GR-004-0-SR	Soil	11-18-96	0–1.0	17.0	0.0316	6.90	ND (0.114)	0.375 J (1.00)	47.9
05232	DPY8-GR-004-0-SS	Soil	01-06-98	0–1.0	**74.2**	0.0383	8.14	ND (0.07)	**1.84 J**	**90.3 J**
05998	DPY8-GR-005-0-SS*	Soil	11-18-96	0–1.0	16	ND (0.078)	8.4	ND (0.47)	ND (0.095)	41
06011	DPY8-GR-006-0-SR	Soil	11-18-96	0–1.0	**97.6**	ND (0.02)	**21.3**	ND (0.114)	0.152 J (0.935)	**63.2**
05232	DPY8-GR-007-0-SS	Soil	01-06-98	0–1.0	9.40	0.0261 J (0.0318)	7.63	0.154 J (0.485)	0.160 J (0.485)	34.4 J
05232	DPY8-GR-008-0-SS	Soil	01-06-98	0–1.0	**23.5**	0.0328 J (0.0332)	**27.1**	ND (0.07)	**0.754 J**	47.4 J
510125	DPY8-GR-009-0-SS	Soil	01-06-98	0–1.0	13.5	0.0283 J (0.0304)	8.76	ND (0.07)	**1.27**	**119**
05998	DPY8-GR-010-0-SS*	Soil	11-18-96	0–1.0	**110**	**0.099 J (0.3)**	**54**	ND (0.47)	0.14 J (0.36)	**73**
05998	DPY8-GR-011-0-SS*	Soil	11-19-96	0–1.0	**100**	**0.091 J (0.3)**	**38**	2.6	ND (0.095)	**120**
05998	DPY8-GR-012-0-SS*	Soil	11-19-96	0–1.0	**38**	ND (0.078)	**20**	ND (0.47)	0.3 J (0.36)	**64**
05998	DPY8-GR-013-0-SS*	Soil	11-19-96	0–1.0	**79**	**0.28 J (0.3)**	**80**	**4.9**	ND (0.095)	**260**
06014	DPY8-GR-014-0-SS*	Soil	11-19-96	0–1.0	**49**	ND (0.078)	**86**	ND (0.47)	0.1 J (0.36)	**58**
05232	DPY8-GR-015-0-SS	Soil	01-06-98	0–1.0	**19.9**	0.0181 J (0.0321)	**21.4**	**44.2**	ND (0.07 J)	44.2 J
05998	DPY8-GR-016-0-SS*	Soil	11-19-96	0–1.0	**25**	ND (0.078)	**57**	ND (0.47)	ND (0.095)	41
05998	DPY8-GR-017-0-SS*	Soil	11-19-96	0–1.0	18	ND (0.078)	**26**	ND (0.47)	ND (0.095)	35
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1

Refer to footnotes at end of table.

Table B-4 (Concluded)
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
Metals Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010, 7000, and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
05232	DPY8-GR-018-0-SS	Soil	01-06-98	0–1.0	**29.9**	0.0348	**886**	ND (0.07)	**0.845 J**	46.3 J
05998	DPY8-GR-019-0-SS*	Soil	11-19-96	0–1.0	**55**	**1.5**	11	ND (0.47)	ND (0.095)	**54**
05998	DPY8-GR-020-0-SS*	Soil	11-19-96	0–1.0	15	**ND (0.078)**	7.2 J (7.3)	ND (0.47)	ND (0.095)	32
05232	DPY8-GR-002-0-SSD	Soil	01-06-98	0–1.0	**236**	0.0351	10.1	ND (0.07)	0.446 J (0.485)	**73.3 J**
06011	DPY8-GR-002-0-SD	Soil	11-18-96	0–1.0	**76.1**	0.0406	15.0	ND (0.114)	**4.56 J**	**66.2**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)										
05232	DPY8-GR-019-FB	Water	01-06-98	NA	ND (0.000678)	0.000142 J (0.000200)	ND (0.00227)	ND (0.0014)	ND (0.00062)	0.00249 J (0.000966)
06011	AOC8-GR-030-FB	Water	11-19-96	NA	ND (0.83)	ND (0.078)	ND (1.9)	ND (0.47)	ND (0.095)	ND (8.4)
06011	AOC8-GR-030-EB	Water	11-19-96	NA	ND (0.83)	ND (0.078)	ND (1.9)	ND (0.47)	ND (0.095)	ND (8.4)

Note: Values in **bold** exceed background concentrations, or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
*screening level data.

AOC = Area of Concern.
DPY8 = SWMU 8 Debris Pile Feature Y.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected at or above the MDL shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SD = Soil Duplicate.
SR = Surface soil replicate.
SS = Surface soil sample.
SSD = Surface soil duplicate.
SWMU = Solid Waste Management Unit.

Table B-5
Summary of SWMU 58, Feature 58B, RFI Soil Sampling
Metals Analytical Results
April 1996 and November 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
510044	58B-GR-001-0.5-SS	Soil	11-06-97	0–0.5	2.12	82.6	0.386 J (0.463)	ND (0.0104)	13.3	**89.7**
510044	58B-GR-001-0.5-SSD	Soil	11-06-97	0–0.5	1.87	65.5	0.329 J (0.490)	ND (0.0104)	10.8	**111**
510044	58B-GR-002-0.5-SS	Soil	11-06-97	0–0.5	2.04	65.4	0.347 J (0.485)	ND (0.0104)	11.2	**161**
05162	58B-GR-003-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	220	**1.2**	**ND (2.1)**	**20**	**150**
05162	58B-GR-004-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	210	**1**	**ND (2.1)**	**12 J (19)**	**32 J (76)**
05161	58B-GR-004-.5'-SS	Soil	04-30-96	0–0.5	2.57	121	0.437 J (0.495)	0.231 J (0.495)	14.1	**114**
05162	58B-GR-005-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	220	**1**	**ND (2.1)**	ND (5)	**27 J (76)**
05162	58B-GR-006-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	210	**1**	**ND (2.1)**	7.4 J	**45 J (76)**
05162	58B-GR-007-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	220	**1.1**	**ND (2.1)**	**9.7 J (19)**	**36 J (76)**
05162	58B-GR-008-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	240	**1.1**	**ND (2.1)**	**10 J (19)**	**660**
05161	58B-GR-008-.5'-SS	Soil	04-30-96	0–0.5	2.03	129	0.357 J (0.495)	0.309 J (0.495)	**21.9**	**173**
05162	58B-GR-009-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	210	**0.98**	**ND (2.1)**	**9.3 J (19)**	**850**
510044	58B-GR-010-0.5-SS	Soil	11-06-97	0–0.5	2.48	131	0.425 J (0.500)	ND (0.0104)	17.1	**29.9**
510044	58B-GR-011-0.5-SS	Soil	11-06-97	0–0.5	2.97	92.4	0.385 J (0.500)	**0.829**	16.9	**512**
510044	58B-GR-012-0.5-SS	Soil	11-06-97	0–0.5	4.4	162	0.321 J (0.500)	**0.856**	**20.7**	**21,700**
05161	58B-GR-012-.5'-SS	Soil	04-30-96	0–0.5	3.89	**280**	0.473 J (0.495)	**29.5**	**19.9**	**1,120**
05162	58B-GR-013-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	240	**1.1**	**ND (2.1)**	ND (5)	**39 J (76)**
05162	58B-GR-014-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	220	**0.85**	**ND (2.1)**	ND (5)	**1,300 J (76)**
510044	58-GR-015-0.5-SS	Soil	11-06-97	0–0.5	1.62	59.2	0.279 J (0.490)	ND (0.0104)	7.54	**20**
05162	58B-GR-016-.5'-SS	Soil	04-30-96	0–0.5	**ND (26)**	200	**1**	**ND (2.1)**	**8.7 J (19)**	**58 J (76)**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Refer to footnotes at end of table.

Table B-5 (Continued)
Summary of SWMU 58, Feature 58B, RFI Soil Sampling
Metals Analytical Results
April 1996 and November 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
05161	58B-GR-016-.5'-SS	Soil	04-30-96	0–0.5	2.07	82.5	0.336 J (0.495)	ND (0.00960)	12.8	**42**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1
Quality Assurance/Quality Control Samples (mg/L)										
05161	58B-GR-B-EB	Water	04-30-96	NA	ND (0.00186)	0.00119 J (0.01)	ND (0.0000114)	ND (0.0000970)	ND (0.000596)	0.0108
05161	58B-GR-B-FB	Water	04-30-96	NA	ND (0.00186)	0.000804 J (0.01)	ND (0.0000114)	ND (0.0000970)	ND (0.000596)	0.00126 J (0.01)
510044	58B-GR-017-FB	Water	01-06-97	NA	ND (0.00293)	ND (0.000332)	ND (0.000223)	ND (0.000208)	ND (0.000729)	ND (0.00132)
510044	58B-GR-018-EB	Water	01-06-97	NA	ND (0.00293)	ND (0.000332)	ND (0.000223)	ND (0.000208)	ND (0.000729)	ND (0.00132)

Refer to footnotes at end of table.

Table B-5 (Continued)
Summary of SWMU 58, Feature 58B, RFI Soil Sampling
Metals Analytical Results
April 1996 and November 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
510044	58B-GR-001-0.5-SS	Soil	11-06-97	0–0.5	**19.2**	0.0458	9.37	ND (0.07)	0.247 J (0.463)	**54.8**
510044	58B-GR-001-0.5-SSD	Soil	11-06-97	0–0.5	**20.1**	0.0347	8.32	ND (0.07)	0.354 J (0.490)	49.3
510044	58B-GR-002-0.5-SS	Soil	11-06-97	0–0.5	**26.4**	ND (0.0173)	9.92	0.217 J (0.485)	0.225 J (0.485)	51.6
05162	58B-GR-003-.5'-SS	Soil	04-30-96	0–0.5	16	**0.2 J (0.24)**	14 J (15)	**ND (50)**	**ND (1.7)**	43
05162	58B-GR-004-.5'-SS	Soil	04-30-96	0–0.5	12 J (13)	ND (0.06)	**17**	**ND (50)**	**ND (1.7)**	38
05161	58B-GR-004-.5'-SS	Soil	04-30-96	0–0.5	**82.2**	0.0252 J (0.0288)	12.2	ND (0.142)	**1.14**	**64.8**
05162	58B-GR-005-.5'-SS	Soil	04-30-96	0–0.5	ND (3.4)	ND (0.06)	16	**ND (50)**	**ND (1.7)**	34 J (38)
05162	58B-GR-006-.5'-SS	Soil	04-30-96	0–0.5	**45**	**0.17 J (0.24)**	12 J (15)	**ND (50)**	**ND (1.7)**	48
05162	58B-GR-007-.5'-SS	Soil	04-30-96	0–0.5	12 J (13)	**0.074 J (0.24)**	15	**ND (50)**	**ND (1.7)**	49
05162	58B-GR-008-.5'-SS	Soil	04-30-96	0–0.5	**56**	**0.53**	**19**	**ND (50)**	**ND (1.7)**	**65**
05161	58B-GR-008-.5'-SS	Soil	04-30-96	0–0.5	**70.1**	**0.388**	13.7	ND (0.142)	**1.23**	**78B**
05162	58B-GR-009-.5'-SS	Soil	04-30-96	0–0.5	**39**	ND (0.06)	15	**ND (50)**	**ND (1.7)**	44
510044	58B-GR-010-0.5-SS	Soil	11-06-97	0–0.5	**30.6**	0.0189 J (0.0318)	13.6	ND (0.07)	**0.221 J (0.500)**	47.9
510044	58B-GR-011-0.5-SS	Soil	11-06-97	0–0.5	**45.9**	0.0436	13.6	ND (0.07)	**3.6**	**103**
510044	58B-GR-012-0.5-SS	Soil	11-06-97	0–0.5	**256**	**0.0744**	**23.8**	0.197 J (0.485)	**7.64**	**655**
05161	58B-GR-012-.5'-SS	Soil	04-30-96	0–0.5	**510**	**0.142**	**18.2**	2.17	**10.4**	**1,680**
05162	58B-GR-013-.5'-SS	Soil	04-30-96	0–0.5	7.6 J (13)	**1.9**	11 J (15)	**ND (50)**	**ND (1.7)**	35 J (38)
05162	58B-GR-014-.5'-SS	Soil	04-30-96	0–0.5	**150**	**0.14 J (0.24)**	14 J (15)	**ND (50)**	**ND (1.7)**	**54**
510044	58-GR-015-0.5-SS	Soil	11-06-97	0–0.5	6.93	0.018 J (0.0319)	6.86	0.148 J (0.490)	**0.510**	29.9
05162	58B-GR-016-.5'-SS	Soil	04-30-96	0–0.5	16	ND (0.06)	15	**ND (50)**	**ND (1.7)**	38
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1

Refer to footnotes at end of table.

Table B-5 (Concluded)
Summary of SWMU 58, Feature 58B, RFI Soil Sampling
Metals Analytical Results
April 1996 and November 1997
(On- and Off-Site Laboratories)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
05161	58B-GR-016-.5'-SS	Soil	04-30-96	0–0.5	16.1	0.0139 J (0.0276)	10.6	ND (0.142)	**0.378 J (0.99)**	40.7
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.5	52.1
Quality Assurance/Quality Control Samples (mg/L)										
05161	58B-GR-B-EB	Water	04-30-96	NA	ND (0.00113)	ND (0.0000148)	ND (0.000807)	ND (0.00143)	ND (0.00249)	0.0136 J (0.02)
05161	58B-GR-B-FB	Water	04-30-96	NA	0.0127	ND (0.0000148)	ND (0.000807)	ND (0.00143)	ND (0.00249)	ND (0.00270)
510044	58B-GR-017-FB	Water	11-06-97	NA	ND (0.000678)	ND (0.000104)	ND (0.00227)	ND (0.0014)	ND (0.00062)	.00274 J
510044	58B-GR-018-EB	Water	11-06-97	NA	ND (0.000678)	ND (0.000104)	ND (0.00227)	.00146 J	ND (0.00062)	0.0149

Note: Values in **bold** exceed background concentrations, or have MDLs that exceed background concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Soil sample.
SWMU = Solid Waste Management Unit.

Table B-6
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
Gamma Spectroscopy Analytical Results
November 1996
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)							
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Uranium-238		Thorium-232		Uranium-235		Cesium-137	
					Result	Error[c]	Result	Error[c]	Result	Error	Result	Error[c]
06013	DPY8-GR-001-0-SS	Soil	11-19-96	0–1.0	0.653	0.600	0.635	0.339	ND (0.158)	--	ND (0.0329)	--
06013	DPY8-GR-009-0-SS	Soil	11-18-96	0–1.0	ND (1.23)	--	0.622	0.336	**ND (0167)**	--	0.124	0.0353
06013	DPY8-GR-014-0-SS	Soil	11-19-96	0–1.0	ND (1.26)	--	0.688	0.340	**ND (0.180)**	--	0.04.81	0.0232
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	2.31	NA	1.03	NA	0.16	NA	1.55	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.

[a]Thorium-232 and uranium-238 decay chain isotopes with short half-lives are not presented in this table.

[b]Analysis request/chain-of-custody record.

[c]Two standard deviations about the mean detected activity.

[d]Dinwiddie September 1997.

DPY8 = SWMU 8 Debris Pile Feature Y.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table B-7
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
HE Compound Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					High Explosives Residue (EPA Method 8330[a]) (μg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	2,4,6-Trinitrotoluene	2-amino-4,6-dinitrotoluene	4-amino-2,6-dinitrotoluene	HMX
06014	DPY8-GR-001-0-SD	Soil	11-19-96	0–0.5	ND (120)	ND (120)	ND (120)	ND (150)
06014	DPY8-GR-001-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND 120)	ND(120)	ND (150)
05998	DPY8-GR-002-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
06011	DPY8-GR-002-0-SR	Soil	11-18-96	0–1.0	**372**	ND (6.6)	ND (5.45 J)	ND (5.27 J)
05998	DPY8-GR-003-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-004-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
06011	DPY8-GR-004-0-SR	Soil	11-18-96	0–1.0	ND (5.67)	ND (6.6)	ND (5.45 J)	ND (5.27 J)
05998	DPY8-GR-005-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-006-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
06011	DPY8-GR-006-0-SR	Soil	11-18-96	0–1.0	ND (5.67)	ND (6.6)	ND (5.45 J)	**2,670 J**
05998	DPY8-GR-007-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	**730 J (800)**
05998	DPY8-GR-008-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
06014	DPY8-GR-009-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-010-0-SS	Soil	11-18-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-011-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-012-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-013-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
06014	DPY8-GR-014-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-015-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-016-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-017-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-018-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-019-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
05998	DPY8-GR-020-0-SS	Soil	11-19-96	0–1.0	ND (120)	ND (120)	ND (120)	ND (150)
06011	DPY8-GR-002-0-SD	Soil	11-18-96	0–1.0	**7,940**	**175 J (188)**	**247 J**	**916 J**
05232	DPY8-GR-002-0-SS	Soil	01-06-98	0–0.5	ND (5.67)	ND (6.6)	ND (5.45)	**120 J**
05232	DPY8-GR-004-0-SS	Soil	01-06-98	0–0.5	ND (5.67)	ND (6.6)	ND (5.45)	**16,000 J**
05232	DPY8-GR-007-0-SS	Soil	01-06-98	0–0.5	ND (5.67)	ND (6.6)	ND (5.45)	**2,700 J**
05232	DPY8-GR-008-0-SS	Soil	01-06-98	0–0.5	**140**	**94**	**75 J (80.0)**	**82 J**
510125	DPY8-GR-009-0-SS	Soil	01-06-98	0–0.5	ND (5.67)	ND (6.6)	ND (5.45)	**42 J (80.0)**
05232	DPY8-GR-015-0-SS	Soil	01-06-98	0–0.5	ND (5.67)	ND (6.6)	ND (5.45)	**650 J**
05232	DPY8-GR-018-0-SS	Soil	01-06-98	0–0.5	**35 J (80.0)**	ND (6.6)	ND (5.45)	ND (5.27 J)
05232	DPY8-GR-002-SSD	Soil	01-06-98	0–0.5	ND (5.67)	ND (6.6)	ND (5.45)	**2,600 J**

Refer to footnotes at end of table.

Table B-7 (Concluded)
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
HE Compound Analytical Results
November 1996 and January 1998
(On- and Off-Site Laboratories)

Sample Attributes					High Explosives Residue (EPA Method 8330[a]) (μg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	2,4,6-Trinitrotoluene	2-amino-4,6-dinitrotoluene	4-amino-2,6-dinitrotoluene	HMX
Quality Assurance/Quality Control Samples (μg/L)								
05998	AOC8-GR-030-FB	Water	11-19-96	NA	ND (14)	ND (14)	ND (14)	ND (18)
06011	AOC8-GR-030-FB	Water	11-19-96	NA	ND (0.0293 J)	ND (0.0186 J)	ND (0.0195 J)	ND (0.0459)
06011	AOC8-GR-030-EB	Water	11-19-96	NA	ND (0.0293 J)	ND (0.0186 J)	ND (0.0195 J)	ND (0.0459)
05998	AOC8-GR-030-EB	Water	11-19-96	NA	ND (14)	ND (14)	ND (14)	ND (18)
05232	DPY8-GR-019-FB	Water	01-06-98	NA	ND (0.0293)	ND (0.0186)	ND (0.0195)	ND (0.0459)
05232	DPY8-GR-020-EB	Water	01-06-98	NA	ND (0.0293)	ND (0.0186)	ND (0.0195)	ND (0.0459)

Note: Values in **bold** represent detected analytes.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

AOC = Area of Concern.
DPY8 = SWMU 8 Feature Y.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
J = Estimated concentration.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SD = Soil duplicate.
SR = Surface soil replicate.
SS = Soil sample.
SSD = Surface soil duplicate.
SWMU = Solid Waste Management Unit.

Table B-8
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
HE Compound Analytical MDLs
November 1996 and January 1998
(On- and Off-Site Laboratories)

Analyte	MDL (EPA Method 8330[a,b]) (μg/kg)
2,4-Dinitrotoluene	6.18 (120)
2,6-Dinitrotoluene	6.48 (120)
2-amino-4,6-Dinitrotoluene	6.6
4-amino-2,6-Dinitrotoluene	5.45
m-Dintrobenzene	4.05
HMX	5.27 (150)
Nitrobenzene	5.21
m-Nitrotoluene	11.1 (100)
o-Nitrotoluene	7.83 (90)
p-Nitrotoluene	10.6 (100)
1,2,3-Propanetriol Trinitrate	(70)
RDX	9.71 (110)
Tetryl	7.55
sym-Trinitrobenzene	6.62
2,4,6-Trinitrotoluene	5.67 (120)

Note: The numbers in parentheses are 1996 on-site laboratory sampling event screening level detection limits.
[a]EPA November 1986.
[b]COCs 510125, 05232, 06014, 5998, and 06011.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RFI = RCRA Facility Investigation.
SWMU = Solid Waste Management Unit.
Tetryl = Methyl-2,4,6-trinitrophenylnitramine.

Table B-9
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
HE Compound Analytical Results
July 1998
(Off-Site Laboratory)

Sample Attributes					High Explosives Residue (EPA Method 8330[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	HMX	2,4,6-Trinitrotoluene
600710	8Y/58B-GR-090-0.0-SS	Soil	07-31-98	0–0.5	ND (5.3)	ND (5.7)
600710	8Y/58B-GR-091-0.0-SS	Soil	07-31-98	0–0.5	3,600	720
600710	8Y/58B-GR-092-0.0-SS	Soil	07-31-98	0–0.5	3,300	ND (5.7)
600710	8Y/58B-GR-093-0.0-SS	Soil	07-31-98	0–0.5	420	960
600710	8Y/58B-GR-094-0.0-SS	Soil	07-31-98	0–0.5	1,200	ND (5.7)
600710	8Y/58B-GR-095-0.0-SS	Soil	07-31-98	0–0.5	ND (5.3)	ND (5.7)
600710	8Y/58B-GR-096-0.0-SS	Soil	07-31-98	0–0.5	ND (5.3)	ND (5.7)
600710	8Y/58B-GR-097-0.0-SS	Soil	07-31-98	0–0.5	ND (5.3)	ND (5.7)
600710	8Y/58B-GR-098-0.0-SS	Soil	07-31-98	0–0.5	ND (5.3)	ND (5.7)
600710	8Y/58B-GR-099-0.0-SS	Soil	07-31-98	0–0.5	ND (5.3)	ND (5.7)

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
8Y/58B = SWMUs 8Y and 58B.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
ID = Identification.
MDL = Method detection limit.
μg/kg = Milligram(s) per kilogram.
ND ( ) = Note detected above the MDL, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table B-10
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
Tritium Analytical Results
July 1998
(Off-Site Laboratory)

Sample Attributes					Tritium (EPA Method 906.0[a]) (pCi/L)	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Tritium	Accuracy +/-
600710	8Y/58B-GR-090-0.0-SS	Soil	07-31-98	0–0.5	187	178
600710	8Y/58B-GR-091-0.0-SS	Soil	07-31-98	0–0.5	654	195
600710	8Y/58B-GR-092-0.0-SS	Soil	07-31-98	0–0.5	949	203
600710	8Y/58B-GR-093-0.0-SS	Soil	07-31-98	0–0.5	853	202
600710	8Y/58B-GR-094-0.0-SS	Soil	07-31-98	0–0.5	281	175
600710	8Y/58B-GR-095-0.0-SS	Soil	07-31-98	0–0.5	ND (150)	175
600710	8Y/58B-GR-096-0.0-SS	Soil	07-31-98	0–0.5	ND (151)	169
600710	8Y/58B-GR-097-0.0-SS	Soil	07-31-98	0–0.5	ND (152)	176
600710	8Y/58B-GR-098-0.0-SS	Soil	07-31-98	0–0.5	221	181
600710	8Y/58B-GR-099-0.0-SS	Soil	07-31-98	0–0.5	ND (157)	185

[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
8Y/58B = SWMUs 8Y and 58B.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
ND ( ) = Note detected above the MDA, shown in parentheses.
pCi/L = Picocurie(s) per liter.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table B-11
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
Gamma Spectroscopy Analytical Results
July 1998
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Cs-137	Error[c]	Th-232	Error[c]
600712	8Y/58B-GR-090-0.0-SS	Soil	07-31-98	0.0–0.5	0.244	0.112	0.602	0.360
600711	8Y/58B-GR-091-0.0-SS	Soil	07-31-98	0.0–0.5	0.105	0.0293	0.610	0.297
600711	8Y/58B-GR-092-0.0-SS	Soil	07-31-98	0.0–0.5	0.148	0.0411	0.580	0.285
600711	8Y/58B-GR-093-0.0-SS	Soil	07-31-98	0.0–0.5	0.331	0.130	0.690	0.334
600711	8Y/58B-GR-094-0.0-SS	Soil	07-31-98	0.0–0.5	0.117	0.0366	0.594	0.305
600712	8Y/58B-GR-095-0.0-SS	Soil	07-31-98	0.0–0.5	0.142	0.0441	0.721	0.378
600711	8Y/58B-GR-096-0.0-SS	Soil	07-31-98	0.0–0.5	ND (0.0305)	NA	0.706	0.372
600711	8Y/58B-GR-097-0.0-SS	Soil	07-31-98	0.0–0.5	0.0255	0.00716	0.624	0.310
600711	8Y/58B-GR-098-0.0-SS	Soil	07-31-98	0.0–0.5	ND (0.0287)	NA	0.779	0.380
600711	8Y/58B-GR-099-0.0-SS	Soil	07-31-98	0.0–0.5	0.0157	0.0113	0.820	0.413
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	1.55	NA	1.03	NA

Refer to footnotes at end of table.

Table B-11 (Concluded)
Summary of SWMU 8, Feature 8Y, RFI Soil Sampling
Gamma Spectroscopy Analytical Results
July 1998
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	U-235	Error	U-238	Error[c]
600712	8Y/58B-GR-090-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.178)**	NA	**0.949**	0.672
600711	8Y/58B-GR-091-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.188)**	NA	**ND (2.66)**	NA
600711	8Y/58B-GR-092-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.191)**	NA	**ND (2.87)**	NA
600711	8Y/58B-GR-093-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.205)**	NA	**ND (2.97)**	NA
600711	8Y/58B-GR-094-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.189)**	NA	**ND (2.66)**	NA
600712	8Y/58B-GR-095-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.170)**	NA	1.15	0.671
600711	8Y/58B-GR-096-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.208)**	NA	**ND (2.85)**	NA
600711	8Y/58B-GR-097-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.203)**	NA	**ND (2.81)**	NA
600711	8Y/58B-GR-098-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.199)**	NA	**ND (2.87)**	NA
600711	8Y/58B-GR-099-0.0-SS	Soil	07-31-98	0.0–0.5	**ND (0.223)**	NA	**ND (3.28)**	NA
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Uranium-238 and thorium-232 decay chain isotopes with short half lives are not presented in this table.
[b]Analysis Request/Chain of Custody record.
[c]Two standard deviations about the mean detected activity.
[d]Dinwiddie September 1997.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND = Not detected above the MDA, shown in parentheses.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background activity.
pCi/g = Picocurie(s) per gram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SS = Soil sample.
SWMU = Solid Waste Management Unit.

Table B-12
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Verification Soil Sampling
Metals Analytical Results
June 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium
06733	8-GR-006-0-S	Soil	06-19-97	0–0.5	3.55	114	0.519	**6.13**
06733	8-GR-007-0-S	Soil	06-19-97	0–0.5	2.61	96.1	0.387 J (0.472)	**4.81**
06733	8-GR-008-0-S	Soil	06-19-97	0–0.5	2.55	88.2	0.397 J (0.485)	**5.39**
06733	8-GR-009-0-S	Soil	06-19-97	0–0.5	2.5	81.9	0.375 J (0.481)	**0.676**
06733	8-GR-010-0-S	Soil	06-19-97	0–0.5	2.28	70.1	0.304 J (0.463)	**3.16**
06733	8-GR-011-0-S	Soil	06-19-97	0–0.5	2.47	70.4	0.313 J (0.490)	**0.694**
06733	8-GR-014-0-S (duplicate of 8-GR-006-0-SS	Soil	06-19-97	0–0.5	3.31	112	0.507	**4.75**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64
Quality Assurance/Quality Control Samples (mg/L)								
06733	8-GR-012-0-FB	Water	06-19-97	NA	ND (0.00276)	0.000287 J (0.0100)	ND (0.000135)	0.000209 J (0.00500)
06733	8-GR-013-0-EB	Water	06-19-97	NA	ND (0.00276)	0.00115 J (0.0100)	ND (0.000135)	0.000289 J (0.00500)

Refer to footnotes at end of table.

Table B-12 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Verification Soil Sampling
Metals Analytical Results
June 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chromium	Copper	Lead	Mercury
06733	8-GR-006-0-S	Soil	06-19-97	0–0.5	**30.6**	**66**	**368**	ND (0.0167)
06733	8-GR-007-0-S	Soil	06-19-97	0–0.5	14.7	**360**	**29,400**	ND (0.0167)
06733	8-GR-008-0-S	Soil	06-19-97	0–0.5	**19.7**	**926**	**13,100**	0.0202 J (0.0289)
06733	8-GR-009-0-S	Soil	06-19-97	0–0.5	13.1	**322**	**20,600**	ND (0.0167)
06733	8-GR-010-0-S	Soil	06-19-97	0–0.5	13.5	**136**	**1,010**	ND (0.0167)
06733	8-GR-011-0-S	Soil	06-19-97	0–0.5	9.39	**135**	**9,100**	ND (0.0167)
06733	8-GR-014-0-S (duplicate of 8-GR-006-0-SS	Soil	06-19-97	0–0.5	**26.6**	**57.4**	**277**	0.0185 J (0.0317)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.8	17.1	18.9	0.055
Quality Assurance/Quality Control Samples (mg/L)								
06733	8-GR-012-0-FB	Water	06-19-97	NA	0.000645 J (0.0100)	ND (0.00114)	ND (0.00136)	ND (0.0001)
06733	8-GR-013-0-EB	Water	06-19-97	NA	ND (0.000621)	0.00179 J (0.0100)	0.00734	ND (0.0001)

Refer to footnotes at end of table.

Table B-12 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Verification Soil Sampling
Metals Analytical Results
June 1997
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Nickel	Selenium	Silver	Zinc
06733	8-GR-006-0-S	Soil	06-19-97	0–0.5	**46.2**	1.08	0.434 J (0.962)	**1,270**
06733	8-GR-007-0-S	Soil	06-19-97	0–0.5	**134**	**2.82**	**0.865 J (0.943)**	**226**
06733	8-GR-008-0-S	Soil	06-19-97	0–0.5	8.75 J (24.3)	1.86	**0.797 J (0.971)**	**191**
06733	8-GR-009-0-S	Soil	06-19-97	0–0.5	6.82 J (24.0)	2.37	**0.631 J (0.962)**	**73.1**
06733	8-GR-010-0-S	Soil	06-19-97	0–0.5	9.40 J (23.1)	0.63	0.173 J (0.926)	**68.1**
06733	8-GR-011-0-S	Soil	06-19-97	0–0.5	9.64 J (24.5)	1.42	0.364 J (0.980)	**93.7**
06733	8-GR-014-0-S (duplicate of 8-GR-006-0-SS	Soil	06-19-97	0–0.5	**33.6**	0.906	0.245 J (0.943)	**1,090**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	16.6	2.7	<0.50	52.1
Quality Assurance/Quality Control Samples (mg/L)								
06733	8-GR-012-0-FB	Water	06-19-97	NA	0.00155 J (0.0100)	ND (0.00228)	0.000671 J (0.0100)	0.00249 J (0.0200)
06733	8-GR-013-0-EB	Water	06-19-97	NA	ND (0.000996)	ND (0.00228)	0.000508 J (0.0100)	0.00847 J (0.0200)

Note: Values in **bold** exceed background concentrations, or have MDLs that exceed background concentrations.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
FB = Field blank.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected at or above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Soil sample.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

Table B-13
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Soil Sampling
Gamma Spectroscopy Analytical Results
June 1997
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-238		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
06757	8-GR-006-0-S	Soil	06-19-97	0–0.5	**11.0**	3.92	0.894	0.435
06757	8-GR-007-0-S	Soil	06-19-97	0–0.5	1.29	1.19	0.634	0.324
06757	8-GR-008-0-S	Soil	06-19-97	0–0.5	ND (3.09)	--	0.562	0.281
06757	8-GR-009-0-S	Soil	06-19-97	0–0.5	ND (3.07)	--	0.718	0.361
06757	8-GR-010-0-S	Soil	06-19-97	0–0.5	ND (3.13)	--	0.747	0.383
06756	8-GR-011-0-SS	Soil	06-19-97	0–0.5	1.79	1.79	0.733	0.390
06757	8-GR-014-0-SD (duplicate of 8-GR-006-0-SS)	Soil	06-19-97	0–0.5	**11.4**	5.94	0.868	0.454
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	2.31	NA	1.03	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
06757	8-GR-012-0-FB	Water	06-19-97	NA	ND (1.80)	NA	ND (0.157)	NA
06757	8-GR-013-0-EB	Water	06-19-97	NA	ND (1.72)	NA	ND (0.148)	NA
06756	8-GR-015-0-WST	Water	06-19-97	NA	ND (1.75)	NA	ND (0.156)	NA

Refer to footnotes at end of table.

Table B-13 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Soil Sampling
Gamma Spectroscopy Analytical Results
June 1997
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Cesium-137	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
06757	8-GR-006-0-S	Soil	06-19-97	0–0.5	**0.315**	0.263	0.648	0.107
06757	8-GR-007-0-S	Soil	06-19-97	0–0.5	ND (0.223)	--	0.516	0.0903
06757	8-GR-008-0-S	Soil	06-19-97	0–0.5	ND (0.218)	--	0.443	0.0819
06757	8-GR-009-0-S	Soil	06-19-97	0–0.5	ND (0.219)	--	0.298	0.104
06757	8-GR-010-0-S	Soil	06-19-97	0–0.5	ND (0.223)	--	0.261	0.297
06756	8-GR-011-0-SS	Soil	06-19-97	0–0.5	ND (0.215)	--	0.199	0.0465
06757	8-GR-014-0-SD (duplicate of 8-GR-006-0-SS)	Soil	06-19-97	0–0.5	**0.173**	0.209	0.589	0.102
Background Activities—Lower Canyons Area[d]		Soil	NA	NA	0.160	NA	1.55	NA
Quality Assurance/Quality Control Samples (pCi/mL)								
06757	8-GR-012-0-FB	Water	06-19-97	NA	ND (0.151)	NA	ND (0.0230)	NA
06757	8-GR-013-0-EB	Water	06-19-97	NA	ND (0.155)	NA	ND (0.0240)	NA
06756	8-GR-015-0-WST	Water	06-19-97	NA	ND (0.158)	NA	ND (0.0234)	NA

Note: Values in **bold** exceed background activities or have MDAs that exceed background activities.
[a]Thorium-232 and uranium-238 decay chain isotopes with short half-lives are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Dinwiddie September 1997.

EB = Equipment blank.
ER = Environmental Restoration.
FB = Field blank.
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
NA = Not applicable.
ND = Not detected above the MDA, shown in parentheses.
S = Soil sample.
SD = Soil duplicate.
SS = Surface soil sample.
WST = Waste sample.
-- = Error not calculated for nondetect results.

Table B-14
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) VCM Soil Verification Sampling
Metals Analytical Results
August 1998
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010/7000 and 7470/7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium
600775	8-GR-001-0.0-SS	Soil	08-26-98	0–0.5	3.36	148	0.533	0.509	13.0
600775	8-GR-002-0.0-SS	Soil	08-26-98	0–0.5	2.98	124	0.460 J (0.485)	0.309 J (0.485)	11.1
NMED-Approved Background Value—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8

Sample Attributes					Metals (EPA Methods 6010/7000 and 7470/7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver
600775	8-GR-001-0.0-SS	Soil	08-26-98	0–0.5	**139**	0.0146 J (0.0305)	14.3	ND (0.135)	0.171 J (0.490)
600775	8-GR-002-0.0-SS	Soil	08-26-98	0–0.5	**33.8**	0.0197 J (0.0305)	9.87	ND (0.135)	0.149 J (0.485)
NMED-Approved Background Value—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50

Note: Values in **bold** exceed background concentrations, or have MDLs that exceed background concentrations.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Garcia November 1998.

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

Table B-15
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) MACTECH VCM Soil Verification Sampling
Gamma and Alpha Spectroscopy Analytical Results
August 1998
(On- and Off-Site Laboratories)

Sample Attributes					Gamma and Alpha Spectroscopy Activities[a] (pCi/g)			
					Uranium-238		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
600774	8-GR-001-0.0-SS	Soil	08-26-98	0–1.0	**8.67**	0.948	**1.07**	0.436
600773	8-GR-001-0.0-SS[d]	Soil	08-26-98	0–1.0	**10.7**	1.86	0.700	0.384
600774	8-GR-002-0.0-SS	Soil	08-26-98	0–1.0	**2.73**	0.334	0.736	0.245
600773	8-GR-002-0.0-SS[d]	Soil	08-26-98	0–1.0	**4.30**	0.960	0.760	0.371
NMED-Approved Background Activities—Lower Canyons Area[e]		Soil	NA	NA	2.31	NA	1.03	NA

Sample Attributes					Gamma and Alpha Spectroscopy Activities[a] (pCi/g)			
					Uranium-235		Cesium-137	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
600774	8-GR-001-0.0-SS	Soil	08-26-98	0–1.0	**0.180**	0.0548	0.0707	0.0331
600773	8-GR-001-0.0-SS[d]	Soil	08-26-98	0–1.0	**0.307**	0.217	0.0492	0.0195
600774	8-GR-002-0.0-SS	Soil	08-26-98	0–1.0	0.0845	0.0357	0.765	0.0953
600773	8-GR-002-0.0-SS[d]	Soil	08-26-98	0–1.0	0.131	0.196	0.626	0.0988
NMED-Approved Background Activities—Lower Canyons Area[e]		Soil	NA	NA	0.16	NA	1.55	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Thorium-232 and uranium-238 decay chain isotopes with short half-lives are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Analyzed by Gamma Spectroscopy.
[e]Dinwiddie September 1997.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

Table B-16
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium
602121	AOB8-GR-101-0.0-SS	Soil	06-28-99	0–0.5	3.1	120	0.58	0.56
602121	AOB8-GR-102-0.0-SS	Soil	06-28-99	0–0.5	3.1	120	0.62	0.63
602121	AOB8-GR-103-0.0-SS	Soil	06-28-99	0–0.5	2.5	90	0.45	0.32
602121	AOB8-GR-104-0.0-SS	Soil	06-28-99	0–0.5	2.7	100	0.53	0.46
602121	AOB8-GR-105-0.0-SS	Soil	06-28-99	0–0.5	3	120	0.55	0.45
602121	AOB8-GR-106-0.0-SS	Soil	06-28-99	0–0.5	4	220	**0.85**	0.37
602121	AOB8-GR-107-0.0-SS	Soil	06-28-99	0–0.5	2.9	110	0.56	0.44
602121	AOB8-GR-108-0.0-SS	Soil	06-28-99	0–0.5	3.4	150	0.67	0.41
602121	AOB8-GR-109-0.0-SS	Soil	06-28-99	0–0.5	3.2	130	0.64	0.44
602121	AOB8-GR-110-0.0-SS	Soil	06-28-99	0–0.5	3.1	130	0.62	0.44
602121	AOB8-GR-111-0.0-SS	Soil	06-28-99	0–0.5	3.8	120	0.55	0.44
602121	AOB8-GR-112-0.0-SS	Soil	06-28-99	0–0.5	2.9	130	0.59	0.48
602121	AOB8-GR-113-0.0-SS	Soil	06-28-99	0–0.5	2.8	100	0.5	0.55
602121	AOB8-GR-114-0.0-SS	Soil	06-28-99	0–0.5	3	130	0.6	0.62
602121	AOB8-GR-115-0.0-SS	Soil	06-28-99	0–0.5	3.8	170	**0.82**	**2.3**
602121	AOB8-GR-116-0.0-SS	Soil	06-28-99	0–0.5	3	130	0.67	**0.81**
602121	AOB8-GR-117-0.0-SS	Soil	06-28-99	0–0.5	2.7	120	0.67	0.6
602121	AOB8-GR-118-0.0-SS	Soil	06-28-99	0–0.5	2.8	120	0.6	0.55
602121	AOB8-GR-119-0.0-SS	Soil	06-28-99	0–0.5	2.7	110	0.57	**0.85**
602121	AOB8-GR-120-0.0-SS	Soil	06-28-99	0–0.5	2.6	130	0.58	**1.6**
602121	AOB8-GR-231-0.0-SS	Soil	06-28-99	0–0.5	2.7	110	0.67	**0.76**
602122	AOB8-GR-121-0.0-SS	Soil	06-28-99	0–0.5	2.7	110	0.58	**2.4**
602122	AOB8-GR-122-0.0-SS	Soil	06-28-99	0–0.5	7.4	110	0.54	**2.4**
602122	AOB8-GR-123-0.0-SS	Soil	06-28-99	0–0.5	3.1	110	0.6	**2.1**
602122	AOB8-GR-124-0.0-SS	Soil	06-28-99	0–0.5	2.9	140	0.65	0.64
602122	AOB8-GR-125-0.0-SS	Soil	06-28-99	0–0.5	3.1	130	0.68	**0.74**
602122	AOB8-GR-126-0.0-SS	Soil	06-28-99	0–0.5	2.6	100	0.56	0.5
602122	AOB8-GR-127-0.0-SS	Soil	06-28-99	0–0.5	2.7	120	0.56	**1.1**
602122	AOB8-GR-128-0.0-SS	Soil	06-28-99	0–0.5	2.5	96	0.46	**0.79**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium
602122	AOB8-GR-129-0.0-SS	Soil	06-28-99	0–0.5	2.8	110	0.51	**3.1**
602122	AOB8-GR-130-0.0-SS	Soil	06-28-99	0–0.5	2.8	90	0.44	**1.9**
602122	AOB8-GR-131-0.0-SS	Soil	06-28-99	0–0.5	2.9	130	0.62	**1.3**
602122	AOB8-GR-132-0.0-SS	Soil	06-28-99	0–0.5	3	140	0.63	**0.74**
602122	AOB8-GR-133-0.0-SS	Soil	06-29-99	0–0.5	2.9	130	0.61	**0.79**
602122	AOB8-GR-134-0.0-SS	Soil	06-29-99	0–0.5	2.6	110	0.58	**0.76**
602122	AOB8-GR-135-0.0-SS	Soil	06-29-99	0–0.5	3	120	0.59	**1.3**
602122	AOB8-GR-136-0.0-SS	Soil	06-29-99	0–0.5	3.5	85	0.36	**17**
602122	AOB8-GR-137-0.0-SS	Soil	06-29-99	0–0.5	2.5	97	0.47	**1.7**
602122	AOB8-GR-138-0.0-SS	Soil	06-29-99	0–0.5	2.6	100	0.51	**3.9**
602122	AOB8-GR-139-0.0-SS	Soil	06-29-99	0–0.5	3	100	0.55	**690**
602122	AOB8-GR-140-0.0-SS	Soil	06-29-99	0–0.5	3.3	130	0.65	**0.72**
602122	AOB8-GR-232-0.0-SS	Soil	06-29-99	0–0.5	3.8	160	**0.82**	0.51
602123	AOB8-GR-141-0.0-SS	Soil	06-29-99	0–0.5	3.7	140	0.75	**1**
602123	AOB8-GR-142-0.0-SS	Soil	06-29-99	0–0.5	3.3	140	**0.77**	**0.77**
602123	AOB8-GR-143-0.0-SS	Soil	06-29-99	0–0.5	5.4	120	0.57	**2.1**
602123	AOB8-GR-144-0.0-SS	Soil	06-29-99	0–0.5	3.6	130	0.64	0.54
602123	AOB8-GR-145-0.0-SS	Soil	06-29-99	0–0.5	3.6	130	0.65	**1.2**
602123	AOB8-GR-146-0.0-SS	Soil	06-29-99	0–0.5	3.1	110	0.48	**17**
602123	AOB8-GR-147-0.0-SS	Soil	06-29-99	0–0.5	3.6	110	0.59	**8.1**
602123	AOB8-GR-148-0.0-SS	Soil	06-29-99	0–0.5	3.5	180	0.62	**1**
602123	AOB8-GR-149-0.0-SS	Soil	06-29-99	0–0.5	3.8	170	0.74	0.57
602123	AOB8-GR-150-0.0-SS	Soil	06-29-99	0–0.5	2.9	120	0.6	0.47
602123	AOB8-GR-151-0.0-SS	Soil	06-29-99	0–0.5	3.4	140	0.64	**0.85**
602123	AOB8-GR-152-0.0-SS	Soil	06-29-99	0–0.5	4.2	160	**0.76**	0.41
602123	AOB8-GR-153-0.0-SS	Soil	06-29-99	0–0.5	3.5	170	0.68	0.46
602123	AOB8-GR-154-0.0-SS	Soil	06-29-99	0–0.5	3.5	120	0.6	**1.2**
602123	AOB8-GR-155-0.0-SS	Soil	06-29-99	0–0.5	3	160	0.54	0.65
602123	AOB8-GR-156-0.0-SS	Soil	06-29-99	0–0.5	2.8	120	0.6	**0.93**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium
602123	AOB8-GR-157-0.0-SS	Soil	06-29-99	0–0.5	3.3	150	0.66	0.54
602123	AOB8-GR-158-0.0-SS	Soil	06-29-99	0–0.5	3.5	150	0.65	0.52
602123	AOB8-GR-159-0.0-SS	Soil	06-29-99	0–0.5	3.6	180	**0.79**	0.44
602123	AOB8-GR-160-0.0-SS	Soil	06-29-99	0–0.5	2.9	110	0.59	**2.3**
602123	AOB8-GR-233-0.0-SS	Soil	06-29-99	0–0.5	3	120	0.65	**1.7**
602124	AOB8-GR-161-0.0-SS	Soil	06-29-99	0–0.5	3.4	130	0.6	**1.3**
602124	AOB8-GR-162-0.0-SS	Soil	06-29-99	0–0.5	3.2	120	0.61	**0.8**
602124	AOB8-GR-163-0.0-SS	Soil	06-29-99	0–0.5	3.1	120	0.57	**0.8**
602124	AOB8-GR-164-0.0-SS	Soil	06-29-99	0–0.5	3.1	140	**4.5**	0.58
602124	AOB8-GR-165-0.0-SS	Soil	06-30-99	0–0.5	6.5	**1,300**	0.62	**4**
602124	AOB8-GR-166-0.0-SS	Soil	06-30-99	0–0.5	3.5	130	na	**0.78**
602124	AOB8-GR-167-0.0-SS	Soil	06-30-99	0–0.5	3.1	130	0.62	**0.67**
602124	AOB8-GR-168-0.0-SS	Soil	06-30-99	0–0.5	3.1	120	0.58	**0.85**
602124	AOB8-GR-169-0.0-SS	Soil	06-30-99	0–0.5	3	140	0.64	**1.2**
602124	AOB8-GR-170-0.0-SS	Soil	06-30-99	0–0.5	3.1	160	0.62	**3.3**
602124	AOB8-GR-171-0.0-SS	Soil	06-30-99	0–0.5	3.4	140	0.66	**1.2**
602124	AOB8-GR-172-0.0-SS	Soil	06-30-99	0–0.5	2.8	120	0.56	0.32
602124	AOB8-GR-173-0.0-SS	Soil	06-30-99	0–0.5	2.9	120	0.6	**1.2**
602124	AOB8-GR-174-0.0-SS	Soil	06-30-99	0–0.5	3.1	130	0.5	**1.2**
602124	AOB8-GR-175-0.0-SS	Soil	06-30-99	0–0.5	2.8	120	0.56	0.56
602124	AOB8-GR-176-0.0-SS	Soil	06-30-99	0–0.5	3.5	140	0.66	0.5
602124	AOB8-GR-177-0.0-SS	Soil	06-30-99	0–0.5	8.3	120	0.67	0.5
602124	AOB8-GR-178-0.0-SS	Soil	06-30-99	0–0.5	3.3	120	0.58	**1.3**
602124	AOB8-GR-179-0.0-SS	Soil	06-30-99	0–0.5	3.2	130	0.65	**3.8**
602124	AOB8-GR-180-0.0-SS	Soil	06-30-99	0–0.5	3.4	150	0.69	**0.83**
602124	AOB8-GR-234-0.0-SS	Soil	06-30-99	0–0.5	3.2	150	0.74	**0.88**
602126	AOB8-GR-181-0.0-SS	Soil	06-30-99	0–0.5	3.6	170	**0.81**	**0.9**
602126	AOB8-GR-182-0.0-SS	Soil	06-30-99	0–0.5	3.1	130	0.66	0.56
602126	AOB8-GR-183-0.0-SS	Soil	06-30-99	0–0.5	2.8	160	0.64	**1**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium
602126	AOB8-GR-184-0.0-SS	Soil	06-30-99	0–0.5	7.4	130	0.64	**12**
602126	AOB8-GR-185-0.0-SS	Soil	06-30-99	0–0.5	3	130	0.62	0.64
602126	AOB8-GR-186-0.0-SS	Soil	06-30-99	0–0.5	7.6	160	0.75	**0.68**
602126	AOB8-GR-187-0.0-SS	Soil	06-30-99	0–0.5	2.6	110	0.53	0.43
602126	AOB8-GR-188-0.0-SS	Soil	06-30-99	0–0.5	2.4	94	0.45	0.36
602126	AOB8-GR-189-0.0-SS	Soil	06-30-99	0–0.5	3.4	140	0.68	0.42
602126	AOB8-GR-190-0.0-SS	Soil	06-30-99	0–0.5	2.7	130	0.63	0.47
602126	AOB8-GR-191-0.0-SS	Soil	06-30-99	0–0.5	4	180	**0.78**	0.36
602126	AOB8-GR-192-0.0-SS	Soil	06-30-99	0–0.5	3.1	130	0.61	0.42
602126	AOB8-GR-193-0.0-SS	Soil	06-30-99	0–0.5	2.9	120	0.53	0.31
602126	AOB8-GR-194-0.0-SS	Soil	06-30-99	0–0.5	2.7	120	0.6	0.41
602126	AOB8-GR-195-0.0-SS	Soil	06-30-99	0–0.5	2.7	110	0.57	0.34
602126	AOB8-GR-196-0.0-SS	Soil	06-30-99	0–0.5	4	160	**0.76**	0.35
602127	AOB8-GR-221-1.0-SS	Soil	07-01-99	1.0–1.5	3.2	160	0.71	**0.94**
602127	AOB8-GR-222-1.0-SS	Soil	07-01-99	1.0–1.5	3.3	170	**0.76**	**1.2**
602127	AOB8-GR-223-1.0-SS	Soil	07-01-99	1.0–1.5	2.2	80	0.36	**5.7**
602127	AOB8-GR-224-1.0-SS	Soil	07-01-99	1.0–1.5	2.8	110	0.5	0.48
602127	AOB8-GR-225-1.0-SS	Soil	07-01-99	1.0–1.5	2.5	94	0.4	0.25
602127	AOB8-GR-226-1.0-SS	Soil	07-01-99	1.0–1.5	3.2	120	0.56	**1.1**
602127	AOB8-GR-236-1.0-SS	Soil	07-01-99	1.0–1.5	2.6	110	0.52	**1**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chromium	Copper	Lead	Mercury
602121	AOB8-GR-101-0.0-SS	Soil	06-28-99	0–0.5	18	14	**37**	ND (0.04)
602121	AOB8-GR-102-0.0-SS	Soil	06-28-99	0–0.5	**19**	14	**32**	ND (0.039)
602121	AOB8-GR-103-0.0-SS	Soil	06-28-99	0–0.5	16	13	12	ND (0.038)
602121	AOB8-GR-104-0.0-SS	Soil	06-28-99	0–0.5	15	12	**35**	ND (0.038)
602121	AOB8-GR-105-0.0-SS	Soil	06-28-99	0–0.5	17	12	**33**	ND (0.039)
602121	AOB8-GR-106-0.0-SS	Soil	06-28-99	0–0.5	**22**	11	11	ND (0.041)
602121	AOB8-GR-107-0.0-SS	Soil	06-28-99	0–0.5	17	12	**33**	ND (0.038)
602121	AOB8-GR-108-0.0-SS	Soil	06-28-99	0–0.5	**20**	13	**34**	ND (0.04)
602121	AOB8-GR-109-0.0-SS	Soil	06-28-99	0–0.5	**20**	13	18	ND (0.039)
602121	AOB8-GR-110-0.0-SS	Soil	06-28-99	0–0.5	**21**	13	**41**	ND (0.038)
602121	AOB8-GR-111-0.0-SS	Soil	06-28-99	0–0.5	**19**	17	**200**	ND (0.04)
602121	AOB8-GR-112-0.0-SS	Soil	06-28-99	0–0.5	**19**	16	**50**	0.042 J (0.16)
602121	AOB8-GR-113-0.0-SS	Soil	06-28-99	0–0.5	18	**18**	**320**	ND (0.04)
602121	AOB8-GR-114-0.0-SS	Soil	06-28-99	0–0.5	16	**21**	**440**	ND (0.039)
602121	AOB8-GR-115-0.0-SS	Soil	06-28-99	0–0.5	**23**	**260**	**10,000**	ND (0.041)
602121	AOB8-GR-116-0.0-SS	Soil	06-28-99	0–0.5	17	17	**280**	ND (0.039)
602121	AOB8-GR-117-0.0-SS	Soil	06-28-99	0–0.5	**20**	**20**	**120**	ND (0.04)
602121	AOB8-GR-118-0.0-SS	Soil	06-28-99	0–0.5	16	17	**94**	ND (0.038)
602121	AOB8-GR-119-0.0-SS	Soil	06-28-99	0–0.5	16	**33**	**760**	ND (0.038)
602121	AOB8-GR-120-0.0-SS	Soil	06-28-99	0–0.5	17	**120**	**4,200**	ND (0.04)
602121	AOB8-GR-231-0.0-SS	Soil	06-28-99	0–0.5	17	**49**	**600**	ND (0.04)
602122	AOB8-GR-121-0.0-SS	Soil	06-28-99	0–0.5	16	**33**	**770**	ND (0.039)
602122	AOB8-GR-122-0.0-SS	Soil	06-28-99	0–0.5	**23**	**380**	**47,000**	ND (0.039)
602122	AOB8-GR-123-0.0-SS	Soil	06-28-99	0–0.5	**38**	**740**	**39,000**	ND (0.037)
602122	AOB8-GR-124-0.0-SS	Soil	06-28-99	0–0.5	17	**26**	**760**	ND (0.04)
602122	AOB8-GR-125-0.0-SS	Soil	06-28-99	0–0.5	16	**30**	**79**	ND (0.038)
602122	AOB8-GR-126-0.0-SS	Soil	06-28-99	0–0.5	16	16	**130**	ND (0.04)
602122	AOB8-GR-127-0.0-SS	Soil	06-28-99	0–0.5	16	**54**	**1,100**	ND (0.038)
602122	AOB8-GR-128-0.0-SS	Soil	06-28-99	0–0.5	14	**83**	**3,200**	ND (0.037)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.8	17.1	18.9	0.055

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chromium	Copper	Lead	Mercury
602122	AOB8-GR-129-0.0-SS	Soil	06-28-99	0–0.5	**22**	**290**	**4,500**	ND (0.04)
602122	AOB8-GR-130-0.0-SS	Soil	06-28-99	0–0.5	18	**120**	**3,100**	ND (0.04)
602122	AOB8-GR-131-0.0-SS	Soil	06-28-99	0–0.5	18	**94**	**1,400**	ND (0.04)
602122	AOB8-GR-132-0.0-SS	Soil	06-28-99	0–0.5	18	**28**	**590**	ND (0.038)
602122	AOB8-GR-133-0.0-SS	Soil	06-29-99	0–0.5	16	14	**73**	ND (0.04)
602122	AOB8-GR-134-0.0-SS	Soil	06-29-99	0–0.5	14	14	**130**	ND (0.038)
602122	AOB8-GR-135-0.0-SS	Soil	06-29-99	0–0.5	16	**18**	**170**	ND (0.04)
602122	AOB8-GR-136-0.0-SS	Soil	06-29-99	0–0.5	**22**	**100**	**2,800**	ND (0.039)
602122	AOB8-GR-137-0.0-SS	Soil	06-29-99	0–0.5	18	**58**	**720**	ND (0.04)
602122	AOB8-GR-138-0.0-SS	Soil	06-29-99	0–0.5	**26**	**120**	**270**	ND (0.041)
602122	AOB8-GR-139-0.0-SS	Soil	06-29-99	0–0.5	**160**	**300**	**12,000**	ND (0.04)
602122	AOB8-GR-140-0.0-SS	Soil	06-29-99	0–0.5	16	**21**	**300**	ND (0.038)
602122	AOB8-GR-232-0.0-SS	Soil	06-29-99	0–0.5	18	**19**	**19**	ND (0.04)
602123	AOB8-GR-141-0.0-SS	Soil	06-29-99	0–0.5	**19**	**18**	**510**	ND (0.04)
602123	AOB8-GR-142-0.0-SS	Soil	06-29-99	0–0.5	**19**	**18**	**400**	ND (0.038)
602123	AOB8-GR-143-0.0-SS	Soil	06-29-99	0–0.5	**44**	**31**	**62,000**	ND (0.04)
602123	AOB8-GR-144-0.0-SS	Soil	06-29-99	0–0.5	15	14	**120**	ND (0.041)
602123	AOB8-GR-145-0.0-SS	Soil	06-29-99	0–0.5	**19**	**18**	**270**	ND (0.039)
602123	AOB8-GR-146-0.0-SS	Soil	06-29-99	0–0.5	**60**	**55**	**16,000**	ND (0.038)
602123	AOB8-GR-147-0.0-SS	Soil	06-29-99	0–0.5	**32**	**1,300**	**14,000**	ND (0.04)
602123	AOB8-GR-148-0.0-SS	Soil	06-29-99	0–0.5	**75**	**25**	**230**	ND (0.04)
602123	AOB8-GR-149-0.0-SS	Soil	06-29-99	0–0.5	18	13	**33**	ND (0.04)
602123	AOB8-GR-150-0.0-SS	Soil	06-29-99	0–0.5	15	12	**36**	ND (0.038)
602123	AOB8-GR-151-0.0-SS	Soil	06-29-99	0–0.5	**25**	13	**100**	ND (0.04)
602123	AOB8-GR-152-0.0-SS	Soil	06-29-99	0–0.5	16	10	18	ND (0.04)
602123	AOB8-GR-153-0.0-SS	Soil	06-29-99	0–0.5	16	11	**24**	ND (0.041)
602123	AOB8-GR-154-0.0-SS	Soil	06-29-99	0–0.5	16	17	**210**	ND (0.041)
602123	AOB8-GR-155-0.0-SS	Soil	06-29-99	0–0.5	13	13	**57**	ND (0.04)
602123	AOB8-GR-156-0.0-SS	Soil	06-29-99	0–0.5	16	**18**	**86**	ND (0.04)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.8	17.1	18.9	0.055

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chromium	Copper	Lead	Mercury
602123	AOB8-GR-157-0.0-SS	Soil	06-29-99	0–0.5	16	13	**79**	ND (0.04)
602123	AOB8-GR-158-0.0-SS	Soil	06-29-99	0–0.5	14	11	**50**	ND (0.041)
602123	AOB8-GR-159-0.0-SS	Soil	06-29-99	0–0.5	17	12	**64**	ND (0.038)
602123	AOB8-GR-160-0.0-SS	Soil	06-29-99	0–0.5	15	17	**2,400**	ND (0.04)
602123	AOB8-GR-233-0.0-SS	Soil	06-29-99	0–0.5	17	**24**	**1,100**	ND (0.04)
602124	AOB8-GR-161-0.0-SS	Soil	06-29-99	0–0.5	17	16	**310**	ND (0.04)
602124	AOB8-GR-162-0.0-SS	Soil	06-29-99	0–0.5	17	15	**83**	ND (0.039)
602124	AOB8-GR-163-0.0-SS	Soil	06-29-99	0–0.5	16	15	**140**	ND (0.04)
602124	AOB8-GR-164-0.0-SS	Soil	06-29-99	0–0.5	17	16	**190**	ND (0.039)
602124	AOB8-GR-165-0.0-SS	Soil	06-30-99	0–0.5	**21**	**120**	**12,000**	ND (0.039)
602124	AOB8-GR-166-0.0-SS	Soil	06-30-99	0–0.5	**22**	**19**	**1,600**	ND (0.038)
602124	AOB8-GR-167-0.0-SS	Soil	06-30-99	0–0.5	18	16	**50**	ND (0.04)
602124	AOB8-GR-168-0.0-SS	Soil	06-30-99	0–0.5	18	**18**	**140**	ND (0.037)
602124	AOB8-GR-169-0.0-SS	Soil	06-30-99	0–0.5	17	**31**	**260**	ND (0.039)
602124	AOB8-GR-170-0.0-SS	Soil	06-30-99	0–0.5	18	**41**	**1,300**	ND (0.038)
602124	AOB8-GR-171-0.0-SS	Soil	06-30-99	0–0.5	**19**	**18**	**260**	ND (0.039)
602124	AOB8-GR-172-0.0-SS	Soil	06-30-99	0–0.5	16	11	14	ND (0.04)
602124	AOB8-GR-173-0.0-SS	Soil	06-30-99	0–0.5	17	16	**37**	ND (0.038)
602124	AOB8-GR-174-0.0-SS	Soil	06-30-99	0–0.5	12	**330**	**100**	ND (0.041)
602124	AOB8-GR-175-0.0-SS	Soil	06-30-99	0–0.5	15	16	**36**	ND (0.041)
602124	AOB8-GR-176-0.0-SS	Soil	06-30-99	0–0.5	15	14	**45**	ND (0.04)
602124	AOB8-GR-177-0.0-SS	Soil	06-30-99	0–0.5	16	12	18	ND (0.039)
602124	AOB8-GR-178-0.0-SS	Soil	06-30-99	0–0.5	16	17	**52**	ND (0.04)
602124	AOB8-GR-179-0.0-SS	Soil	06-30-99	0–0.5	**21**	**40**	**140**	ND (0.041)
602124	AOB8-GR-180-0.0-SS	Soil	06-30-99	0–0.5	17	**26**	**120**	ND (0.042)
602124	AOB8-GR-234-0.0-SS	Soil	06-30-99	0–0.5	**19**	**23**	**100**	ND (0.04)
602126	AOB8-GR-181-0.0-SS	Soil	06-30-99	0–0.5	**22**	**25**	**240**	ND (0.041)
602126	AOB8-GR-182-0.0-SS	Soil	06-30-99	0–0.5	**19**	13	17	ND (0.038)
602126	AOB8-GR-183-0.0-SS	Soil	06-30-99	0–0.5	**20**	13	**37**	ND (0.038)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.8	17.1	18.9	0.055

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chromium	Copper	Lead	Mercury
602126	AOB8-GR-184-0.0-SS	Soil	06-30-99	0–0.5	**35**	**170**	**33,000**	ND (0.039)
602126	AOB8-GR-185-0.0-SS	Soil	06-30-99	0–0.5	18	14	**33**	ND (0.041)
602126	AOB8-GR-186-0.0-SS	Soil	06-30-99	0–0.5	18	15	**32**	ND (0.04)
602126	AOB8-GR-187-0.0-SS	Soil	06-30-99	0–0.5	14	11	14	ND (0.037)
602126	AOB8-GR-188-0.0-SS	Soil	06-30-99	0–0.5	12	10	**82**	ND (0.04)
602126	AOB8-GR-189-0.0-SS	Soil	06-30-99	0–0.5	16	12	14	ND (0.039)
602126	AOB8-GR-190-0.0-SS	Soil	06-30-99	0–0.5	14	12	14	ND (0.037)
602126	AOB8-GR-191-0.0-SS	Soil	06-30-99	0–0.5	16	12	14	ND (0.04)
602126	AOB8-GR-192-0.0-SS	Soil	06-30-99	0–0.5	16	13	14	ND (0.039)
602126	AOB8-GR-193-0.0-SS	Soil	06-30-99	0–0.5	14	10	7.2	ND (0.041)
602126	AOB8-GR-194-0.0-SS	Soil	06-30-99	0–0.5	16	13	14	ND (0.038)
602126	AOB8-GR-195-0.0-SS	Soil	06-30-99	0–0.5	14	14	8.5	ND (0.039)
602126	AOB8-GR-196-0.0-SS	Soil	06-30-99	0–0.5	18	13	12	ND (0.039)
602127	AOB8-GR-221-1.0-SS	Soil	07-01-99	1.0–1.5	**22**	**29**	**240**	ND (0.041)
602127	AOB8-GR-222-1.0-SS	Soil	07-01-99	1.0–1.5	17	**87**	**800**	ND (0.042)
602127	AOB8-GR-223-1.0-SS	Soil	07-01-99	1.0–1.5	**29**	**97**	**120**	ND (0.037)
602127	AOB8-GR-224-1.0-SS	Soil	07-01-99	1.0–1.5	14	**22**	**1,100**	ND (0.04)
602127	AOB8-GR-225-1.0-SS	Soil	07-01-99	1.0–1.5	12	10	**51**	ND (0.039)
602127	AOB8-GR-226-1.0-SS	Soil	07-01-99	1.0–1.5	14	**220**	**12,000**	ND (0.041)
602127	AOB8-GR-236-1.0-SS	Soil	07-01-99	1.0–1.5	14	**180**	**8,500**	ND (0.04)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.8	17.1	18.9	0.055

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Nickel	Selenium	Silver	Zinc
602121	AOB8-GR-101-0.0-SS	Soil	06-28-99	0–0.5	11	0.64 J (1.2)	0.074 J (0.16)	**66**
602121	AOB8-GR-102-0.0-SS	Soil	06-28-99	0–0.5	11	0.73 J (1.2)	0.062 J (0.16)	47
602121	AOB8-GR-103-0.0-SS	Soil	06-28-99	0–0.5	14	0.44 J (1.1)	ND (0.038)	31
602121	AOB8-GR-104-0.0-SS	Soil	06-28-99	0–0.5	10	0.69 J (1.2)	0.069 J (0.15)	27
602121	AOB8-GR-105-0.0-SS	Soil	06-28-99	0–0.5	11	0.62 J (1.2)	0.039 J (0.16)	28
602121	AOB8-GR-106-0.0-SS	Soil	06-28-99	0–0.5	16	0.83 J (1.2)	0.044 J (0.16)	29
602121	AOB8-GR-107-0.0-SS	Soil	06-28-99	0–0.5	11	0.68 J (1.1)	ND (0.038)	26
602121	AOB8-GR-108-0.0-SS	Soil	06-28-99	0–0.5	13	0.69 J (1.2)	0.066 J (0.16)	38
602121	AOB8-GR-109-0.0-SS	Soil	06-28-99	0–0.5	12	0.77 J (1.2)	0.058 J (0.16)	32
602121	AOB8-GR-110-0.0-SS	Soil	06-28-99	0–0.5	12	0.56 J (1.1)	ND (0.038)	31
602121	AOB8-GR-111-0.0-SS	Soil	06-28-99	0–0.5	11	0.6 J (1.2)	ND (0.04)	30
602121	AOB8-GR-112-0.0-SS	Soil	06-28-99	0–0.5	11	0.69 J (1.2)	ND (0.039)	31
602121	AOB8-GR-113-0.0-SS	Soil	06-28-99	0–0.5	10	0.59 J (1.2)	ND (0.04)	29
602121	AOB8-GR-114-0.0-SS	Soil	06-28-99	0–0.5	12	0.8 J (1.2)	0.073 J (0.16)	43
602121	AOB8-GR-115-0.0-SS	Soil	06-28-99	0–0.5	16	0.81 J (1.2)	0.23	**170**
602121	AOB8-GR-116-0.0-SS	Soil	06-28-99	0–0.5	11	0.74 J (1.2)	0.079 J (0.15)	**56**
602121	AOB8-GR-117-0.0-SS	Soil	06-28-99	0–0.5	12	0.68 J (1.2)	0.072 J (0.16)	32
602121	AOB8-GR-118-0.0-SS	Soil	06-28-99	0–0.5	11	0.79 J (1.1)	0.064 J (0.15)	32
602121	AOB8-GR-119-0.0-SS	Soil	06-28-99	0–0.5	11	0.67 J (1.2)	0.095 J (0.15)	35
602121	AOB8-GR-120-0.0-SS	Soil	06-28-99	0–0.5	11	0.68 J (1.2)	0.18	**55**
602121	AOB8-GR-231-0.0-SS	Soil	06-28-99	0–0.5	11	0.84 J (1.2)	0.14 J (0.16)	34
602122	AOB8-GR-121-0.0-SS	Soil	06-28-99	0–0.5	12	0.68 J (1.2)	0.1 J (0.16)	39
602122	AOB8-GR-122-0.0-SS	Soil	06-28-99	0–0.5	15	0.44 J (1.2)	0.49	**160**
602122	AOB8-GR-123-0.0-SS	Soil	06-28-99	0–0.5	16	0.4 J (1.1)	**1.1**	**640**
602122	AOB8-GR-124-0.0-SS	Soil	06-28-99	0–0.5	12	0.79 J (1.2)	0.081 J (0.16)	34
602122	AOB8-GR-125-0.0-SS	Soil	06-28-99	0–0.5	12	0.91 J (1.1)	0.11 J (0.15)	37
602122	AOB8-GR-126-0.0-SS	Soil	06-28-99	0–0.5	10	0.59 J (1.2)	0.046 J (0.16)	26
602122	AOB8-GR-127-0.0-SS	Soil	06-28-99	0–0.5	14	0.62 J (1.2)	0.18	39
602122	AOB8-GR-128-0.0-SS	Soil	06-28-99	0–0.5	11	0.38 J (1.1)	0.13 J (0.15)	31
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	16.6	2.7	<0.50	52.1

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Nickel	Selenium	Silver	Zinc
602122	AOB8-GR-129-0.0-SS	Soil	06-28-99	0–0.5	15	0.58 J (1.2)	0.39	**57**
602122	AOB8-GR-130-0.0-SS	Soil	06-28-99	0–0.5	12	0.48 J (1.2)	**0.58**	**60**
602122	AOB8-GR-131-0.0-SS	Soil	06-28-99	0–0.5	11	0.6 J (1.2)	0.15 J (0.16)	52
602122	AOB8-GR-132-0.0-SS	Soil	06-28-99	0–0.5	11	0.42 J (1.1)	0.079 J (0.15)	35
602122	AOB8-GR-133-0.0-SS	Soil	06-29-99	0–0.5	10	0.48 J (1.2)	0.051 J (0.16)	31
602122	AOB8-GR-134-0.0-SS	Soil	06-29-99	0–0.5	10	0.4 J (1.1)	0.047 J (0.15)	28
602122	AOB8-GR-135-0.0-SS	Soil	06-29-99	0–0.5	11	0.47 J (1.2)	0.048 J (0.16)	29
602122	AOB8-GR-136-0.0-SS	Soil	06-29-99	0–0.5	**24**	0.32 J (1.2)	0.11 J (0.16)	44
602122	AOB8-GR-137-0.0-SS	Soil	06-29-99	0–0.5	12	0.41 J (1.2)	0.087 J (0.16)	40
602122	AOB8-GR-138-0.0-SS	Soil	06-29-99	0–0.5	11	0.37 J (1.2)	**1.1**	**140**
602122	AOB8-GR-139-0.0-SS	Soil	06-29-99	0–0.5	13	ND (0.3)	0.47	**480**
602122	AOB8-GR-140-0.0-SS	Soil	06-29-99	0–0.5	12	0.78 J (1.2)	0.079 J (0.15)	50
602122	AOB8-GR-232-0.0-SS	Soil	06-29-99	0–0.5	13	1.2	0.08 J (0.16)	**61**
602123	AOB8-GR-141-0.0-SS	Soil	06-29-99	0–0.5	12	0.8 J (1.2)	0.075 J (0.16)	**54**
602123	AOB8-GR-142-0.0-SS	Soil	06-29-99	0–0.5	12	0.7 J (1.1)	0.088 J (0.15)	50
602123	AOB8-GR-143-0.0-SS	Soil	06-29-99	0–0.5	16	1 J (1.2)	**1.2**	49
602123	AOB8-GR-144-0.0-SS	Soil	06-29-99	0–0.5	11	0.75 J (1.2)	0.056 J (0.16)	39
602123	AOB8-GR-145-0.0-SS	Soil	06-29-99	0–0.5	**17**	0.83 J (1.2)	0.068 J (0.16)	**110**
602123	AOB8-GR-146-0.0-SS	Soil	06-29-99	0–0.5	12	0.74 J (1.2)	0.19	**380**
602123	AOB8-GR-147-0.0-SS	Soil	06-29-99	0–0.5	**22**	0.64 J (1.2)	**5**	**290**
602123	AOB8-GR-148-0.0-SS	Soil	06-29-99	0–0.5	**20**	0.63 J (1.2)	0.071 J (0.16)	**300**
602123	AOB8-GR-149-0.0-SS	Soil	06-29-99	0–0.5	16	0.88 J (1.2)	0.052 J (0.16)	45
602123	AOB8-GR-150-0.0-SS	Soil	06-29-99	0–0.5	12	0.78 J (1.1)	0.047 J (0.15)	39
602123	AOB8-GR-151-0.0-SS	Soil	06-29-99	0–0.5	13	0.9 J (1.2)	0.063 J (0.16)	32
602123	AOB8-GR-152-0.0-SS	Soil	06-29-99	0–0.5	15	0.7 J (1.2)	0.058 J (0.16)	26
602123	AOB8-GR-153-0.0-SS	Soil	06-29-99	0–0.5	14	0.61 J (1.2)	0.046 J (0.16)	35
602123	AOB8-GR-154-0.0-SS	Soil	06-29-99	0–0.5	12	0.56 J (1.2)	0.1 J (0.16)	36
602123	AOB8-GR-155-0.0-SS	Soil	06-29-99	0–0.5	13	0.74 J (1.2)	0.06 J (0.16)	27
602123	AOB8-GR-156-0.0-SS	Soil	06-29-99	0–0.5	12	0.41 J (1.2)	0.067 J (0.16)	41
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	16.6	2.7	<0.50	52.1

Refer to footnotes at end of table.

Table B-16 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Nickel	Selenium	Silver	Zinc
602123	AOB8-GR-157-0.0-SS	Soil	06-29-99	0–0.5	13	0.54 J (1.2)	0.043 J (0.16)	28
602123	AOB8-GR-158-0.0-SS	Soil	06-29-99	0–0.5	13	0.5 J (1.2)	0.045 J (0.16)	26
602123	AOB8-GR-159-0.0-SS	Soil	06-29-99	0–0.5	**17**	0.6 J (1.1)	0.041 J (0.15)	30
602123	AOB8-GR-160-0.0-SS	Soil	06-29-99	0–0.5	12	0.5 J (1.2)	0.083 J (0.16)	38
602123	AOB8-GR-233-0.0-SS	Soil	06-29-99	0–0.5	13	0.53 J (1.2)	0.083 J (0.16)	40
602124	AOB8-GR-161-0.0-SS	Soil	06-29-99	0–0.5	12	0.61 J (1.2)	0.059 J (0.16)	42
602124	AOB8-GR-162-0.0-SS	Soil	06-29-99	0–0.5	12	0.64 J (1.2)	0.08 J (0.16)	45
602124	AOB8-GR-163-0.0-SS	Soil	06-29-99	0–0.5	11	0.51 J (1.2)	0.044 J (0.16)	44
602124	AOB8-GR-164-0.0-SS	Soil	06-29-99	0–0.5	13	0.43 J (1.2)	0.044 J (0.16)	40
602124	AOB8-GR-165-0.0-SS	Soil	06-30-99	0–0.5	**74**	0.52 J (1.2)	0.29	**580**
602124	AOB8-GR-166-0.0-SS	Soil	06-30-99	0–0.5	14	0.51 J (1.1)	0.07 J (0.15)	50
602124	AOB8-GR-167-0.0-SS	Soil	06-30-99	0–0.5	11	0.48 J (1.2)	ND (0.04)	38
602124	AOB8-GR-168-0.0-SS	Soil	06-30-99	0–0.5	**19**	0.37 J (1.1)	0.044 J (0.15)	42
602124	AOB8-GR-169-0.0-SS	Soil	06-30-99	0–0.5	14	0.52 J (1.2)	0.12 J (0.16)	**56**
602124	AOB8-GR-170-0.0-SS	Soil	06-30-99	0–0.5	**20**	0.33 J (1.1)	**1.7**	**57**
602124	AOB8-GR-171-0.0-SS	Soil	06-30-99	0–0.5	13	0.35 J (1.2)	0.045 J (0.16)	37
602124	AOB8-GR-172-0.0-SS	Soil	06-30-99	0–0.5	11	0.36 J (1.2)	0.064 J (0.16)	29
602124	AOB8-GR-173-0.0-SS	Soil	06-30-99	0–0.5	12	0.4 J (1.1)	0.088 J (0.15)	35
602124	AOB8-GR-174-0.0-SS	Soil	06-30-99	0–0.5	10	0.88 J (1.2)	0.21	**180**
602124	AOB8-GR-175-0.0-SS	Soil	06-30-99	0–0.5	11	0.66 J (1.2)	0.11 J (0.16)	33
602124	AOB8-GR-176-0.0-SS	Soil	06-30-99	0–0.5	13	0.74 J (1.2)	0.085 J (0.16)	33
602124	AOB8-GR-177-0.0-SS	Soil	06-30-99	0–0.5	11	0.88 J (1.2)	0.12 J (0.16)	33
602124	AOB8-GR-178-0.0-SS	Soil	06-30-99	0–0.5	12	0.44 J (1.2)	0.12 J (0.16)	**140**
602124	AOB8-GR-179-0.0-SS	Soil	06-30-99	0–0.5	**18**	0.51 J (1.2)	0.12 J (0.16)	**490**
602124	AOB8-GR-180-0.0-SS	Soil	06-30-99	0–0.5	13	0.58 J (1.3)	0.12 J (0.17)	46
602124	AOB8-GR-234-0.0-SS	Soil	06-30-99	0–0.5	13	0.55 J (1.2)	0.12 J (0.16)	**56**
602126	AOB8-GR-181-0.0-SS	Soil	06-30-99	0–0.5	14	0.56 J (1.2)	0.12 J (0.16)	**58**
602126	AOB8-GR-182-0.0-SS	Soil	06-30-99	0–0.5	11	0.5 J (1.2)	0.056 J (0.15)	37
602126	AOB8-GR-183-0.0-SS	Soil	06-30-99	0–0.5	16	0.51 J (1.1)	0.066 J (0.15)	**110**
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	16.6	2.7	<0.50	52.1

Refer to footnotes at end of table.

Table B-16 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
June–July 1999
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Nickel	Selenium	Silver	Zinc
602126	AOB8-GR-184-0.0-SS	Soil	06-30-99	0–0.5	**37**	0.78 J (1.2)	**1.5**	**2,000**
602126	AOB8-GR-185-0.0-SS	Soil	06-30-99	0–0.5	12	0.52 J (1.2)	0.069 J (0.16)	**59**
602126	AOB8-GR-186-0.0-SS	Soil	06-30-99	0–0.5	16	1.1 J (1.2)	0.12 J (0.16)	44
602126	AOB8-GR-187-0.0-SS	Soil	06-30-99	0–0.5	11	0.64 J (1.1)	0.046 J (0.15)	34
602126	AOB8-GR-188-0.0-SS	Soil	06-30-99	0–0.5	10	0.57 J (1.2)	ND (0.04)	36
602126	AOB8-GR-189-0.0-SS	Soil	06-30-99	0–0.5	13	0.62 J (1.2)	0.064 J (0.16)	40
602126	AOB8-GR-190-0.0-SS	Soil	06-30-99	0–0.5	13	0.61 J (1.1)	0.049 J (0.15)	37
602126	AOB8-GR-191-0.0-SS	Soil	06-30-99	0–0.5	16	0.72 J (1.2)	0.044 J (0.16)	37
602126	AOB8-GR-192-0.0-SS	Soil	06-30-99	0–0.5	12	0.54 J (1.2)	0.063 J (0.15)	36
602126	AOB8-GR-193-0.0-SS	Soil	06-30-99	0–0.5	12	0.54 J (1.2)	ND (0.041)	30
602126	AOB8-GR-194-0.0-SS	Soil	06-30-99	0–0.5	12	0.56 J (1.1)	0.12 J (0.15)	39
602126	AOB8-GR-195-0.0-SS	Soil	06-30-99	0–0.5	11	0.55 J (1.2)	0.051 J (0.15)	32
602126	AOB8-GR-196-0.0-SS	Soil	06-30-99	0–0.5	15	0.66 J (1.2)	0.042 J (0.16)	39
602127	AOB8-GR-221-1.0-SS	Soil	07-01-99	1–1.5	**24**	0.81 J (1.2)	ND (0.041)	**380**
602127	AOB8-GR-222-1.0-SS	Soil	07-01-99	1–1.5	**20**	0.85 J (1.2)	0.34	**65**
602127	AOB8-GR-223-1.0-SS	Soil	07-01-99	1–1.5	10	0.44 J (1.1)	**0.56**	**110**
602127	AOB8-GR-224-1.0-SS	Soil	07-01-99	1–1.5	10	0.6 J (1.2)	ND (0.04)	26
602127	AOB8-GR-225-1.0-SS	Soil	07-01-99	1–1.5	9.8	0.55 J (1.2)	ND (0.039)	16
602127	AOB8-GR-226-1.0-SS	Soil	07-01-99	1–1.5	14	0.39 J (1.2)	0.16 J (0.16)	51
602127	AOB8-GR-236-1.0-SS	Soil	07-01-99	1–1.5	12	0.5 J (1.2)	0.14 J (0.16)	43
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	16.6	2.7	<0.50	52.1

Note: Values in **bold** exceed background concentrations, or have MDLs that exceed background concentrations.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Garcia November 1998.

AOB8 = SWMU 8 Area of Open Burning.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
na = Not analyzed.
NA = Not applicable.
ND = Note detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table B-17
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium
603142	AOB8-GR-301-0.0-SS	Soil	03-06-00	0–0.5	3.2	130	0.56	0.32
603142	AOB8-GR-302-0.0-SS	Soil	03-06-00	0–0.5	3.8	170	0.61	0.34
603142	AOB8-GR-303-0.0-SS	Soil	03-06-00	0–0.5	3.4	150	0.6	0.42
603142	AOB8-GR-304-0.0-SS	Soil	03-06-00	0–0.5	3.3	140	0.57	0.38
603142	AOB8-GR-305-0.0-SS	Soil	03-06-00	0–0.5	3	120	0.47	**0.87**
603142	AOB8-GR-306-0.0-SS	Soil	03-06-00	0–0.5	3	130	0.42	0.3
603142	AOB8-GR-307-0.0-SS	Soil	03-06-00	0–0.5	3	120	0.43	0.51
603142	AOB8-GR-342-0.0-SD	Soil	03-06-00	0–0.5	3.1	120	0.46	0.52
603142	AOB8-GR-308-0.0-SS	Soil	03-06-00	0–0.5	4.4	210	0.73	0.35
603142	AOB8-GR-309-0.0-SS	Soil	03-06-00	0–0.5	3.4	150	0.63	0.46
603142	AOB8-GR-310-0.0-SS	Soil	03-06-00	0–0.5	2.8	120	0.44	0.45
603142	AOB8-GR-311-0.5-SS	Soil	03-06-00	0.5–1.0	3.7	180	0.63	0.32
603142	AOB8-GR-312-1.0-SS	Soil	03-06-00	1.0–1.5	4.3	230	**0.8**	0.33
603142	AOB8-GR-313-1.5-SS	Soil	03-06-00	1.5–2.0	4.2	200 J	0.7	0.25
603142	AOB8-GR-314-0.0-SS	Soil	03-06-00	0–0.5	3.9	140 J	0.61	**0.67**
603142	AOB8-GR-315-0.5-SS	Soil	03-06-00	0.5–1.0	4.2	200 J	0.75	0.37
603142	AOB8-GR-316-1.0-SS	Soil	03-06-00	1.0–1.5	3.3	140 J	0.61	0.24
603142	AOB8-GR-317-1.5-SS	Soil	03-06-00	1.5–2.0	3.7	140 J	0.62	0.26
603142	AOB8-GR-318-1.0-SS	Soil	03-06-00	1.0–1.5	4.1	220 J	**0.79**	0.32
603142	AOB8-GR-319-1.5-SS	Soil	03-06-00	1.5–2.0	4.4	180 J	0.73	0.33
603142	AOB8-GR-320-1.0-SS	Soil	03-06-00	1.0–1.5	3.5	180 J	0.61	0.24
603142	AOB8-GR-321-1.5-SS	Soil	03-06-00	1.5–2.0	4.8	240 J	**0.87**	0.37
603142	AOB8-GR-343-1.5-SD	Soil	03-06-00	1.5–2.0	5	210 J	**0.82**	0.35
603142	AOB8-GR-322-1.0-SS	Soil	03-06-00	1.0–1.5	3.7	220 J	**0.78**	0.33
603142	AOB8-GR-323-1.5-SS	Soil	03-06-00	1.5–2.0	4.6	220 J	**0.86**	0.36
603144	AOB8-GR-324-1.0-SS	Soil	03-08-00	1.0–1.5	4.6	200	**0.86**	0.38
603144	AOB8-GR-325-1.5-SS	Soil	03-08-00	1.5–2.0	3.8	190	**0.81**	0.35
603144	AOB8-GR-326-1.0-SS	Soil	03-08-00	1.0–1.5	3.8	180	0.7	0.36
603144	AOB8-GR-327-1.5-SS	Soil	03-08-00	1.5–2.0	3.5	170	0.61	0.26
603144	AOB8-GR-328-1.0-SS	Soil	03-08-00	1.0–1.5	3.6	200	**0.81**	0.32
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64

Refer to footnotes at end of table.

Table B-17 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium
603144	AOB8-GR-329-1.5-SS	Soil	03-08-00	1.5–2.0	3.6	220	**0.82**	0.34
603144	AOB8-GR-330-1.0-SS	Soil	03-08-00	1.0–1.5	3.9	210	**0.8**	0.36
603144	AOB8-GR-331-1.5-SS	Soil	03-08-00	1.5–2.0	3.6	190	0.72	0.32
603144	AOB8-GR-332-1.0-SS	Soil	03-08-00	1.0–1.5	3.4	210	**0.76**	0.34
603144	AOB8-GR-333-1.5-SS	Soil	03-08-00	1.5–2.0	4.4	220	**0.82**	0.35
603144	AOB8-GR-334-1.0-SS	Soil	03-08-00	1.0–1.5	3.2	160	0.59	0.25
603144	AOB8-GR-335-1.5-SS	Soil	03-08-00	1.5–2.0	3.2	140	0.56	0.24
603144	AOB8-GR-336-1.0-SS	Soil	03-08-00	1.0–1.5	3.4	200	0.7	0.29
603144	AOB8-GR-337-1.5-SS	Soil	03-08-00	1.5–2.0	3.8	180	0.68	0.34
603144	AOB8-GR-338-1.0-SS	Soil	03-08-00	1.0–1.5	4.1	180	**0.76**	0.36
603144	AOB8-GR-339-1.5-SS	Soil	03-08-00	1.5–2.0	4	180	0.68	0.33
603144	AOB8-GR-340-1.0-SS	Soil	03-08-00	1.0–1.5	4.3	220	**0.85**	0.42
603144	AOB8-GR-341-1.5-SS	Soil	03-08-00	1.5–2.0	4.7	220	**0.84**	0.39
603144	AOB8-GR-344-1.5-SD	Soil	03-08-00	1.5–2.0	4.4	220	**0.83**	0.42
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64

Refer to footnotes at end of table.

Table B-17 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chromium	Copper	Lead	Mercury
603142	AOB8-GR-301-0.0-SS	Soil	03-06-00	0–0.5	18	12	**24**	ND (0.039)
603142	AOB8-GR-302-0.0-SS	Soil	03-06-00	0–0.5	16	14	**19**	ND (0.041)
603142	AOB8-GR-303-0.0-SS	Soil	03-06-00	0–0.5	**20**	14	**39**	ND (0.04)
603142	AOB8-GR-304-0.0-SS	Soil	03-06-00	0–0.5	18	**18**	**34**	ND (0.042)
603142	AOB8-GR-305-0.0-SS	Soil	03-06-00	0–0.5	16	**76**	**1,600**	ND (0.041)
603142	AOB8-GR-306-0.0-SS	Soil	03-06-00	0–0.5	14	13	**21**	ND (0.038)
603142	AOB8-GR-307-0.0-SS	Soil	03-06-00	0–0.5	14	17	**65**	ND (0.04)
603142	AOB8-GR-342-0.0-SD	Soil	03-06-00	0–0.5	14	**18**	**76**	ND (0.041)
603142	AOB8-GR-308-0.0-SS	Soil	03-06-00	0–0.5	**20**	12	14	ND (0.042)
603142	AOB8-GR-309-0.0-SS	Soil	03-06-00	0–0.5	18	16	**44**	ND (0.042)
603142	AOB8-GR-310-0.0-SS	Soil	03-06-00	0–0.5	18	**20**	**87**	ND (0.039)
603142	AOB8-GR-311-0.5-SS	Soil	03-06-00	0.5–1.0	**20**	12	**38**	ND (0.042)
603142	AOB8-GR-312-1.0-SS	Soil	03-06-00	1.0–1.5	**24**	12	**21**	ND (0.042)
603142	AOB8-GR-313-1.5-SS	Soil	03-06-00	1.5–2.0	**19**	13	13	ND (0.042)
603142	AOB8-GR-314-0.0-SS	Soil	03-06-00	0–0.5	16	**19**	**190**	ND (0.04)
603142	AOB8-GR-315-0.5-SS	Soil	03-06-00	0.5–1.0	17	11	14	ND (0.041)
603142	AOB8-GR-316-1.0-SS	Soil	03-06-00	1.0–1.5	15	10	**91**	ND (0.04)
603142	AOB8-GR-317-1.5-SS	Soil	03-06-00	1.5–2.0	12	12	12	ND (0.041)
603142	AOB8-GR-318-1.0-SS	Soil	03-06-00	1.0–1.5	**20**	12	11	ND (0.041)
603142	AOB8-GR-319-1.5-SS	Soil	03-06-00	1.5–2.0	**19**	12	10	ND (0.042)
603142	AOB8-GR-320-1.0-SS	Soil	03-06-00	1.0–1.5	18	12	9.3	ND (0.04)
603142	AOB8-GR-321-1.5-SS	Soil	03-06-00	1.5–2.0	**23**	13	**26**	ND (0.042)
603142	AOB8-GR-343-1.5-SD	Soil	03-06-00	1.5–2.0	18	12	12	ND (0.041)
603142	AOB8-GR-322-1.0-SS	Soil	03-06-00	1.0–1.5	**21**	12	11	ND (0.04)
603142	AOB8-GR-323-1.5-SS	Soil	03-06-00	1.5–2.0	**20**	13	12	ND (0.04)
603144	AOB8-GR-324-1.0-SS	Soil	03-08-00	1.0–1.5	**22**	11	13	ND (0.044)
603144	AOB8-GR-325-1.5-SS	Soil	03-08-00	1.5–2.0	**20**	10	11	ND (0.044)
603144	AOB8-GR-326-1.0-SS	Soil	03-08-00	1.0–1.5	**20**	12	16	ND (0.04)
603144	AOB8-GR-327-1.5-SS	Soil	03-08-00	1.5–2.0	14	10	11	ND (0.042)
603144	AOB8-GR-328-1.0-SS	Soil	03-08-00	1.0–1.5	**21**	10	10	ND (0.044)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.8	17.1	18.9	0.055

Refer to footnotes at end of table.

Table B-17 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Chromium	Copper	Lead	Mercury
603144	AOB8-GR-329-1.5-SS	Soil	03-08-00	1.5–2.0	18	12	11	ND (0.043)
603144	AOB8-GR-330-1.0-SS	Soil	03-08-00	1.0–1.5	**22**	11	12	ND (0.043)
603144	AOB8-GR-331-1.5-SS	Soil	03-08-00	1.5–2.0	14	10	10	ND (0.042)
603144	AOB8-GR-332-1.0-SS	Soil	03-08-00	1.0–1.5	18	12	**19**	ND (0.044)
603144	AOB8-GR-333-1.5-SS	Soil	03-08-00	1.5–2.0	**20**	13	15	ND (0.04)
603144	AOB8-GR-334-1.0-SS	Soil	03-08-00	1.0–1.5	13	8	10	ND (0.044)
603144	AOB8-GR-335-1.5-SS	Soil	03-08-00	1.5–2.0	15	14	12	ND (0.044)
603144	AOB8-GR-336-1.0-SS	Soil	03-08-00	1.0–1.5	16	9.6	10	ND (0.04)
603144	AOB8-GR-337-1.5-SS	Soil	03-08-00	1.5–2.0	18	12	13	ND (0.044)
603144	AOB8-GR-338-1.0-SS	Soil	03-08-00	1.0–1.5	**21**	10	11	ND (0.044)
603144	AOB8-GR-339-1.5-SS	Soil	03-08-00	1.5–2.0	14	12	14	ND (0.042)
603144	AOB8-GR-340-1.0-SS	Soil	03-08-00	1.0–1.5	**25**	12	12	ND (0.043)
603144	AOB8-GR-341-1.5-SS	Soil	03-08-00	1.5–2.0	**21**	11	11	ND (0.041)
603144	AOB8-GR-344-1.5-SD	Soil	03-08-00	1.5–2.0	**20**	12	11	ND (0.041)
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.8	17.1	18.9	0.055

Refer to footnotes at end of table.

Table B-17 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Nickel	Selenium	Silver	Zinc
603142	AOB8-GR-301-0.0-SS	Soil	03-06-00	0–0.5	11	0.5 J (1.2)	ND (0.039)	40
603142	AOB8-GR-302-0.0-SS	Soil	03-06-00	0–0.5	14	0.71 J (1.2)	ND (0.041)	44
603142	AOB8-GR-303-0.0-SS	Soil	03-06-00	0–0.5	13	0.62 J (1.2)	ND (0.04)	50
603142	AOB8-GR-304-0.0-SS	Soil	03-06-00	0–0.5	11	0.43 J (0.31)	ND (0.042)	42
603142	AOB8-GR-305-0.0-SS	Soil	03-06-00	0–0.5	12	0.43 J (1.2)	0.069 J (0.16)	**62**
603142	AOB8-GR-306-0.0-SS	Soil	03-06-00	0–0.5	11	0.58 J (1.1)	0.059 J (0.15)	46
603142	AOB8-GR-307-0.0-SS	Soil	03-06-00	0–0.5	12	0.4 J (1.2)	0.11 J (0.16)	45
603142	AOB8-GR-342-0.0-SD	Soil	03-06-00	0–0.5	11	0.48 J (1.2)	ND (0.041)	46
603142	AOB8-GR-308-0.0-SS	Soil	03-06-00	0–0.5	16	0.71 J (1.3)	ND (0.042)	49
603142	AOB8-GR-309-0.0-SS	Soil	03-06-00	0–0.5	12	ND (0.32)	ND (0.042)	50
603142	AOB8-GR-310-0.0-SS	Soil	03-06-00	0–0.5	12	0.42 J (1.2)	ND (0.039)	42
603142	AOB8-GR-311-0.5-SS	Soil	03-06-00	0.5–1.0	15	0.42 J (1.2)	ND (0.042)	44
603142	AOB8-GR-312-1.0-SS	Soil	03-06-00	1.0–1.5	16	0.57 J (1.3)	ND (0.042)	45
603142	AOB8-GR-313-1.5-SS	Soil	03-06-00	1.5–2.0	14	0.71 J (1.3)	0.046 J (0.17)	42
603142	AOB8-GR-314-0.0-SS	Soil	03-06-00	0–0.5	14	0.51 J (1.2)	0.07 J (0.16)	50
603142	AOB8-GR-315-0.5-SS	Soil	03-06-00	0.5–1.0	**17**	1 J (1.2)	0.084 J (0.16)	42
603142	AOB8-GR-316-1.0-SS	Soil	03-06-00	1.0–1.5	11	0.34 J (1.2)	ND (0.04)	38
603142	AOB8-GR-317-1.5-SS	Soil	03-06-00	1.5–2.0	11	0.56 J (1.2)	ND (0.041)	38
603142	AOB8-GR-318-1.0-SS	Soil	03-06-00	1.0–1.5	**17**	0.59 J (1.2)	ND (0.041)	45
603142	AOB8-GR-319-1.5-SS	Soil	03-06-00	1.5–2.0	14	0.6 J (1.3)	ND (0.042)	45
603142	AOB8-GR-320-1.0-SS	Soil	03-06-00	1.0–1.5	15	0.5 J (1.2)	ND (0.04)	43
603142	AOB8-GR-321-1.5-SS	Soil	03-06-00	1.5–2.0	**17**	0.55 J (1.3)	0.052 J (0.17)	49
603142	AOB8-GR-343-1.5-SD	Soil	03-06-00	1.5–2.0	15	0.64 J (1.2)	0.05 J (0.16)	44
603142	AOB8-GR-322-1.0-SS	Soil	03-06-00	1.0–1.5	16	0.69 J (1.2)	0.04	46
603142	AOB8-GR-323-1.5-SS	Soil	03-06-00	1.5–2.0	**17**	0.36 J (1.2)	0.045 J (0.16)	49
603144	AOB8-GR-324-1.0-SS	Soil	03-08-00	1.0–1.5	15	0.81 J (1.3)	0.054 J (0.17)	43
603144	AOB8-GR-325-1.5-SS	Soil	03-08-00	1.5–2.0	14	0.84 J (1.3)	ND (0.044)	40
603144	AOB8-GR-326-1.0-SS	Soil	03-08-00	1.0–1.5	14	0.8 J (1.2)	0.046 J (0.16)	42
603144	AOB8-GR-327-1.5-SS	Soil	03-08-00	1.5–2.0	13	0.65 J (1.2)	ND (0.042)	37
603144	AOB8-GR-328-1.0-SS	Soil	03-08-00	1.0–1.5	15	0.59 J (1.3)	ND (0.044)	42
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	16.6	2.7	<0.50	52.1

Refer to footnotes at end of table.

Table B-17 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Metals Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Metals (EPA Method 6020[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Nickel	Selenium	Silver	Zinc
603144	AOB8-GR-329-1.5-SS	Soil	03-08-00	1.5–2.0	15	0.74 J (1.3)	0.046 J (0.17)	44
603144	AOB8-GR-330-1.0-SS	Soil	03-08-00	1.0–1.5	15	0.79 J (1.3)	ND (0.043)	43
603144	AOB8-GR-331-1.5-SS	Soil	03-08-00	1.5–2.0	13	0.55 J (1.2)	ND (0.042)	40
603144	AOB8-GR-332-1.0-SS	Soil	03-08-00	1.0–1.5	15	0.74 J (1.3)	ND (0.044)	43
603144	AOB8-GR-333-1.5-SS	Soil	03-08-00	1.5–2.0	16	0.69 J (1.2)	0.043 J (0.16)	45
603144	AOB8-GR-334-1.0-SS	Soil	03-08-00	1.0–1.5	12	0.77 J (1.3)	ND (0.044)	34
603144	AOB8-GR-335-1.5-SS	Soil	03-08-00	1.5–2.0	12	0.52 J (1.3)	ND (0.044)	36
603144	AOB8-GR-336-1.0-SS	Soil	03-08-00	1.0–1.5	14	0.71 J (1.2)	ND (0.04)	38
603144	AOB8-GR-337-1.5-SS	Soil	03-08-00	1.5–2.0	15	ND (0.33)	0.071 J (0.18)	46
603144	AOB8-GR-338-1.0-SS	Soil	03-08-00	1.0–1.5	16	0.5 J (1.3)	ND (0.044)	43
603144	AOB8-GR-339-1.5-SS	Soil	03-08-00	1.5–2.0	15	0.54 J (1.2)	0.047 J (0.17)	42
603144	AOB8-GR-340-1.0-SS	Soil	03-08-00	1.0–1.5	16	0.44 J (1.3)	0.053 J (0.17)	46
603144	AOB8-GR-341-1.5-SS	Soil	03-08-00	1.5–2.0	15	0.4 J (1.2)	0.051 J (0.16)	44
603144	AOB8-GR-344-1.5-SD	Soil	03-08-00	1.5–2.0	15	0.47 J (1.2)	0.06 J (0.16)	44
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	16.6	2.7	<0.50	52.1

Note: Values in **bold** exceed background concentrations, or have MDLs that exceed background concentrations.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Garcia November 1998.

AOB8 = SWMU 8 Area of Open Burning.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
SD = Soil duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table B-18
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Gamma Spectroscopy Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-238		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
603143	AOB8-GR-301-0.0-SS	Soil	03-06-00	0–0.5	ND (0.571)	--	0.820	0.882
603143	AOB8-GR-302-0.0-SS	Soil	03-06-00	0–0.5	ND (0.543)	--	ND (0.168)	--
603143	AOB8-GR-303-0.0-SS	Soil	03-06-00	0–0.5	ND (0.583)	--	ND (0.167)	--
603143	AOB8-GR-304-0.0-SS	Soil	03-06-00	0–0.5	ND (0.554)	--	0.723	0.436
603143	AOB8-GR-305-0.0-SS	Soil	03-06-00	0–0.5	1.13	0.619	ND (0.189)	--
603143	AOB8-GR-306-0.0-SS	Soil	03-06-00	0–0.5	ND (0.523)	--	ND (0.155)	--
603143	AOB8-GR-307-0.0-SS	Soil	03-06-00	0–0.5	ND (0.628)	--	0.693	0.403
603143	AOB8-GR-342-0.0-SS	Soil	03-06-00	0–0.5	0.854	0.629	ND (0.203)	--
603143	AOB8-GR-308-0.0-SD	Soil	03-06-00	0–0.5	ND (0.535)	--	ND (0.171)	--
603143	AOB8-GR-309-0.0-SS	Soil	03-06-00	0–0.5	ND (0.619)	--	ND (0.184)	--
603143	AOB8-GR-310-0.0-SS	Soil	03-06-00	0–0.5	ND (0.483)	--	0.677	0.365
603143	AOB8-GR-311-0.5-S[d]	Soil	03-06-00	0.5–1.0	ND (0.586)	--	0.751	0.423
603143	AOB8-GR-312-1.0-S[d]	Soil	03-06-00	1.0–1.5	ND (0.758)	--	0.851	0.404
603143	AOB8-GR-313-1.5-S[d]	Soil	03-06-00	1.5–2.0	ND (0.742)	--	0.859	0.443
603143	AOB8-GR-314-0.0-SS	Soil	03-06-00	0–0.5	ND (0.759)	--	0.864	0.456
603143	AOB8-GR-315-0.5-S[d]	Soil	03-06-00	0.5–1.0	ND (0.737)	--	0.835	0.437
603143	AOB8-GR-316-1.0-S[d]	Soil	03-06-00	1.0–1.5	ND (0.713)	--	0.889	0.449
603143	AOB8-GR-317-1.5-S[d]	Soil	03-06-00	1.5–2.0	ND (0.780)	--	0.932	0.479
603143	AOB8-GR-318-1.0-S[d]	Soil	03-06-00	1.0–1.5	ND (0.805)	--	0.838	0.454
603143	AOB8-GR-319-1.5-S[d]	Soil	03-06-00	1.5–2.0	ND (0.807)	--	0.886	0.465
603143	AOB8-GR-320-1.0-S[d]	Soil	03-06-00	1.0–1.5	ND (0.754)	--	0.897	0.461
603143	AOB8-GR-321-1.5-S[d]	Soil	03-06-00	1.5–2.0	ND (0.814)	--	0.789	0.437
603143	AOB8-GR-343-1.5-SD[d]	Soil	03-06-00	1.5–2.0	ND (0.781)	--	0.803	0.422
603143	AOB8-GR-322-1.0-S[d]	Soil	03-06-00	1.0–1.5	ND (0.493)	--	0.178	0.148
603143	AOB8-GR-323-1.5-S[d]	Soil	03-06-00	1.5–2.0	ND (0.622)	--	0.941	0.520
603145	AOB8-GR-324-1.0-SS	Soil	03-08-00	1.0–1.5	ND (0.618)	--	ND (0.168)	--
603145	AOB8-GR-325-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.682)	--	ND (0.186)	--
603145	AOB8-GR-326-1.0-SS	Soil	03-08-00	1.0–1.5	ND (0.592)	--	0.811	0.463
Background Activities—Lower Canyons Area[e]		Soil	NA	NA	2.31	NA	1.03	NA

Refer to footnotes at end of table.

Table B-18 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Gamma Spectroscopy Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-238		Thorium-232	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
603145	AOB8-GR-327-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.588)	--	ND (0.169)	--
603145	AOB8-GR-328-1.0-SS	Soil	03-08-00	1.0–1.5	ND (0.564)	--	0.884	0.478
603145	AOB8-GR-329-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.680)	--	0.929	0.541
603145	AOB8-GR-330-1.0-SS	Soil	03-08-00	1.0–1.5	ND (0.594)	--	0.821	0.444
603145	AOB8-GR-331-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.613)	--	0.938	0.510
603145	AOB8-GR-332-1.0-SS	Soil	03-08-00	1.0–1.5	0.626	0.564	0.763	0.457
603145	AOB8-GR-333-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.661)	--	0.855	0.844
603145	AOB8-GR-334-1.0-SS	Soil	03-08-00	1.0–1.5	ND (0.598)	--	ND (0.159)	--
603145	AOB8-GR-335-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.670)	--	ND (0.194)	--
603145	AOB8-GR-336-1.0-SS	Soil	03-08-00	1.0–1.5	ND (0.790)	--	0.791	0.976
603145	AOB8-GR-337-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.811)	--	0.948	0.913
603145	AOB8-GR-338-1.0-SS	Soil	03-08-00	1.0–1.5	ND (0.759)	--	ND (0.145)	--
603145	AOB8-GR-339-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.887)	--	0.991	0.534
603145	AOB8-GR-340-1.0-SS	Soil	03-08-00	1.0–1.5	ND (0.831)	--	0.869	1.57
603145	AOB8-GR-341-1.5-SS	Soil	03-08-00	1.5–2.0	ND (0.879)	--	**1.04**	0.540
603145	AOB8-GR-344-1.5-SD	Soil	03-08-00	1.5–2.0	ND (0.899)	--	0.903	0.481
Background Activities—Lower Canyons Area[e]		Soil	NA	NA	2.31	NA	1.03	NA

Refer to footnotes at end of table.

Table B-18 (Continued)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Gamma Spectroscopy Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Cesium-137	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
603143	AOB8-GR-301-0.0-SS	Soil	03-06-00	0–0.5	**0.233**	0.170	0.210	0.136
603143	AOB8-GR-302-0.0-SS	Soil	03-06-00	0–0.5	**ND (0.198)**	--	0.206	0.0616
603143	AOB8-GR-303-0.0-SS	Soil	03-06-00	0–0.5	ND (0.126)	--	0.496	0.0983
603143	AOB8-GR-304-0.0-SS	Soil	03-06-00	0–0.5	0.114	0.178	ND (0.0285)	--
603143	AOB8-GR-305-0.0-SS	Soil	03-06-00	0–0.5	ND (0.129)	--	0.422	0.0953
603143	AOB8-GR-306-0.0-SS	Soil	03-06-00	0–0.5	**ND (0.198)**	--	0.0882	0.128
603143	AOB8-GR-307-0.0-SS	Soil	03-06-00	0–0.5	**ND (0.221)**	--	0.476	0.196
603143	AOB8-GR-342-0.0-SS	Soil	03-06-00	0–0.5	**ND (0.227)**	--	0.602	0.411
603143	AOB8-GR-308-0.0-SD	Soil	03-06-00	0–0.5	ND (0.0931)	--	0.0762	0.0430
603143	AOB8-GR-309-0.0-SS	Soil	03-06-00	0–0.5	0.141	0.190	0.850	0.144
603143	AOB8-GR-310-0.0-SS	Soil	03-06-00	0–0.5	0.116	0.152	0.122	0.0473
603143	AOB8-GR-311-0.5-S[d]	Soil	03-06-00	0.5–1.0	0.133	0.180	ND (0.0402)	--
603143	AOB8-GR-312-1.0-S[d]	Soil	03-06-00	1.0–1.5	**0.186**	0.173	ND (0.0297)	--
603143	AOB8-GR-313-1.5-S[d]	Soil	03-06-00	1.5–2.0	0.148	0.166	ND (0.0290)	--
603143	AOB8-GR-314-0.0-SS	Soil	03-06-00	0–0.5	**ND (0.210)**	--	0.456	0.0847
603143	AOB8-GR-315-0.5-S[d]	Soil	03-06-00	0.5–1.0	0.104	0.163	0.0212	0.0367
603143	AOB8-GR-316-1.0-S[d]	Soil	03-06-00	1.0–1.5	**ND (0.202)**	--	ND (0.0280)	--
603143	AOB8-GR-317-1.5-S[d]	Soil	03-06-00	1.5–2.0	**ND (0.216)**	--	ND (0.0317)	--
603143	AOB8-GR-318-1.0-S[d]	Soil	03-06-00	1.0–1.5	**ND (0.230)**	--	ND (0.0309)	--
603143	AOB8-GR-319-1.5-S[d]	Soil	03-06-00	1.5–2.0	**ND (0.226)**	--	ND (0.0318)	--
603143	AOB8-GR-320-1.0-S[d]	Soil	03-06-00	1.0–1.5	**0.196**	0.178	ND (0.0314)	--
603143	AOB8-GR-321-1.5-S[d]	Soil	03-06-00	1.5–2.0	**ND (0.222)**	--	ND (0.0324)	--
603143	AOB8-GR-343-1.5-SD[d]	Soil	03-06-00	1.5–2.0	**0.199**	0.177	ND (0.0308)	--
603143	AOB8-GR-322-1.0-S[d]	Soil	03-06-00	1.0–1.5	0.0994	0.110	ND (0.0180)	--
603143	AOB8-GR-323-1.5-S[d]	Soil	03-06-00	1.5–2.0	**ND (0.220)**	--	ND (0.0395)	--
603145	AOB8-GR-324-1.0-SS	Soil	03-08-00	1.0–1.5	**0.183**	0.191	ND (0.0447)	--
603145	AOB8-GR-325-1.5-SS	Soil	03-08-00	1.5–2.0	**ND (0.240)**	--	ND (0.0464)	--
603145	AOB8-GR-326-1.0-SS	Soil	03-08-00	1.0–1.5	**ND (0.214)**	--	ND (0.0393)	--
Background Activities—Lower Canyons Area[e]		Soil	NA	NA	0.160	NA	1.55	NA

Refer to footnotes at end of table.

Table B-18 (Concluded)
Summary of SWMU 8, Features 8PP and 8RR (Area of Open Burning) Soil Sampling
Gamma Spectroscopy Analytical Results
March 2000
(On-Site Laboratory)

Sample Attributes					Gamma Spectroscopy Activity[a] (pCi/g)			
					Uranium-235		Cesium-137	
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Result	Error[c]	Result	Error[c]
603145	AOB8-GR-327-1.5-SS	Soil	03-08-00	1.5–2.0	**ND (0.218)**	--	ND (0.0389)	--
603145	AOB8-GR-328-1.0-SS	Soil	03-08-00	1.0–1.5	**ND (0.206)**	--	ND (0.0375)	--
603145	AOB8-GR-329-1.5-SS	Soil	03-08-00	1.5–2.0	**ND (0.243)**	--	ND (0.0440)	--
603145	AOB8-GR-330-1.0-SS	Soil	03-08-00	1.0–1.5	**ND (0.189)**	--	ND (0.0369)	--
603145	AOB8-GR-331-1.5-SS	Soil	03-08-00	1.5–2.0	**ND (0.216)**	--	ND (0.0403)	--
603145	AOB8-GR-332-1.0-SS	Soil	03-08-00	1.0–1.5	**0.199**	0.191	ND (0.0434)	--
603145	AOB8-GR-333-1.5-SS	Soil	03-08-00	1.5–2.0	**ND (0.230)**	--	ND (0.0435)	--
603145	AOB8-GR-334-1.0-SS	Soil	03-08-00	1.0–1.5	**0.172**	0.185	ND (0.0400)	--
603145	AOB8-GR-335-1.5-SS	Soil	03-08-00	1.5–2.0	**ND (0.223)**	--	0.0514	0.0293
603145	AOB8-GR-336-1.0-SS	Soil	03-08-00	1.0–1.5	**ND (0.228)**	--	ND (0.0305)	--
603145	AOB8-GR-337-1.5-SS	Soil	03-08-00	1.5–2.0	**ND (0.231)**	--	ND (0.0313)	--
603145	AOB8-GR-338-1.0-SS	Soil	03-08-00	1.0–1.5	**ND (0.224)**	--	ND (0.0298)	--
603145	AOB8-GR-339-1.5-SS	Soil	03-08-00	1.5–2.0	**ND (0.246)**	--	ND (0.0326)	--
603145	AOB8-GR-340-1.0-SS	Soil	03-08-00	1.0–1.5	0.143	0.188	ND (0.0327)	--
603145	AOB8-GR-341-1.5-SS	Soil	03-08-00	1.5–2.0	0.120	0.200	ND (0.0355)	--
603145	AOB8-GR-344-1.5-SD	Soil	03-08-00	1.5–2.0	**ND (0.246)**	--	ND (0.0353)	--
Background Activities—Lower Canyons Area[e]		Soil	NA	NA	0.160	NA	1.55	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]Thorium-232 and uranium-238 decay chain isotopes with short half-lives are not presented in this table.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean activity.
[d]Sample depth on the chain of custody was corrected.
[e]Dinwiddie September 1997.

AOB8 = SWMU 8 Area of Open Burning.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the minimum detectable activity, shown in parentheses.
pCi/g = Picocurie(s) per gram.
S = Soil sample.
SD = Soil duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table B-19
Summary of SWMU 58, Feature 58FF Soil Sampling, Metals Analytical Results
April 1996
(Off-Site Laboratory)

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
April 1996 Borehole										
05073	58FF-GR-FF-0.-1.0-SS	Soil	04-16-96	0–1.0	2.20	155	0.424	0.158 J (0.248)	5.64	12.1
05073	58FF-GR-FF-0.-1.0-SSD	Soil	04-16-96	0–1.0	3.11	106	0.471 J (0.481)	0.244 J (0.481)	7.56 J	16.1
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	9.8	246	0.75	0.64	18.8	17.1

Sample Attributes					Metals (EPA Methods 6010 and 7470/7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID	Sample Matrix	Sample Date	Sample Depth (ft)	Lead	Mercury	Nickel	Selenium	Silver	Zinc
April 1996 Borehole										
05073	58FF-GR-FF-0.-1.0-SS	Soil	04-16-96	0–1.0	**219**	ANP	7.09	0.251	ND (0.124)	19.3
05073	58FF-GR-FF-0.-1.0-SSD	Soil	04-16-96	0–1.0	**5,610**	ND (0.02)	8.38 J	0.993	ND (0.0212)	26.8
NMED-Approved Background Values—Canyon Area[c]		Soil	NA	NA	18.9	0.055	16.6	2.7	<0.50	52.1

Note: Values in **bold** exceed background values or have MDLs that exceed background values.

[a]EPA November 1986.

[b]Analysis request/chain-of-custody record.

[c]Garcia November 1998.

58FF = SWMU 58, Feature FF.
ANP = Analyses not performed.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Estimated concentration.
J ( ) = The reported value is greater than or equal to the MDL but less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.
SS = Soil sample.
SSD = Soil sample duplicate
SWMU = Solid Waste Management Unit.

Sandia National Laboratories

Justification for Class III Permit Modification

January 2008

SWMUs 8 And 58
Operable Unit 1332
Canyons Blast Area
Volume 2 of 4

CAC (Vols.1-3) Submitted April 2005
RSI Response Submitted March 2006
NOD Response Submitted January 2007

Environmental
Restoration
Project

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

SANDIA NATIONAL LABORATORIES ENVIRONMENTAL RESTORATION PROJECT CORRECTIVE ACTION COMPLETE PROPOSAL SOLID WASTE MANAGEMENT UNIT 8, OPEN DUMP (COYOTE CANYON BLAST AREA) AND SOLID WASTE MANAGEMENT UNIT 58, COYOTE CANYON BLAST AREA, FOOTHILLS TEST AREA

April 2005

Volume 2 of 3

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

ANNEX C
Gamma Spectroscopy Results

Features 8Y and 58B

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 8-04-98 10:37:24 AM *
****
* *
* Analyzed by: 8/4/98 Reviewed by: 8/4/98 *
****

Customer : C.BYRD/TMAC (6134/SMO)
Customer Sample ID : 041915-003
Lab Sample ID : 80159001

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 869.000 gram
Sample Date/Time : 7-31-98 9:19:00 AM
Acquire Start Date/Time : 8-04-98 8:54:17 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	9.49E-01	6.72E-01	9.32E-01
TH-234	8.60E-01	2.77E-01	3.60E-01
RA-226	1.38E+00	6.17E-01	5.53E-01
PB-214	5.56E-01	1.06E+00	4.60E-02
BI-214	5.40E-01	1.30E-01	4.08E-02
PB-210	Not Detected	---	4.01E+00
TH-232	6.02E-01	3.60E-01	1.45E-01
RA-228	8.11E-01	4.80E-01	1.58E-01
AC-228	6.80E-01	1.85E-01	9.12E-02
TH-228	6.07E-01	4.09E-01	5.69E-01
RA-224	8.43E-01	2.95E-01	7.75E-02
PB-212	7.71E-01	1.36E-01	3.42E-02
BI-212	8.04E-01	5.37E-01	3.02E-01
TL-208	7.13E-01	1.46E-01	6.49E-02
U-235	Not Detected	---	1.78E-01
TH-231	Not Detected	---	2.03E+00
PA-231	Not Detected	---	3.40E+00
TH-227	Not Detected	---	3.35E-01
RA-223	Not Detected	---	1.51E-01
RN-219	Not Detected	---	3.68E-01
PB-211	Not Detected	---	8.53E-01
TL-207	Not Detected	---	1.39E+01
AM-241	Not Detected	---	1.43E-01
PU-239	Not Detected	---	3.12E+02
NP-237	Not Detected	---	1.67E-01
PA-233	Not Detected	---	5.88E-02
TH-229	Not Detected	---	1.73E-01

[Summary Report] - Sample ID: : 80159001

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.98E-02
AG-110m	Not Detected	---	5.40E-02
BA-133	Not Detected	---	5.61E-02
BE-7	1.06E-01	1.09E-01	1.55E-01
CD-109	~~1.71E+00~~	~~4.57E-01~~	5.71E-01 Not detected
CD-115	Not Detected	---	2.15E-01
CE-139	Not Detected	---	2.51E-02
CE-141	Not Detected	---	4.35E-02
CE-144	Not Detected	---	1.83E-01
CO-56	Not Detected	---	3.25E-02
CO-57	Not Detected	---	2.18E-02
CO-58	Not Detected	---	3.52E-02
CO-60	Not Detected	---	3.57E-02
CR-51	Not Detected	---	2.40E-01
CS-134	Not Detected	---	4.82E-02
CS-137	2.44E-01	1.12E-01	2.25E-02
EU-152	Not Detected	---	6.51E-02
EU-154	Not Detected	---	1.86E-01
EU-155	Not Detected	---	1.01E-01
FE-59	Not Detected	---	7.97E-02
GD-153	Not Detected	---	7.06E-02
HG-203	Not Detected	---	2.99E-02
I-131	Not Detected	---	3.67E-02
IR-192	Not Detected	---	2.76E-02
K-40	1.84E+01	2.75E+00	2.49E-01
KR-85	Not Detected	---	7.73E+00
MN-52	Not Detected	---	5.17E-02
MN-54	Not Detected	---	3.44E-02
MO-99	Not Detected	---	6.12E-01
NA-22	Not Detected	---	4.48E-02
NA-24	Not Detected	---	2.89E+00
NB-95	Not Detected	---	3.18E-01
ND-147	Not Detected	---	2.37E-01
NI-57	Not Detected	---	3.27E-01
NP-239	Not Detected	---	9.01E-02
RU-103	Not Detected	---	2.85E-02
RU-106	Not Detected	---	2.93E-01
SB-122	Not Detected	---	1.12E-01
SB-124	Not Detected	---	2.90E-02
SB-125	Not Detected	---	8.25E-02
SN-113	Not Detected	---	3.49E-02
TA-182	Not Detected	---	1.60E-01
TA-183	Not Detected	---	2.07E-01
TC-99m	Not Detected	---	1.46E+03
TL-201	Not Detected	---	1.88E-01
XE-133	Not Detected	---	2.60E-01
Y-88	Not Detected	---	2.40E-02
ZN-65	Not Detected	---	1.07E-01
ZR-95	Not Detected	---	6.02E-02

8/4/58

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 8-04-98 10:48:13 AM *
****
* *
* Analyzed by: 8/4/98 Reviewed by: S.B. Ebata 8/6/98 *
****

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 041916-003
Lab Sample ID : 80159101

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 972.000 gram
Sample Date/Time : 7-31-98 9:30:00 AM
Acquire Start Date/Time : 8-04-98 9:05:26 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	2.66E+00
TH-234	1.49E+00	5.65E-01	4.96E-01
RA-226	1.31E+00	6.43E-01	5.11E-01
PB-214	4.94E-01	8.66E-02	3.68E-02
BI-214	4.24E-01	9.80E-02	3.50E-02
PB-210	Not Detected	---------	2.74E+01
TH-232	6.10E-01	2.97E-01	1.16E-01
RA-228	7.58E-01	2.26E-01	1.19E-01
AC-228	5.98E-01	1.40E-01	8.99E-02
TH-228	7.17E-01	2.10E-01	3.70E-01
RA-224	5.84E-01	1.71E-01	5.29E-02
PB-212	6.18E-01	1.35E-01	3.35E-02
BI-212	7.95E-01	2.88E-01	2.22E-01
TL-208	6.00E-01	1.23E-01	5.27E-02
U-235	Not Detected	---------	1.88E-01
TH-231	Not Detected	---------	1.86E+00
PA-231	Not Detected	---------	3.04E+00
TH-227	Not Detected	---------	2.73E-01
RA-223	Not Detected	---------	2.01E-01
RN-219	Not Detected	---------	2.89E-01
PB-211	Not Detected	---------	6.69E-01
TL-207	Not Detected	---------	1.13E+01
AM-241	Not Detected	---------	3.84E-01
PU-239	Not Detected	---------	3.61E+02
NP-237	Not Detected	---------	2.52E-01
PA-233	Not Detected	---------	4.60E-02
TH-229	Not Detected	---------	2.04E-01

[Summary Report] - Sample ID: : 80159101

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	----------	3.23E-02
AG-110m	Not Detected	----------	3.40E-02
BA-133	Not Detected	----------	4.88E-02
BE-7	Not Detected	----------	2.23E-01
CD-109	~~1.70E+00~~	~~5.27E-01~~	8.59E-01
CD-115	Not Detected	----------	1.80E-01
CE-139	Not Detected	----------	2.37E-02
CE-141	Not Detected	----------	4.61E-02
CE-144	Not Detected	----------	1.99E-01
CO-56	Not Detected	----------	2.85E-02
CO-57	Not Detected	----------	2.49E-02
CO-58	Not Detected	----------	2.56E-02
CO-60	Not Detected	----------	2.77E-02
CR-51	Not Detected	----------	1.98E-01
CS-134	Not Detected	----------	3.48E-02
CS-137	1.05E-01	2.93E-02	2.00E-02
EU-152	Not Detected	----------	7.45E-02
EU-154	Not Detected	----------	1.48E-01
EU-155	Not Detected	----------	1.21E-01
FE-59	Not Detected	----------	6.01E-02
GD-153	Not Detected	----------	8.44E-02
HG-203	Not Detected	----------	2.63E-02
I-131	Not Detected	----------	3.00E-02
IR-192	Not Detected	----------	2.19E-02
K-40	1.87E+01	2.68E+00	1.92E-01
KR-85	Not Detected	----------	6.37E+00
MN-52	Not Detected	----------	3.67E-02
MN-54	Not Detected	----------	2.75E-02
MO-99	Not Detected	----------	5.00E-01
NA-22	Not Detected	----------	3.41E-02
NA-24	Not Detected	----------	2.29E+00
NB-95	Not Detected	----------	2.71E-01
ND-147	Not Detected	----------	1.93E-01
NI-57	Not Detected	----------	2.34E-01
NP-239	Not Detected	----------	1.09E-01
RU-103	Not Detected	----------	2.34E-02
RU-106	Not Detected	----------	2.36E-01
SB-122	Not Detected	----------	5.26E-02
SB-124	Not Detected	----------	2.35E-02
SB-125	Not Detected	----------	6.39E-02
SN-113	Not Detected	----------	3.02E-02
TA-182	Not Detected	----------	1.20E-01
TA-183	Not Detected	----------	5.64E-01
TC-99m	Not Detected	----------	1.56E+03
TL-201	Not Detected	----------	3.61E-01
XE-133	Not Detected	----------	4.18E-01
Y-88	Not Detected	----------	1.92E-02
ZN-65	Not Detected	----------	8.13E-02
ZR-95	Not Detected	----------	4.85E-02

Not detected
8/4/98

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
8-04-98 12:33:20 PM

Analyzed by: 8/4/98 Reviewed by: S.B. Cbarta 8/6/98

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 041917-003
Lab Sample ID : 80159102

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 887.000 gram
Sample Date/Time : 7-31-98 9:45:00 AM
Acquire Start Date/Time : 8-04-98 10:50:23 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.87E+00
TH-234	2.12E+00	5.59E-01	5.14E-01
RA-226	1.27E+00	4.15E-01	4.44E-01
PB-214	4.39E-01	3.65E-01	3.62E-02
BI-214	4.49E-01	8.95E-02	3.63E-02
PB-210	Not Detected	---	2.93E+01
TH-232	5.86E-01	2.85E-01	1.19E-01
RA-228	6.24E-01	8.48E-01	1.24E-01
AC-228	5.98E-01	9.45E-01	8.96E-02
TH-228	5.87E-01	2.11E-01	4.41E-01
RA-224	5.88E-01	2.19E-01	5.28E-02
PB-212	5.88E-01	1.12E-01	3.77E-02
BI-212	7.43E-01	3.47E-01	2.81E-01
TL-208	6.08E-01	1.31E-01	4.97E-02
U-235	Not Detected	---	1.91E-01
TH-231	Not Detected	---	1.89E+00
PA-231	Not Detected	---	3.21E+00
TH-227	Not Detected	---	2.83E-01
RA-223	Not Detected	---	2.13E-01
RN-219	Not Detected	---	3.14E-01
PB-211	Not Detected	---	6.98E-01
TL-207	Not Detected	---	1.09E+01
AM-241	Not Detected	---	4.03E-01
PU-239	Not Detected	---	3.74E+02
NP-237	Not Detected	---	2.34E-01
PA-233	Not Detected	---	4.83E-02
TH-229	Not Detected	---	2.15E-01

[Summary Report] - Sample ID: : 80159102

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.38E-02
AG-110m	Not Detected	---------	3.96E-02
BA-133	Not Detected	---------	5.09E-02
BE-7	1.80E-01	1.23E-01	1.52E-01
CD-109	~~1.50E+00~~	~~4.70E-01~~	7.98E-01 Not detected
CD-115	Not Detected	---------	1.90E-01
CE-139	Not Detected	---------	2.49E-02
CE-141	Not Detected	---------	4.70E-02
CE-144	Not Detected	---------	2.08E-01
CO-56	Not Detected	---------	2.86E-02
CO-57	Not Detected	---------	2.67E-02
CO-58	Not Detected	---------	2.61E-02
CO-60	Not Detected	---------	3.17E-02
CR-51	Not Detected	---------	2.11E-01
CS-134	Not Detected	---------	3.70E-02
CS-137	1.48E-01	4.11E-02	1.95E-02
EU-152	Not Detected	---------	7.98E-02
EU-154	Not Detected	---------	1.56E-01
EU-155	Not Detected	---------	1.30E-01
FE-59	Not Detected	---------	6.81E-02
GD-153	Not Detected	---------	9.10E-02
HG-203	Not Detected	---------	2.79E-02
I-131	Not Detected	---------	3.30E-02
IR-192	Not Detected	---------	2.36E-02
K-40	1.91E+01	3.42E+00	2.19E-01
KR-85	Not Detected	---------	6.52E+00
MN-52	Not Detected	---------	3.77E-02
MN-54	Not Detected	---------	2.79E-02
MO-99	Not Detected	---------	5.63E-01
NA-22	Not Detected	---------	3.82E-02
NA-24	Not Detected	---------	2.45E+00
NB-95	Not Detected	---------	2.85E-01
ND-147	Not Detected	---------	2.11E-01
NI-57	Not Detected	---------	1.28E-01
NP-239	Not Detected	---------	1.16E-01
RU-103	Not Detected	---------	2.61E-02
RU-106	Not Detected	---------	2.30E-01
SB-122	Not Detected	---------	9.13E-02
SB-124	Not Detected	---------	2.51E-02
SB-125	Not Detected	---------	6.64E-02
SN-113	Not Detected	---------	3.15E-02
TA-182	Not Detected	---------	1.30E-01
TA-183	Not Detected	---------	6.03E-01
TC-99m	Not Detected	---------	1.88E+03
TL-201	Not Detected	---------	3.79E-01
XE-133	Not Detected	---------	4.41E-01
Y-88	Not Detected	---------	1.78E-02
ZN-65	Not Detected	---------	8.74E-02
ZR-95	Not Detected	---------	4.77E-02

8/4/98

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 8-04-98 2:18:20 PM *
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* Analyzed by: 8/4/98 Reviewed by: S. B. Ebata 8/6/98 *

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 041918-003
Lab Sample ID : 80159103

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 810.000 gram
Sample Date/Time : 7-31-98 10:00:00 AM
Acquire Start Date/Time : 8-04-98 12:35:35 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.97E+00
TH-234	9.07E-01	4.68E-01	5.22E-01
RA-226	8.88E-01	8.57E-01	4.95E-01
PB-214	4.61E-01	1.60E-01	4.19E-02
BI-214	4.10E-01	9.94E-02	3.93E-02
PB-210	Not Detected	---	3.06E+01
TH-232	6.90E-01	3.34E-01	1.23E-01
RA-228	6.71E-01	1.81E-01	1.29E-01
AC-228	6.65E-01	1.82E-01	1.04E-01
TH-228	5.23E-01	2.20E-01	4.75E-01
RA-224	7.80E-01	2.48E-01	5.61E-02
PB-212	6.64E-01	1.13E-01	4.04E-02
BI-212	7.27E-01	3.15E-01	2.71E-01
TL-208	5.87E-01	1.36E-01	5.76E-02
U-235	Not Detected	---	2.05E-01
TH-231	Not Detected	---	2.05E+00
PA-231	Not Detected	---	3.47E+00
TH-227	Not Detected	---	3.07E-01
RA-223	Not Detected	---	2.24E-01
RN-219	Not Detected	---	3.34E-01
PB-211	Not Detected	---	7.47E-01
TL-207	Not Detected	---	1.20E+01
AM-241	Not Detected	---	4.30E-01
PU-239	Not Detected	---	3.98E+02
NP-237	~~2.95E-01~~	~~1.64E-01~~	2.08E-01 Not detected
PA-233	Not Detected	---	5.47E-02
TH-229	Not Detected	---	2.28E-01

8/4/98

[Summary Report] - Sample ID: : 80159103

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected		3.62E-02
AG-110m	Not Detected		5.39E-02
BA-133	Not Detected		5.56E-02
BE-7	Not Detected		2.46E-01
CD-109	Not Detected		7.10E-01
CD-115	Not Detected		2.10E-01
CE-139	Not Detected		2.68E-02
CE-141	Not Detected		5.05E-02
CE-144	Not Detected		2.17E-01
CO-56	Not Detected		3.08E-02
CO-57	Not Detected		2.83E-02
CO-58	Not Detected		2.92E-02
CO-60	Not Detected		3.42E-02
CR-51	Not Detected		2.28E-01
CS-134	Not Detected		3.89E-02
CS-137	3.31E-01	1.30E-01	2.13E-02
EU-152	Not Detected		8.47E-02
EU-154	Not Detected		1.66E-01
EU-155	Not Detected		1.37E-01
FE-59	Not Detected		7.13E-02
GD-153	Not Detected		9.42E-02
HG-203	Not Detected		2.99E-02
I-131	Not Detected		3.75E-02
IR-192	Not Detected		2.61E-02
K-40	2.06E+01	2.96E+00	2.02E-01
KR-85	Not Detected		7.30E+00
MN-52	Not Detected		4.36E-02
MN-54	Not Detected		3.31E-02
MO-99	Not Detected		6.22E-01
NA-22	Not Detected		3.92E-02
NA-24	Not Detected		2.54E+00
NB-95	Not Detected		3.13E-01
ND-147	Not Detected		2.28E-01
NI-57	Not Detected		2.71E-01
NP-239	Not Detected		1.24E-01
RU-103	Not Detected		2.89E-02
RU-106	Not Detected		2.56E-01
SB-122	Not Detected		1.04E-01
SB-124	Not Detected		2.69E-02
SB-125	Not Detected		7.60E-02
SN-113	Not Detected		3.38E-02
TA-182	Not Detected		1.42E-01
TA-183	Not Detected		6.51E-01
TC-99m	Not Detected		2.44E+03
TL-201	Not Detected		4.14E-01
XE-133	Not Detected		4.78E-01
Y-88	Not Detected		2.31E-02
ZN-65	Not Detected		9.77E-02
ZR-95	Not Detected		5.39E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 8-04-98 4:44:45 PM *
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* Analyzed by: 8/4/98 Reviewed by: S.B. Chadda 8/6/98 *

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 041919-003
Lab Sample ID : 80159104

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 914.000 gram
Sample Date/Time : 7-31-98 10:15:00 AM
Acquire Start Date/Time : 8-04-98 2:20:28 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.66E+00
TH-234	Not Detected	---	4.48E-01
RA-226	1.01E+00	5.84E-01	4.27E-01
PB-214	4.54E-01	1.35E-01	3.76E-02
BI-214	4.34E-01	9.22E-02	3.59E-02
PB-210	Not Detected	---	2.76E+01
TH-232	5.94E-01	3.05E-01	1.18E-01
RA-228	5.69E-01	1.52E-01	1.21E-01
AC-228	6.46E-01	1.55E-01	9.24E-02
TH-228	6.42E-01	2.02E-01	3.85E-01
RA-224	6.45E-01	2.01E-01	5.15E-02
PB-212	6.53E-01	1.09E-01	3.86E-02
BI-212	7.25E-01	2.68E-01	2.47E-01
TL-208	5.81E-01	1.20E-01	5.57E-02
U-235	Not Detected	---	1.89E-01
TH-231	Not Detected	---	1.87E+00
PA-231	Not Detected	---	3.21E+00
TH-227	Not Detected	---	2.83E-01
RA-223	Not Detected	---	2.12E-01
RN-219	Not Detected	---	2.92E-01
PB-211	Not Detected	---	6.58E-01
TL-207	Not Detected	---	1.18E+01
AM-241	Not Detected	---	3.84E-01
PU-239	Not Detected	---	3.62E+02
NP-237	~~3.89E-01~~	~~1.63E-01~~	2.31E-01 Not detected 8/4/98
PA-233	Not Detected	---	4.60E-02
TH-229	Not Detected	---	2.16E-01

[Summary Report] - Sample ID: : 80159104

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected		3.34E-02
AG-110m	Not Detected		3.56E-02
BA-133	Not Detected		5.04E-02
BE-7	Not Detected		2.24E-01
CD-109	Not Detected		7.87E-01
CD-115	Not Detected		1.95E-01
CE-139	Not Detected		2.38E-02
CE-141	Not Detected		4.63E-02
CE-144	Not Detected		1.98E-01
CO-56	Not Detected		2.78E-02
CO-57	Not Detected		2.51E-02
CO-58	Not Detected		2.65E-02
CO-60	Not Detected		2.85E-02
CR-51	Not Detected		2.12E-01
CS-134	Not Detected		3.59E-02
CS-137	1.17E-01	3.66E-02	1.93E-02
EU-152	Not Detected		7.50E-02
EU-154	Not Detected		1.54E-01
EU-155	Not Detected		1.24E-01
FE-59	Not Detected		6.47E-02
GD-153	Not Detected		8.92E-02
HG-203	Not Detected		2.67E-02
I-131	Not Detected		3.41E-02
IR-192	Not Detected		2.30E-02
K-40	1.83E+01	2.64E+00	1.95E-01
KR-85	Not Detected		6.47E+00
MN-52	Not Detected		3.66E-02
MN-54	Not Detected		2.80E-02
MO-99	Not Detected		5.52E-01
NA-22	Not Detected		3.64E-02
NA-24	Not Detected		2.69E+00
NB-95	Not Detected		2.92E-01
ND-147	Not Detected		2.02E-01
NI-57	Not Detected		1.39E-01
NP-239	Not Detected		1.12E-01
RU-103	Not Detected		2.53E-02
RU-106	Not Detected		2.25E-01
SB-122	Not Detected		8.97E-02
SB-124	Not Detected		2.39E-02
SB-125	Not Detected		6.71E-02
SN-113	Not Detected		3.13E-02
TA-182	Not Detected		1.21E-01
TA-183	Not Detected		5.79E-01
TC-99m	Not Detected		2.62E+03
TL-201	Not Detected		3.82E-01
XE-133	Not Detected		4.46E-01
Y-88	Not Detected		1.79E-02
ZN-65	Not Detected		8.20E-02
ZR-95	Not Detected		4.62E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
8-04-98 12:34:37 PM

Analyzed by: 8/4/98 Reviewed by: 8/4/98

Customer : C.BYRD/TMAC (6134/SMO)
Customer Sample ID : 041920-003
Lab Sample ID : 80159002

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 884.000 gram
Sample Date/Time : 7-31-98 10:30:00 AM
Acquire Start Date/Time : 8-04-98 10:51:15 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	1.15E+00	6.71E-01	8.63E-01
TH-234	1.07E+00	3.77E-01	3.56E-01
RA-226	9.85E-01	5.69E-01	4.73E-01
PB-214	4.75E-01	8.85E-02	4.08E-02
BI-214	4.63E-01	2.15E-01	3.91E-02
PB-210	Not Detected	---	3.87E+00
TH-232	7.21E-01	3.78E-01	1.25E-01
RA-228	5.76E-01	2.09E-01	1.52E-01
AC-228	6.69E-01	1.78E-01	9.04E-02
TH-228	5.79E-01	6.14E-01	6.04E-01
RA-224	7.17E-01	2.34E-01	7.57E-02
PB-212	6.76E-01	1.17E-01	3.30E-02
BI-212	7.45E-01	3.30E-01	3.06E-01
TL-208	6.34E-01	1.40E-01	6.44E-02
U-235	Not Detected	---	1.70E-01
TH-231	Not Detected	---	1.92E+00
PA-231	Not Detected	---	3.11E+00
TH-227	Not Detected	---	3.16E-01
RA-223	Not Detected	---	1.41E-01
RN-219	Not Detected	---	3.48E-01
PB-211	Not Detected	---	8.04E-01
TL-207	Not Detected	---	1.33E+01
AM-241	Not Detected	---	1.32E-01
PU-239	Not Detected	---	2.97E+02
NP-237	Not Detected	---	2.29E-01
PA-233	Not Detected	---	5.44E-02
TH-229	Not Detected	---	1.66E-01

[Summary Report] - Sample ID: : 80159002

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.91E-02
AG-110m	Not Detected	---------	4.43E-02
BA-133	Not Detected	---------	5.21E-02
BE-7	Not Detected	---------	2.46E-01
CD-109	~~1.41E+00~~	~~4.15E-01~~	5.71E-01 Not detected 8/4/98
CD-115	Not Detected	---------	2.11E-01
CE-139	Not Detected	---------	2.39E-02
CE-141	Not Detected	---------	4.23E-02
CE-144	Not Detected	---------	1.74E-01
CO-56	Not Detected	---------	3.19E-02
CO-57	Not Detected	---------	2.02E-02
CO-58	Not Detected	---------	3.18E-02
CO-60	Not Detected	---------	3.65E-02
CR-51	Not Detected	---------	2.29E-01
CS-134	Not Detected	---------	4.52E-02
CS-137	1.42E-01	4.41E-02	2.41E-02
EU-152	Not Detected	---------	6.05E-02
EU-154	Not Detected	---------	1.82E-01
EU-155	Not Detected	---------	9.34E-02
FE-59	Not Detected	---------	7.88E-02
GD-153	Not Detected	---------	6.73E-02
HG-203	Not Detected	---------	2.89E-02
I-131	Not Detected	---------	3.49E-02
IR-192	Not Detected	---------	2.57E-02
K-40	1.97E+01	2.92E+00	2.21E-01
KR-85	Not Detected	---------	7.52E+00
MN-52	Not Detected	---------	4.72E-02
MN-54	Not Detected	---------	3.23E-02
MO-99	Not Detected	---------	5.91E-01
NA-22	Not Detected	---------	4.40E-02
NA-24	Not Detected	---------	2.60E+00
NB-95	Not Detected	---------	3.03E-01
ND-147	Not Detected	---------	2.28E-01
NI-57	Not Detected	---------	2.94E-01
NP-239	Not Detected	---------	8.40E-02
RU-103	Not Detected	---------	2.73E-02
RU-106	Not Detected	---------	2.70E-01
SB-122	Not Detected	---------	1.04E-01
SB-124	Not Detected	---------	2.85E-02
SB-125	Not Detected	---------	7.63E-02
SN-113	Not Detected	---------	3.42E-02
TA-182	Not Detected	---------	1.56E-01
TA-183	Not Detected	---------	1.94E-01
TC-99m	Not Detected	---------	1.51E+03
TL-201	Not Detected	---------	1.87E-01
XE-133	Not Detected	---------	2.50E-01
Y-88	Not Detected	---------	2.68E-02
ZN-65	Not Detected	---------	1.04E-01
ZR-95	Not Detected	---------	5.80E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
8-04-98 5:57:14 PM

* Analyzed by: 8/5/98 Reviewed by: S.B. Shade 8/6/98

Customer : C.BYRD/TMAC (6134/SMO)
Customer Sample ID : 041921-003
Lab Sample ID : 80159105

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 858.000 gram
Sample Date/Time : 7-31-98 10:45:00 AM
Acquire Start Date/Time : 8-04-98 4:14:33 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	2.85E+00
TH-234	Not Detected	---------	6.75E-01
RA-226	1.12E+00	5.14E-01	4.61E-01
PB-214	4.67E-01	1.01E-01	3.81E-02
BI-214	4.56E-01	9.23E-02	3.71E-02
PB-210	Not Detected	---------	2.99E+01
TH-232	7.06E-01	3.72E-01	1.32E-01
RA-228	6.94E-01	2.32E-01	1.41E-01
AC-228	7.62E-01	1.89E-01	9.83E-02
TH-228	6.37E-01	2.12E-01	4.08E-01
RA-224	6.97E-01	2.18E-01	5.89E-02
PB-212	7.42E-01	1.70E-01	3.89E-02
BI-212	7.70E-01	3.62E-01	2.58E-01
TL-208	6.37E-01	1.22E-01	5.61E-02
U-235	Not Detected	---------	2.08E-01
TH-231	Not Detected	---------	2.00E+00
PA-231	Not Detected	---------	3.33E+00
TH-227	Not Detected	---------	3.09E-01
RA-223	Not Detected	---------	2.15E-01
RN-219	Not Detected	---------	3.26E-01
PB-211	Not Detected	---------	7.28E-01
TL-207	Not Detected	---------	1.25E+01
AM-241	Not Detected	---------	4.08E-01
PU-239	Not Detected	---------	3.99E+02
NP-237	Not Detected	---------	2.26E-01
PA-233	Not Detected	---------	4.83E-02
TH-229	Not Detected	---------	2.24E-01

[Summary Report] - Sample ID: : 80159105

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected		3.57E-02
AG-110m	Not Detected		2.81E-02
BA-133	Not Detected		5.35E-02
BE-7	1.09E-01	1.12E-01	1.37E-01
CD-109	Not Detected		7.70E-01
CD-115	Not Detected		2.12E-01
CE-139	Not Detected		2.58E-02
CE-141	Not Detected		5.03E-02
CE-144	Not Detected		2.16E-01
CO-56	Not Detected		2.93E-02
CO-57	Not Detected		2.63E-02
CO-58	Not Detected		2.93E-02
CO-60	Not Detected		3.31E-02
CR-51	Not Detected		2.20E-01
CS-134	Not Detected		3.71E-02
CS-137	Not Detected		3.05E-02
EU-152	Not Detected		7.84E-02
EU-154	Not Detected		1.64E-01
EU-155	Not Detected		1.32E-01
FE-59	Not Detected		7.19E-02
GD-153	Not Detected		9.42E-02
HG-203	Not Detected		2.80E-02
I-131	Not Detected		3.44E-02
IR-192	Not Detected		2.34E-02
K-40	2.03E+01	2.92E+00	2.11E-01
KR-85	Not Detected		7.24E+00
MN-52	Not Detected		4.23E-02
MN-54	Not Detected		3.09E-02
MO-99	Not Detected		6.03E-01
NA-22	Not Detected		3.71E-02
NA-24	Not Detected		3.24E+00
NB-95	Not Detected		3.22E-01
ND-147	Not Detected		2.25E-01
NI-57	Not Detected		3.02E-01
NP-239	Not Detected		1.19E-01
RU-103	Not Detected		2.61E-02
RU-106	Not Detected		2.43E-01
SB-122	Not Detected		1.01E-01
SB-124	Not Detected		2.45E-02
SB-125	Not Detected		6.60E-02
SN-113	Not Detected		3.29E-02
TA-182	Not Detected		1.29E-01
TA-183	Not Detected		6.20E-01
TC-99m	Not Detected		3.45E+03
TL-201	Not Detected		4.17E-01
XE-133	Not Detected		4.70E-01
Y-88	Not Detected		2.00E-02
ZN-65	Not Detected		8.83E-02
ZR-95	Not Detected		5.27E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 8-05-98 9:07:26 AM *
****

* Analyzed by: 8/5/98 Reviewed by: S.B. Ebata 8/6/98 *

Customer : C.BYRD/TMAC (6134/SMO)
Customer Sample ID : 041922-003
Lab Sample ID : 80159106

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 842.000 gram
Sample Date/Time : 7-31-98 11:00:00 AM
Acquire Start Date/Time : 8-04-98 5:59:23 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.81E+00
TH-234	8.20E-01	4.06E-01	5.68E-01
RA-226	1.16E+00	4.95E-01	5.02E-01
PB-214	4.50E-01	8.92E-02	3.53E-02
BI-214	4.12E-01	9.45E-02	3.83E-02
PB-210	Not Detected	---	2.97E+01
TH-232	6.24E-01	3.10E-01	1.21E-01
RA-228	7.09E-01	2.07E-01	1.30E-01
AC-228	7.11E-01	1.77E-01	1.01E-01
TH-228	6.55E-01	2.37E-01	4.51E-01
RA-224	6.22E-01	1.93E-01	6.08E-02
PB-212	6.07E-01	1.46E-01	3.86E-02
BI-212	7.71E-01	3.11E-01	2.93E-01
TL-208	6.50E-01	1.40E-01	5.42E-02
U-235	~~1.34E-01~~	~~1.74E-01~~	2.03E-01 Not detected 8/5/98
TH-231	Not Detected	---	2.01E+00
PA-231	Not Detected	---	3.31E+00
TH-227	Not Detected	---	2.95E-01
RA-223	Not Detected	---	2.21E-01
RN-219	Not Detected	---	3.26E-01
PB-211	Not Detected	---	7.21E-01
TL-207	Not Detected	---	1.18E+01
AM-241	Not Detected	---	3.96E-01
PU-239	Not Detected	---	3.86E+02
NP-237	Not Detected	---	2.81E-01
PA-233	Not Detected	---	4.99E-02
TH-229	Not Detected	---	2.14E-01

[Summary Report] - Sample ID: : 80159106

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.55E-02
AG-110m	Not Detected	---	2.89E-02
BA-133	Not Detected	---	5.22E-02
BE-7	Not Detected	---	2.38E-01
CD-109	~~1.10E+00~~	~~4.93E-01~~	9.56E-01
CD-115	Not Detected	---	2.12E-01
CE-139	Not Detected	---	2.60E-02
CE-141	Not Detected	---	4.98E-02
CE-144	Not Detected	---	2.14E-01
CO-56	Not Detected	---	3.02E-02
CO-57	Not Detected	---	2.65E-02
CO-58	Not Detected	---	2.92E-02
CO-60	Not Detected	---	3.17E-02
CR-51	Not Detected	---	2.20E-01
CS-134	Not Detected	---	3.74E-02
CS-137	2.55E-02	7.16E-03	1.99E-02
EU-152	Not Detected	---	7.92E-02
EU-154	Not Detected	---	1.64E-01
EU-155	Not Detected	---	1.31E-01
FE-59	Not Detected	---	7.62E-02
GD-153	Not Detected	---	9.33E-02
HG-203	Not Detected	---	2.86E-02
I-131	Not Detected	---	3.52E-02
IR-192	Not Detected	---	2.40E-02
K-40	2.07E+01	2.96E+00	2.10E-01
KR-85	Not Detected	---	6.86E+00
MN-52	Not Detected	---	3.92E-02
MN-54	Not Detected	---	3.06E-02
MO-99	Not Detected	---	6.03E-01
NA-22	Not Detected	---	4.05E-02
NA-24	Not Detected	---	3.53E+00
NB-95	Not Detected	---	3.11E-01
ND-147	Not Detected	---	2.24E-01
NI-57	Not Detected	---	2.90E-01
NP-239	Not Detected	---	1.17E-01
RU-103	Not Detected	---	2.55E-02
RU-106	Not Detected	---	2.52E-01
SB-122	Not Detected	---	1.01E-01
SB-124	Not Detected	---	2.56E-02
SB-125	Not Detected	---	6.79E-02
SN-113	Not Detected	---	3.12E-02
TA-182	Not Detected	---	1.34E-01
TA-183	Not Detected	---	6.03E-01
TC-99m	Not Detected	---	3.84E+03
TL-201	Not Detected	---	4.11E-01
XE-133	Not Detected	---	4.81E-01
Y-88	Not Detected	---	2.14E-02
ZN-65	Not Detected	---	9.02E-02
ZR-95	Not Detected	---	5.27E-02

Not detected
8/5/98

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 8-04-98 9:26:58 PM *
****

* Analyzed by: 8/5/98 Reviewed by: S. B. Ebara 8/6/98 *

Customer : C.BYRD/TMAC (6134/SMO)
Customer Sample ID : 041923-003
Lab Sample ID : 80159107

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 873.000 gram
Sample Date/Time : 7-31-98 11:15:00 AM
Acquire Start Date/Time : 8-04-98 7:44:12 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.87E+00
TH-234	9.76E-01	3.88E-01	5.15E-01
RA-226	1.31E+00	6.11E-01	5.09E-01
PB-214	4.85E-01	3.32E-01	3.88E-02
BI-214	4.39E-01	1.59E-01	3.87E-02
PB-210	Not Detected	---	2.90E+01
TH-232	7.79E-01	3.80E-01	1.22E-01
RA-228	8.58E-01	2.45E-01	1.29E-01
AC-228	7.99E-01	4.09E-01	9.76E-02
TH-228	7.53E-01	2.37E-01	4.36E-01
RA-224	7.54E-01	2.36E-01	6.02E-02
PB-212	7.49E-01	1.73E-01	3.90E-02
BI-212	8.17E-01	7.95E-01	2.69E-01
TL-208	7.08E-01	1.49E-01	5.58E-02
U-235	Not Detected	---	1.99E-01
TH-231	Not Detected	---	1.95E+00
PA-231	Not Detected	---	3.29E+00
TH-227	Not Detected	---	3.11E-01
RA-223	Not Detected	---	2.23E-01
RN-219	Not Detected	---	3.19E-01
PB-211	Not Detected	---	7.32E-01
TL-207	Not Detected	---	1.19E+01
AM-241	Not Detected	---	4.01E-01
PU-239	Not Detected	---	3.93E+02
NP-237	~~3.88E-01~~	~~1.44E-01~~	2.48E-01 not detected
PA-233	Not Detected	---	4.84E-02
TH-229	Not Detected	---	2.21E-01

8/5/98

[Summary Report] - Sample ID: : 80159107

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.51E-02
AG-110m	Not Detected	---	2.64E-02
BA-133	Not Detected	---	5.36E-02
BE-7	6.96E-02	8.30E-02	1.25E-01
CD-109	Not Detected	---	8.45E-01
CD-115	Not Detected	---	2.26E-01
CE-139	Not Detected	---	2.55E-02
CE-141	Not Detected	---	4.94E-02
CE-144	Not Detected	---	2.11E-01
CO-56	Not Detected	---	3.08E-02
CO-57	Not Detected	---	2.64E-02
CO-58	Not Detected	---	2.98E-02
CO-60	Not Detected	---	3.10E-02
CR-51	Not Detected	---	2.15E-01
CS-134	Not Detected	---	3.76E-02
CS-137	Not Detected	---	2.87E-02
EU-152	Not Detected	---	7.87E-02
EU-154	Not Detected	---	1.62E-01
EU-155	Not Detected	---	1.33E-01
FE-59	Not Detected	---	6.77E-02
GD-153	Not Detected	---	9.51E-02
HG-203	Not Detected	---	2.99E-02
I-131	Not Detected	---	3.61E-02
IR-192	Not Detected	---	2.33E-02
K-40	2.05E+01	2.94E+00	2.06E-01
KR-85	Not Detected	---	7.23E+00
MN-52	Not Detected	---	4.74E-02
MN-54	Not Detected	---	3.12E-02
MO-99	Not Detected	---	6.20E-01
NA-22	Not Detected	---	4.14E-02
NA-24	Not Detected	---	3.58E+00
NB-95	Not Detected	---	3.32E-01
ND-147	Not Detected	---	2.21E-01
NI-57	Not Detected	---	1.76E-01
NP-239	Not Detected	---	1.20E-01
RU-103	Not Detected	---	2.58E-02
RU-106	Not Detected	---	2.43E-01
SB-122	Not Detected	---	1.01E-01
SB-124	Not Detected	---	2.58E-02
SB-125	Not Detected	---	6.91E-02
SN-113	Not Detected	---	3.12E-02
TA-182	Not Detected	---	1.30E-01
TA-183	Not Detected	---	6.34E-01
TC-99m	Not Detected	---	4.68E+03
TL-201	Not Detected	---	4.18E-01
XE-133	Not Detected	---	4.96E-01
Y-88	Not Detected	---	1.95E-02
ZN-65	Not Detected	---	8.75E-02
ZR-95	Not Detected	---	4.99E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 8-04-98 11:11:57 PM *
****

* Analyzed by: 8/5/98 Reviewed by: S.B. Ebara 8/6/98 *

Customer : C.BYRD/TMAC (6134/SMO)
Customer Sample ID : 041924-003
Lab Sample ID : 80159108

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 755.000 gram
Sample Date/Time : 7-31-98 11:30:00 AM
Acquire Start Date/Time : 8-04-98 9:29:07 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.28E+00
TH-234	1.38E+00	5.59E-01	5.87E-01
RA-226	1.66E+00	7.45E-01	5.28E-01
PB-214	6.26E-01	1.13E-01	4.58E-02
BI-214	5.83E-01	1.15E-01	4.39E-02
PB-210	Not Detected	---	3.34E+01
TH-232	8.26E-01	4.13E-01	1.44E-01
RA-228	8.37E-01	2.63E-01	1.51E-01
AC-228	9.11E-01	2.08E-01	1.11E-01
TH-228	6.75E-01	2.35E-01	4.65E-01
RA-224	8.67E-01	3.01E-01	6.20E-02
PB-212	8.76E-01	1.48E-01	4.33E-02
BI-212	8.33E-01	2.96E-01	2.72E-01
TL-208	7.06E-01	1.39E-01	6.19E-02
U-235	Not Detected	---	2.23E-01
TH-231	Not Detected	---	2.17E+00
PA-231	Not Detected	---	3.72E+00
TH-227	Not Detected	---	3.53E-01
RA-223	Not Detected	---	2.55E-01
RN-219	Not Detected	---	3.58E-01
PB-211	Not Detected	---	8.24E-01
TL-207	Not Detected	---	1.26E+01
AM-241	Not Detected	---	4.62E-01
PU-239	Not Detected	---	4.27E+02
NP-237	Not Detected	---	2.62E-01
PA-233	Not Detected	---	5.49E-02
TH-229	Not Detected	---	2.44E-01

[Summary Report] - Sample ID: : 80159108

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.89E-02
AG-110m	Not Detected	---------	3.06E-02
BA-133	Not Detected	---------	6.19E-02
BE-7	Not Detected	---------	2.61E-01
CD-109	1.58E+00	5.97E-01	8.94E-01
CD-115	Not Detected	---------	2.58E-01
CE-139	Not Detected	---------	2.91E-02
CE-141	Not Detected	---------	5.49E-02
CE-144	Not Detected	---------	2.35E-01
CO-56	Not Detected	---------	3.24E-02
CO-57	Not Detected	---------	2.93E-02
CO-58	Not Detected	---------	3.14E-02
CO-60	Not Detected	---------	3.51E-02
CR-51	Not Detected	---------	2.49E-01
CS-134	Not Detected	---------	4.49E-02
CS-137	1.57E-02	1.13E-02	1.95E-02
EU-152	Not Detected	---------	8.75E-02
EU-154	Not Detected	---------	1.79E-01
EU-155	Not Detected	---------	1.43E-01
FE-59	Not Detected	---------	7.25E-02
GD-153	Not Detected	---------	1.02E-01
HG-203	Not Detected	---------	3.22E-02
I-131	Not Detected	---------	3.81E-02
IR-192	Not Detected	---------	2.72E-02
K-40	1.70E+01	2.50E+00	2.24E-01
KR-85	Not Detected	---------	7.74E+00
MN-52	Not Detected	---------	5.04E-02
MN-54	Not Detected	---------	1.66E-02
MO-99	Not Detected	---------	7.06E-01
NA-22	Not Detected	---------	3.95E-02
NA-24	Not Detected	---------	3.88E+00
NB-95	Not Detected	---------	3.81E-01
ND-147	Not Detected	---------	2.39E-01
NI-57	Not Detected	---------	1.87E-01
NP-239	Not Detected	---------	1.29E-01
RU-103	Not Detected	---------	2.86E-02
RU-106	Not Detected	---------	2.66E-01
SB-122	4.99E-02	7.89E-02	6.15E-02
SB-124	Not Detected	---------	2.92E-02
SB-125	Not Detected	---------	7.70E-02
SN-113	Not Detected	---------	3.44E-02
TA-182	Not Detected	---------	1.41E-01
TA-183	Not Detected	---------	7.33E-01
TC-99m	Not Detected	---------	6.25E+03
TL-201	Not Detected	---------	4.83E-01
XE-133	Not Detected	---------	5.58E-01
Y-88	Not Detected	---------	2.53E-02
ZN-65	Not Detected	---------	9.78E-02
ZR-95	Not Detected	---------	5.95E-02

Not detected 8/5/98

Not detected 8/5/98

Feature 8DDD

SF 2001-COC (9-94) 500505

AND CHAIN OF CUSTODY

PAGE 1 OF 2

AR/COC- 03859

Dept. No./Mail Stop: 7585
Project/Task Manager: mike Young
Project Name: ADS 1332 scoping Samp
Record Center Code:
Logbook Ref No: pg-22
SMO Reference No.: SF-0103

Date Samples Shipped: 6-30
Lab Carrier/Waybill No.: FAC

FOR LAB USE

Lab Contact: Amir Mohagheghi
Lab Destination: SNL 7715
SMO Contact/Phone: Mack
Send Report to SMO Deborah McLaughlin

Contract No.: NA
Case No.: 3628.600
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec

Location
Tech Area ER site 8
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type		Lab Sample ID
248401	09-GR-001-0-SS	0	08	6-29-95 1433	S	P	500 ml	None	G	SA	X	
248402	002			1430								
248403	003			1428								
248404	004			1425								
248405	005			1422								
248406	006			1420								
248407	007			1418								
248408	008			1415								
248409	009			1410								
248501	010			1400								

LAB USE

MMA ☐ Yes ☒ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking — LAB USE
Date Entered (mm/dd/yy)
Entered by
QC Initials

Special Instructions/QC Requirements

Abnormal Conditions on Receipt — LAB USE

Sampler(s) Name	Signature	Init	Company/Organization
J. Boyd	J. Boyd	JB	FT/ 7584

Relinquished by	Org. FT/7584	Date 6-29-95	Time 1645	4. Relinquished by	Org. 7313	Date 7/13/95	Time 0700
Received by	Org. SMO 7513	Date 6-29-95	Time 1645	4. Received by	Org. 7584	Date 7/13/95	Time 0700
Relinquished by	Org. SMO 7573	Date 6-30-95	Time 0951	5. Relinquished by	Org.	Date	Time
Received by	Org. 7715	Date 6-30-95	Time 0951	5. Received by	Org.	Date	Time
Relinquished by	Org. SNL 7715	Date 7/11/95	Time 1700	6. Relinquished by	Org.	Date	Time
Received by	Org. SMO 7573	Date 7-11-95	Time 1700	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

2001-COD (9-94)

REQUEST AND CHAIN OF CUSTODY

PAGE 2 OF 2

AR/COC- 03862 03859

AMIR

Project Name: ADS 1332 Scoping sampling Project/Task Manager: Mike Young Case No.: 3628.600

Location Tech Area ER Site 58

Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Parameter & Method Requested	Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	
248521-01	08-GR 011 0-5S	0	58	6-29-95 1358	S	P	500 ml	None	G	SA	X	LAB USE
248523-01	012			1350 1345							X	
248524-01	013			1345							X	
248525-01	014			1340							X	

Normal Conditions on Receipt

Recipient Initials

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 7585
Project Location: ER site 8
Phone: 848-0389
Date Results Needed: ~~7-8-95~~ 7/15/95
Suspect Isotopes: unknown
Other Information: 03859

Hazards/Special Instructions:

Batch Log Number: 500505
Logged By: AHM

Analysis Type:
- [X] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
024841 -1	soil	6/29/95 1433	500ml	Gamma spec	01	<300	1100g	
024842- 1		1430			02		1023g	
024843- 1		1428			03		954g	
024844 -1		1425			04		1009g	
024845- 1		1422			05		735g	
024846-1		1420			06		788g	
024847-1		1418			07		878g	
024848 -1		1415			08		895g	
024849-1		1410			09		856g	
024850-1		1400			10		1021g	
024852-1		1358			11		749g	
024853-1		1350			12		666g	
024854-1		1345			13		671g	
024855-1		1340			14		953g	
					15 (& LCS)			

Relinquished by _____ Date 6-30-95 Time 0951 Received by _____ Date 6/30/95 Time 0951
Relinquished by _____ Date 7/11/95 Time 1700 Received by _____ Date 7-11-95 Time 1700
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

ER/1332 008/DAT

SMO ANALYTICAL DATA ROUTING FORM

Project Name: ADS 1332 Case Number: 36286.00

SNL Task Leader: Young Org/Mail Stop: 7585

SMO Project Coordinator: Puissant Sample Ship Date: 6/30/95

ARCOC	Lab	Lab ID
03859	SNL 7715	500505

Date Results Received:

Preliminary: _____ Final: 7/11/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

COPY
ORIGINAL FILED IN RECORDS CENTER BY SMO _____ (Initials) _____ (Date)

Date Assigned to SMO Reviewer: _____ Reviewer: _____

Date Review Complete: _____ Signature: _____

Date of Preliminary Notification: _____ Person Notified: _____

Date of Final Transmittal: 7/18/95 Transmitted To: Young

Transmitted By: WDSM Filed In Record Center: _____

Comments: _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-07-95 7:02:36 PM

Analyzed by: [signature] 7/11/95 Reviewed by: [signature] 7/11/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024841-1
Lab Sample ID : 50050501

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 1100.000 gram
Sample Date/Time : 6-29-95 2:33:00 PM
Acquire Start Date : 7-07-95 6:25:14 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.14
TH-234	Not Detected	--------	9.60E-01
U-234	Not Detected	--------	1.53E+01
RA-226	Not Detected	--------	9.15E-01
PB-214	3.88E-01	8.09E-02	6.66E-02
BI-214	3.70E-01	7.65E-02	6.35E-02
PB-210	Not Detected	--------	3.85E+02
TH-232	4.06E-01	1.83E-01	2.53E-01
RA-228	6.31E-01	2.17E-01	1.67E-01
AC-228	Not Detected	--------	2.57E-01
TH-228	Not Detected	--------	9.67E-01
RA-224	1.09	3.26E-01	5.59E-01
PB-212	5.64E-01	1.30E-01	4.86E-02
BI-212	7.60E-01	3.34E-01	4.42E-01
TL-208	4.63E-01	1.12E-01	1.12E-01
U-235	Not Detected	--------	3.06E-01
TH-231	Not Detected	--------	7.32E-01
PA-231	Not Detected	--------	1.33
AC-227	Not Detected	--------	2.22
TH-227	Not Detected	--------	4.32E-01
RA-223	Not Detected	--------	3.80E-01
RN-219	Not Detected	--------	3.56E-01
PB-211	Not Detected	--------	8.47E-01
TL-207	Not Detected	--------	1.75E+01
AM-241	Not Detected	--------	6.83E-01
PU-239	Not Detected	--------	3.68E+02
NP-237	Not Detected	--------	4.67E-01
PA-233	Not Detected	--------	7.56E-02
TH-229	Not Detected	--------	3.59E-01

[Summary Report] - Sample ID: 50050501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.21E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.96E-02
BA-140	Not Detected	--------	2.18E-01
CD-109	Not Detected	--------	1.58
CD-115	Not Detected	--------	1.00
CE-139	Not Detected	--------	3.93E-02
CE-141	Not Detected	--------	7.94E-02
CE-144	Not Detected	--------	3.17E-01
CO-56	Not Detected	--------	4.52E-02
CO-57	Not Detected	--------	4.02E-02
CO-58	Not Detected	--------	4.15E-02
CO-60	Not Detected	--------	4.98E-02
CR-51	Not Detected	--------	3.57E-01
CS-134	Not Detected	--------	5.86E-02
CS-137	2.79E-01	5.36E-02	4.26E-02
CU-64	Not Detected	--------	4.14E+05
EU-152	Not Detected	--------	3.03E-01
EU-154	Not Detected	--------	2.31E-01
EU-155	Not Detected	--------	1.85E-01
FE-59	Not Detected	--------	1.06E-01
GD-153	Not Detected	--------	1.43E-01
HG-203	Not Detected	--------	4.12E-02
I-131	Not Detected	--------	7.15E-02
IN-115m	Not Detected	--------	1.15E+12
IR-192	Not Detected	--------	3.76E-02
K-40	1.67E+01	2.38	3.74E-01
LA-140	Not Detected	--------	1.33
MN-54	Not Detected	--------	4.46E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	2.41
NA-22	Not Detected	--------	5.53E-02
NA-24	Not Detected	--------	3.65E+02
NB-95	Not Detected	--------	9.35E-01
ND-147	Not Detected	--------	4.39E-01
NI-57	Not Detected	--------	2.38
BE-7	Not Detected	--------	3.76E-01
RU-103	Not Detected	--------	4.20E-02
RU-106	Not Detected	--------	3.98E-01
SB-122	Not Detected	--------	3.90E-01
SB-124	Not Detected	--------	4.22E-02
SB-125	Not Detected	--------	1.05E-01
SC-46	Not Detected	--------	7.24E-02
SR-85	Not Detected	--------	4.80E-02
TA-182	Not Detected	--------	2.09E-01
TA-183	Not Detected	--------	1.79
TE-132	Not Detected	--------	1.98E-01
TL-201	Not Detected	--------	1.31
XE-133	Not Detected	--------	2.08
Y-88	Not Detected	--------	3.13E-02
ZN-65	Not Detected	--------	1.30E-01
ZR-95	Not Detected	--------	8.53E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-07-95 7:47:00 PM

Analyzed by: [signature] 7/11/95 Reviewed by: [signature] 7/11/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024842-1
Lab Sample ID : 50050502

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 1023.000 gram
Sample Date/Time : 6-29-95 2:30:00 PM
Acquire Start Date : 7-07-95 7:13:23 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.39
TH-234	Not Detected	--------	9.66E-01
U-234	Not Detected	--------	1.75E+01
RA-226	Not Detected	--------	9.75E-01
PB-214	4.67E-01	9.58E-02	7.92E-02
BI-214	3.51E-01	7.87E-02	7.38E-02
PB-210	Not Detected	--------	4.14E+02
TH-232	3.84E-01	2.39E-01	3.60E-01
RA-228	3.70E-01	2.11E-01	3.07E-01
AC-228	Not Detected	--------	2.70E-01
TH-228	6.40E-01	2.51E-01	6.36E-01
RA-224	1.29	3.53E-01	5.48E-01
PB-212	5.75E-01	1.25E-01	5.73E-02
BI-212	4.03E-01	2.79E-01	4.10E-01
TL-208	5.02E-01	1.25E-01	1.32E-01
U-235	Not Detected	--------	3.17E-01
TH-231	Not Detected	--------	7.62E-01
PA-231	Not Detected	--------	1.41
AC-227	Not Detected	--------	2.21
TH-227	Not Detected	--------	4.60E-01
RA-223	Not Detected	--------	4.04E-01
RN-219	Not Detected	--------	3.64E-01
PB-211	Not Detected	--------	8.38E-01
TL-207	Not Detected	--------	2.01E+01
AM-241	Not Detected	--------	7.02E-01
PU-239	Not Detected	--------	3.56E+02
NP-237	Not Detected	--------	4.86E-01
PA-233	Not Detected	--------	7.92E-02
TH-229	Not Detected	--------	3.67E-01

[Summary Report] - Sample ID: 50050502

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	5.91E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	7.46E-02
BA-140	Not Detected	--------	2.18E-01
CD-109	Not Detected	--------	1.66
CD-115	Not Detected	--------	1.06
CE-139	Not Detected	--------	3.94E-02
CE-141	Not Detected	--------	8.48E-02
CE-144	Not Detected	--------	3.34E-01
CO-56	Not Detected	--------	4.94E-02
CO-57	Not Detected	--------	4.08E-02
CO-58	Not Detected	--------	4.46E-02
CO-60	Not Detected	--------	5.24E-02
CR-51	Not Detected	--------	3.73E-01
CS-134	Not Detected	--------	5.83E-02
CS-137	9.16E-02	3.24E-02	4.10E-02
CU-64	Not Detected	--------	4.63E+05
EU-152	Not Detected	--------	3.43E-01
EU-154	Not Detected	--------	2.38E-01
EU-155	Not Detected	--------	1.89E-01
FE-59	Not Detected	--------	1.22E-01
GD-153	Not Detected	--------	1.42E-01
HG-203	Not Detected	--------	4.31E-02
I-131	Not Detected	--------	7.10E-02
IN-115m	Not Detected	--------	1.38E+12
IR-192	Not Detected	--------	4.00E-02
K-40	2.07E+01	2.92	4.03E-01
LA-140	Not Detected	--------	1.34
MN-54	Not Detected	--------	4.74E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	2.51
NA-22	Not Detected	--------	5.83E-02
NA-24	Not Detected	--------	4.20E+02
NB-95	Not Detected	--------	1.00
ND-147	Not Detected	--------	4.23E-01
NI-57	Not Detected	--------	2.78
BE-7	Not Detected	--------	3.88E-01
RU-103	Not Detected	--------	4.29E-02
RU-106	Not Detected	--------	3.83E-01
SB-122	Not Detected	--------	4.24E-01
SB-124	Not Detected	--------	4.34E-02
SB-125	Not Detected	--------	1.11E-01
SC-46	Not Detected	--------	7.34E-02
SR-85	Not Detected	--------	5.24E-02
TA-182	Not Detected	--------	2.11E-01
TA-183	Not Detected	--------	1.85
TE-132	Not Detected	--------	2.01E-01
TL-201	Not Detected	--------	1.39
XE-133	Not Detected	--------	2.28
Y-88	Not Detected	--------	4.03E-02
ZN-65	Not Detected	--------	1.35E-01
ZR-95	Not Detected	--------	8.64E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 7-07-95 8:26:27 PM *
****
*
* Analyzed by: 7/11/95 Reviewed by: 7/11/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024843-1
Lab Sample ID : 50050503

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 954.000 gram
Sample Date/Time : 6-29-95 2:28:00 PM
Acquire Start Date : 7-07-95 7:53:02 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.62
TH-234	4.31E-01	4.87E-01	7.62E-01
U-234	Not Detected	--------	1.68E+01
RA-226	1.02	5.92E-01	8.83E-01
PB-214	4.93E-01	1.03E-01	8.92E-02
BI-214	3.72E-01	8.11E-02	7.09E-02
PB-210	Not Detected	--------	4.40E+02
TH-232	4.90E-01	1.78E-01	2.21E-01
RA-228	4.51E-01	2.04E-01	2.22E-01
AC-228	Not Detected	--------	2.87E-01
TH-228	3.57E-01	2.72E-01	6.83E-01
RA-224	1.15	3.01E-01	6.52E-01
PB-212	5.53E-01	1.08E-01	5.67E-02
BI-212	Not Detected	--------	7.80E-01
TL-208	4.48E-01	1.13E-01	1.13E-01
U-235	Not Detected	--------	3.42E-01
TH-231	Not Detected	--------	8.24E-01
PA-231	Not Detected	--------	1.49
AC-227	Not Detected	--------	2.52
TH-227	Not Detected	--------	4.75E-01
RA-223	Not Detected	--------	4.31E-01
RN-219	Not Detected	--------	3.98E-01
PB-211	Not Detected	--------	9.31E-01
TL-207	Not Detected	--------	2.18E+01
AM-241	Not Detected	--------	7.57E-01
PU-239	Not Detected	--------	3.94E+02
NP-237	Not Detected	--------	5.03E-01
PA-233	Not Detected	--------	8.84E-02
TH-229	Not Detected	--------	3.82E-01

[Summary Report] - Sample ID: 50050503

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.78E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	8.28E-02
BA-140	Not Detected	--------	2.40E-01
CD-109	Not Detected	--------	1.69
CD-115	Not Detected	--------	1.17
CE-139	Not Detected	--------	4.56E-02
CE-141	Not Detected	--------	9.05E-02
CE-144	Not Detected	--------	3.43E-01
CO-56	Not Detected	--------	5.46E-02
CO-57	Not Detected	--------	4.56E-02
CO-58	Not Detected	--------	5.08E-02
CO-60	Not Detected	--------	5.59E-02
CR-51	Not Detected	--------	4.22E-01
CS-134	Not Detected	--------	6.45E-02
CS-137	3.99E-01	7.04E-02	4.68E-02
CU-64	Not Detected	--------	5.34E+05
EU-152	Not Detected	--------	3.75E-01
EU-154	Not Detected	--------	2.52E-01
EU-155	Not Detected	--------	1.95E-01
FE-59	Not Detected	--------	1.28E-01
GD-153	Not Detected	--------	1.55E-01
HG-203	Not Detected	--------	4.78E-02
I-131	Not Detected	--------	7.90E-02
IN-115m	Not Detected	--------	1.67E+12
IR-192	Not Detected	--------	4.44E-02
K-40	1.94E+01	2.78	4.92E-01
LA-140	Not Detected	--------	1.49
MN-54	Not Detected	--------	4.95E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	2.63
NA-22	Not Detected	--------	6.17E-02
NA-24	Not Detected	--------	4.74E+02
NB-95	Not Detected	--------	1.04
ND-147	Not Detected	--------	4.81E-01
NI-57	Not Detected	--------	3.18
BE-7	Not Detected	--------	4.23E-01
RU-103	Not Detected	--------	4.38E-02
RU-106	Not Detected	--------	4.41E-01
SB-122	Not Detected	--------	4.79E-01
SB-124	Not Detected	--------	4.82E-02
SB-125	Not Detected	--------	1.16E-01
SC-46	Not Detected	--------	7.71E-02
SR-85	Not Detected	--------	5.53E-02
TA-182	Not Detected	--------	2.22E-01
TA-183	Not Detected	--------	2.01
TE-132	Not Detected	--------	2.23E-01
TL-201	Not Detected	--------	1.49
XE-133	Not Detected	--------	2.48
Y-88	Not Detected	--------	4.15E-02
ZN-65	Not Detected	--------	1.48E-01
ZR-95	Not Detected	--------	9.27E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-07-95 9:06:50 PM

Analyzed by: Sharon J. Cole 7/11/95 Reviewed by: [illegible] 7/14/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024844-1
Lab Sample ID : 50050504

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 1009.000 gram
Sample Date/Time : 6-29-95 2:25:00 PM
Acquire Start Date : 7-07-95 8:33:02 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.62
TH-234	Not Detected	--------	1.07
U-234	Not Detected	--------	1.80E+01
RA-226	6.47E-01	6.65E-01	1.06
PB-214	4.99E-01	1.01E-01	8.15E-02
BI-214	4.42E-01	8.92E-02	7.25E-02
PB-210	Not Detected	--------	4.68E+02
TH-232	5.13E-01	2.30E-01	3.20E-01
RA-228	6.14E-01	2.10E-01	2.50E-01
AC-228	Not Detected	--------	2.90E-01
TH-228	4.43E-01	2.89E-01	7.37E-01
RA-224	1.53	3.97E-01	5.92E-01
PB-212	7.21E-01	1.41E-01	5.23E-02
BI-212	7.89E-01	3.59E-01	4.80E-01
TL-208	6.61E-01	2.00E-01	8.20E-02
U-235	Not Detected	--------	3.52E-01
TH-231	Not Detected	--------	8.30E-01
PA-231	Not Detected	--------	1.56
AC-227	Not Detected	--------	2.55
TH-227	Not Detected	--------	5.12E-01
RA-223	Not Detected	--------	4.34E-01
RN-219	Not Detected	--------	4.04E-01
PB-211	Not Detected	--------	9.92E-01
TL-207	Not Detected	--------	1.93E+01
AM-241	Not Detected	--------	7.96E-01
PU-239	Not Detected	--------	4.17E+02
NP-237	Not Detected	--------	5.38E-01
PA-233	Not Detected	--------	8.78E-02
TH-229	Not Detected	--------	4.00E-01

[Summary Report] - Sample ID: 50050504

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.06E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	8.21E-02
BA-140	Not Detected	--------	2.31E-01
CD-109	Not Detected	--------	1.90
CD-115	Not Detected	--------	1.22
CE-139	Not Detected	--------	4.73E-02
CE-141	Not Detected	--------	9.40E-02
CE-144	Not Detected	--------	3.70E-01
CO-56	Not Detected	--------	4.81E-02
CO-57	Not Detected	--------	4.65E-02
CO-58	Not Detected	--------	4.85E-02
CO-60	Not Detected	--------	5.80E-02
CR-51	Not Detected	--------	4.12E-01
CS-134	Not Detected	--------	6.93E-02
CS-137	6.60E-01	1.04E-01	5.81E-02
CU-64	Not Detected	--------	5.04E+05
EU-152	Not Detected	--------	3.44E-01
EU-154	Not Detected	--------	2.54E-01
EU-155	Not Detected	--------	2.05E-01
FE-59	Not Detected	--------	1.22E-01
GD-153	Not Detected	--------	1.63E-01
HG-203	Not Detected	--------	5.04E-02
I-131	Not Detected	--------	8.88E-02
IN-115m	Not Detected	--------	1.93E+12
IR-192	Not Detected	--------	4.37E-02
K-40	1.96E+01	2.78	4.60E-01
LA-140	Not Detected	--------	1.60
MN-54	Not Detected	--------	5.02E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	2.86
NA-22	Not Detected	--------	6.34E-02
NA-24	Not Detected	--------	4.48E+02
NB-95	Not Detected	--------	1.13
ND-147	Not Detected	--------	4.57E-01
NI-57	Not Detected	--------	3.06
BE-7	Not Detected	--------	4.34E-01
RU-103	Not Detected	--------	4.89E-02
RU-106	Not Detected	--------	4.36E-01
SB-122	Not Detected	--------	4.50E-01
SB-124	Not Detected	--------	5.03E-02
SB-125	Not Detected	--------	1.21E-01
SC-46	Not Detected	--------	7.85E-02
SR-85	Not Detected	--------	5.48E-02
TA-182	Not Detected	--------	2.24E-01
TA-183	Not Detected	--------	2.12
TE-132	Not Detected	--------	2.26E-01
TL-201	Not Detected	--------	1.52
XE-133	Not Detected	--------	2.45
Y-88	Not Detected	--------	3.93E-02
ZN-65	Not Detected	--------	1.54E-01
ZR-95	Not Detected	--------	9.20E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-07-95 9:47:07 PM

* Analyzed by: 7/11/95 Reviewed by: 7/11/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024845-1
Lab Sample ID : 50050505

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 735.000 gram
Sample Date/Time : 6-29-95 2:22:00 PM
Acquire Start Date : 7-07-95 9:13:24 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.05
TH-234	Not Detected	--------	1.31
U-234	Not Detected	--------	2.17E+01
RA-226	6.49E-01	6.28E-01	9.91E-01
PB-214	6.35E-01	1.45E-01	1.47E-01
BI-214	5.70E-01	1.18E-01	9.83E-02
PB-210	Not Detected	--------	5.36E+02
TH-232	6.39E-01	2.70E-01	3.64E-01
RA-228	8.71E-01	3.03E-01	2.37E-01
AC-228	Not Detected	--------	3.62E-01
TH-228	9.25E-01	4.28E-01	8.93E-01
RA-224	1.64	4.68E-01	7.49E-01
PB-212	7.51E-01	1.88E-01	7.20E-02
BI-212	6.39E-01	3.73E-01	5.23E-01
TL-208	5.58E-01	1.37E-01	1.30E-01
U-235	Not Detected	--------	4.51E-01
TH-231	Not Detected	--------	9.73E-01
PA-231	Not Detected	--------	2.00
AC-227	Not Detected	--------	3.15
TH-227	Not Detected	--------	6.23E-01
RA-223	Not Detected	--------	5.13E-01
RN-219	Not Detected	--------	5.14E-01
PB-211	Not Detected	--------	1.25
TL-207	Not Detected	--------	2.60E+01
AM-241	Not Detected	--------	9.96E-01
PU-239	Not Detected	--------	4.87E+02
NP-237	Not Detected	--------	6.26E-01
PA-233	Not Detected	--------	1.17E-01
TH-229	Not Detected	--------	4.92E-01

[Summary Report] - Sample ID: 50050505

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.54E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	1.06E-01
BA-140	Not Detected	--------	3.19E-01
CD-109	Not Detected	--------	2.18
CD-115	Not Detected	--------	1.54
CE-139	Not Detected	--------	5.76E-02
CE-141	Not Detected	--------	1.19E-01
CE-144	Not Detected	--------	4.43E-01
CO-56	Not Detected	--------	6.91E-02
CO-57	Not Detected	--------	5.58E-02
CO-58	Not Detected	--------	5.99E-02
CO-60	Not Detected	--------	7.56E-02
CR-51	Not Detected	--------	5.26E-01
CS-134	Not Detected	--------	8.61E-02
CS-137	1.04	1.56E-01	5.97E-02
CU-64	Not Detected	--------	6.51E+05
EU-152	Not Detected	--------	4.46E-01
EU-154	Not Detected	--------	2.99E-01
EU-155	Not Detected	--------	2.68E-01
FE-59	Not Detected	--------	1.48E-01
GD-153	Not Detected	--------	1.96E-01
HG-203	Not Detected	--------	6.38E-02
I-131	Not Detected	--------	1.03E-01
IN-115m	Not Detected	--------	2.71E+12
IR-192	Not Detected	--------	5.76E-02
K-40	2.04E+01	2.97	5.91E-01
LA-140	Not Detected	--------	1.78
MN-54	Not Detected	--------	6.21E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	3.59
NA-22	Not Detected	--------	7.50E-02
NA-24	Not Detected	--------	5.94E+02
NB-95	Not Detected	--------	1.39
ND-147	Not Detected	--------	6.50E-01
NI-57	Not Detected	--------	3.89
BE-7	Not Detected	--------	5.65E-01
RU-103	Not Detected	--------	6.48E-02
RU-106	Not Detected	--------	5.22E-01
SB-122	Not Detected	--------	6.30E-01
SB-124	Not Detected	--------	5.98E-02
SB-125	Not Detected	--------	1.69E-01
SC-46	Not Detected	--------	9.92E-02
SR-85	Not Detected	--------	7.00E-02
TA-182	Not Detected	--------	2.89E-01
TA-183	Not Detected	--------	2.66
TE-132	Not Detected	--------	2.98E-01
TL-201	Not Detected	--------	1.98
XE-133	Not Detected	--------	3.05
Y-88	Not Detected	--------	6.01E-02
ZN-65	Not Detected	--------	1.78E-01
ZR-95	Not Detected	--------	1.08E-01

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 7-07-95 10:27:03 PM *
****
*
* Analyzed by: Jerry J Cole 7/11/95 Reviewed by: 7/11/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024846-1
Lab Sample ID : 50050506

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 788.000 gram
Sample Date/Time : 6-29-95 2:20:00 PM
Acquire Start Date : 7-07-95 9:53:30 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.75
TH-234	Not Detected	--------	1.29
U-234	Not Detected	--------	2.15E+01
RA-226	1.92	8.44E-01	1.19
PB-214	7.25E-01	1.37E-01	9.26E-02
BI-214	6.16E-01	1.26E-01	1.10E-01
PB-210	Not Detected	--------	5.43E+02
TH-232	7.59E-01	2.48E-01	2.91E-01
RA-228	7.26E-01	2.67E-01	2.28E-01
AC-228	Not Detected	--------	3.48E-01
TH-228	5.62E-01	3.71E-01	9.25E-01
RA-224	2.17	5.26E-01	6.97E-01
PB-212	9.22E-01	1.79E-01	7.04E-02
BI-212	1.08	5.11E-01	7.03E-01
TL-208	8.67E-01	1.87E-01	1.69E-01
U-235	Not Detected	--------	4.26E-01
TH-231	Not Detected	--------	9.92E-01
PA-231	Not Detected	--------	1.91
AC-227	Not Detected	--------	3.06
TH-227	Not Detected	--------	6.34E-01
RA-223	Not Detected	--------	5.14E-01
RN-219	Not Detected	--------	4.80E-01
PB-211	Not Detected	--------	1.12
TL-207	Not Detected	--------	2.55E+01
AM-241	Not Detected	--------	9.18E-01
PU-239	Not Detected	--------	4.68E+02
NP-237	Not Detected	--------	6.31E-01
PA-233	Not Detected	--------	1.02E-01
TH-229	Not Detected	--------	4.70E-01

[Summary Report] - Sample ID: 50050506

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.07E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	1.04E-01
BA-140	Not Detected	--------	2.85E-01
CD-109	Not Detected	--------	2.15
CD-115	Not Detected	--------	1.56
CE-139	Not Detected	--------	5.54E-02
CE-141	Not Detected	--------	1.12E-01
CE-144	Not Detected	--------	4.15E-01
CO-56	Not Detected	--------	6.49E-02
CO-57	Not Detected	--------	5.36E-02
CO-58	Not Detected	--------	6.04E-02
CO-60	Not Detected	--------	5.69E-02
CR-51	Not Detected	--------	5.05E-01
CS-134	Not Detected	--------	8.56E-02
CS-137	4.52E-01	8.07E-02	5.36E-02
CU-64	Not Detected	--------	6.78E+05
EU-152	Not Detected	--------	4.20E-01
EU-154	Not Detected	--------	3.26E-01
EU-155	Not Detected	--------	2.48E-01
FE-59	Not Detected	--------	1.26E-01
GD-153	Not Detected	--------	1.88E-01
HG-203	Not Detected	--------	5.67E-02
I-131	Not Detected	--------	1.01E-01
IN-115m	Not Detected	--------	3.02E+12
IR-192	Not Detected	--------	5.33E-02
K-40	1.84E+01	2.68	4.75E-01
LA-140	Not Detected	--------	2.14
MN-54	Not Detected	--------	6.04E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	3.46
NA-22	Not Detected	--------	7.41E-02
NA-24	Not Detected	--------	5.99E+02
NB-95	Not Detected	--------	1.40
ND-147	Not Detected	--------	5.94E-01
NI-57	Not Detected	--------	3.78
BE-7	Not Detected	--------	5.31E-01
RU-103	Not Detected	--------	5.94E-02
RU-106	Not Detected	--------	5.50E-01
SB-122	Not Detected	--------	5.93E-01
SB-124	Not Detected	--------	5.89E-02
SB-125	Not Detected	--------	1.43E-01
SC-46	Not Detected	--------	9.59E-02
SR-85	Not Detected	--------	7.23E-02
TA-182	Not Detected	--------	2.76E-01
TA-183	Not Detected	--------	2.46
TE-132	Not Detected	--------	2.80E-01
TL-201	Not Detected	--------	1.87
XE-133	Not Detected	--------	3.05
Y-88	Not Detected	--------	4.60E-02
ZN-65	Not Detected	--------	1.80E-01
ZR-95	Not Detected	--------	1.06E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-07-95 11:06:50 PM

Analyzed by: [signature] 7/11/95 Reviewed by: [signature] 7/11/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024847-1
Lab Sample ID : 50050507

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 878.000 gram
Sample Date/Time : 6-29-95 2:18:00 PM
Acquire Start Date : 7-07-95 10:33:04 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.97
TH-234	Not Detected	--------	1.17
U-234	Not Detected	--------	1.87E+01
RA-226	9.64E-01	6.55E-01	1.00
PB-214	6.16E-01	1.25E-01	1.05E-01
BI-214	4.80E-01	9.84E-02	8.11E-02
PB-210	Not Detected	--------	4.73E+02
TH-232	6.61E-01	2.17E-01	2.55E-01
RA-228	6.83E-01	2.28E-01	2.64E-01
AC-228	Not Detected	--------	3.05E-01
TH-228	6.07E-01	3.31E-01	7.55E-01
RA-224	Not Detected	--------	6.35E-01
PB-212	7.01E-01	1.42E-01	6.27E-02
BI-212	5.83E-01	3.41E-01	4.83E-01
TL-208	6.14E-01	1.51E-01	1.57E-01
U-235	Not Detected	--------	3.72E-01
TH-231	Not Detected	--------	9.04E-01
PA-231	Not Detected	--------	1.65
AC-227	Not Detected	--------	2.74
TH-227	Not Detected	--------	5.55E-01
RA-223	Not Detected	--------	4.64E-01
RN-219	Not Detected	--------	4.36E-01
PB-211	Not Detected	--------	1.01
TL-207	Not Detected	--------	2.11E+01
AM-241	Not Detected	--------	8.34E-01
PU-239	Not Detected	--------	4.31E+02
NP-237	Not Detected	--------	5.75E-01
PA-233	Not Detected	--------	9.44E-02
TH-229	Not Detected	--------	4.19E-01

[Summary Report] - Sample ID: 50050507

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.53E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	9.13E-02
BA-140	Not Detected	--------	2.46E-01
CD-109	Not Detected	--------	1.96
CD-115	Not Detected	--------	1.38
CE-139	Not Detected	--------	4.86E-02
CE-141	Not Detected	--------	1.00E-01
CE-144	Not Detected	--------	3.86E-01
CO-56	Not Detected	--------	5.75E-02
CO-57	Not Detected	--------	4.68E-02
CO-58	Not Detected	--------	5.69E-02
CO-60	Not Detected	--------	5.91E-02
CR-51	Not Detected	--------	4.46E-01
CS-134	Not Detected	--------	7.31E-02
CS-137	2.85E-01	5.71E-02	4.53E-02
CU-64	Not Detected	--------	6.41E+05
EU-152	Not Detected	--------	3.82E-01
EU-154	Not Detected	--------	2.88E-01
EU-155	Not Detected	--------	2.25E-01
FE-59	Not Detected	--------	1.31E-01
GD-153	Not Detected	--------	1.71E-01
HG-203	Not Detected	--------	5.19E-02
I-131	Not Detected	--------	8.72E-02
IN-115m	Not Detected	--------	2.94E+12
IR-192	Not Detected	--------	4.83E-02
K-40	2.12E+01	3.03	4.64E-01
LA-140	Not Detected	--------	1.77
MN-54	Not Detected	--------	5.58E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	3.23
NA-22	Not Detected	--------	6.68E-02
NA-24	Not Detected	--------	5.71E+02
NB-95	Not Detected	--------	1.25
ND-147	Not Detected	--------	5.35E-01
NI-57	Not Detected	--------	3.82
BE-7	Not Detected	--------	4.55E-01
RU-103	Not Detected	--------	4.94E-02
RU-106	Not Detected	--------	4.61E-01
SB-122	Not Detected	--------	4.95E-01
SB-124	Not Detected	--------	5.26E-02
SB-125	Not Detected	--------	1.27E-01
SC-46	Not Detected	--------	8.76E-02
SR-85	Not Detected	--------	5.94E-02
TA-182	Not Detected	--------	2.56E-01
TA-183	Not Detected	--------	2.24
TE-132	Not Detected	--------	2.48E-01
TL-201	Not Detected	--------	1.74
XE-133	Not Detected	--------	2.68
Y-88	Not Detected	--------	4.95E-02
ZN-65	Not Detected	--------	1.60E-01
ZR-95	Not Detected	--------	9.83E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-07-95 11:46:38 PM

* Analyzed by: [signature] 7/11/95 Reviewed by: [signature] 7/11/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024848-1
Lab Sample ID : 50050508

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 895.000 gram
Sample Date/Time : 6-29-95 2:15:00 PM
Acquire Start Date : 7-07-95 11:13:15 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.16
TH-234	Not Detected	--------	1.11
U-234	Not Detected	--------	1.76E+01
RA-226	Not Detected	--------	1.05
PB-214	4.86E-01	1.07E-01	1.01E-01
BI-214	4.42E-01	9.45E-02	8.36E-02
PB-210	Not Detected	--------	4.63E+02
TH-232	4.72E-01	1.97E-01	2.61E-01
RA-228	4.98E-01	2.09E-01	2.72E-01
AC-228	Not Detected	--------	3.07E-01
TH-228	Not Detected	--------	1.26
RA-224	1.30	3.88E-01	6.64E-01
PB-212	6.59E-01	1.38E-01	6.26E-02
BI-212	6.94E-01	3.78E-01	5.33E-01
TL-208	5.44E-01	1.22E-01	1.01E-01
U-235	Not Detected	--------	3.52E-01
TH-231	Not Detected	--------	8.98E-01
PA-231	Not Detected	--------	1.74
AC-227	Not Detected	--------	2.64
TH-227	Not Detected	--------	5.26E-01
RA-223	Not Detected	--------	4.69E-01
RN-219	Not Detected	--------	4.37E-01
PB-211	Not Detected	--------	9.86E-01
TL-207	Not Detected	--------	2.15E+01
AM-241	Not Detected	--------	8.66E-01
PU-239	Not Detected	--------	4.46E+02
NP-237	Not Detected	--------	5.57E-01
PA-233	Not Detected	--------	9.19E-02
TH-229	Not Detected	--------	4.14E-01

[Summary Report] - Sample ID: 50050508

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.02E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	8.40E-02
BA-140	Not Detected	--------	2.64E-01
CD-109	Not Detected	--------	1.27
CD-115	Not Detected	--------	1.23
CE-139	Not Detected	--------	4.69E-02
CE-141	Not Detected	--------	9.55E-02
CE-144	Not Detected	--------	3.93E-01
CO-56	Not Detected	--------	5.84E-02
CO-57	Not Detected	--------	4.63E-02
CO-58	Not Detected	--------	5.62E-02
CO-60	Not Detected	--------	5.86E-02
CR-51	Not Detected	--------	4.33E-01
CS-134	Not Detected	--------	7.33E-02
CS-137	4.88E-01	8.35E-02	5.29E-02
CU-64	Not Detected	--------	6.86E+05
EU-152	Not Detected	--------	3.67E-01
EU-154	Not Detected	--------	2.65E-01
EU-155	Not Detected	--------	2.14E-01
FE-59	Not Detected	--------	1.34E-01
GD-153	Not Detected	--------	1.71E-01
HG-203	Not Detected	--------	5.17E-02
I-131	Not Detected	--------	8.85E-02
IN-115m	Not Detected	--------	2.92E+12
IR-192	Not Detected	--------	4.55E-02
K-40	2.21E+01	3.14	4.46E-01
LA-140	Not Detected	--------	1.72
MN-54	Not Detected	--------	5.18E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	3.12
NA-22	Not Detected	--------	7.08E-02
NA-24	Not Detected	--------	5.38E+02
NB-95	Not Detected	--------	1.18
ND-147	Not Detected	--------	5.32E-01
NI-57	Not Detected	--------	3.26
BE-7	Not Detected	--------	4.68E-01
RU-103	Not Detected	--------	5.00E-02
RU-106	Not Detected	--------	4.23E-01
SB-122	Not Detected	--------	5.13E-01
SB-124	Not Detected	--------	5.35E-02
SB-125	Not Detected	--------	1.30E-01
SC-46	Not Detected	--------	7.95E-02
SR-85	Not Detected	--------	6.09E-02
TA-182	Not Detected	--------	2.27E-01
TA-183	Not Detected	--------	2.34
TE-132	Not Detected	--------	2.46E-01
TL-201	Not Detected	--------	1.66
XE-133	Not Detected	--------	2.73
Y-88	Not Detected	--------	3.74E-02
ZN-65	Not Detected	--------	1.54E-01
ZR-95	Not Detected	--------	9.55E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 7-08-95 12:26:11 AM *
****
*
* Analyzed by: 7/11/95 Reviewed by: 7/11/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024849-1
Lab Sample ID : 50050509

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 856.000 gram
Sample Date/Time : 6-29-95 2:10:00 PM
Acquire Start Date : 7-07-95 11:52:33 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.34
TH-234	Not Detected	--------	1.18
U-234	Not Detected	--------	1.98E+01
RA-226	7.50E-01	6.95E-01	1.10
PB-214	6.16E-01	1.24E-01	1.02E-01
BI-214	5.35E-01	1.11E-01	9.80E-02
PB-210	Not Detected	--------	4.85E+02
TH-232	9.01E-01	2.92E-01	3.56E-01
RA-228	5.42E-01	2.24E-01	2.91E-01
AC-228	Not Detected	--------	3.33E-01
TH-228	7.86E-01	3.74E-01	8.01E-01
RA-224	Not Detected	--------	7.18E-01
PB-212	7.52E-01	1.60E-01	6.85E-02
BI-212	8.41E-01	4.33E-01	6.06E-01
TL-208	7.44E-01	1.58E-01	1.34E-01
U-235	Not Detected	--------	3.86E-01
TH-231	Not Detected	--------	9.33E-01
PA-231	Not Detected	--------	1.75
AC-227	Not Detected	--------	2.77
TH-227	Not Detected	--------	5.73E-01
RA-223	Not Detected	--------	4.88E-01
RN-219	Not Detected	--------	4.47E-01
PB-211	Not Detected	--------	1.04
TL-207	Not Detected	--------	2.20E+01
AM-241	Not Detected	--------	8.77E-01
PU-239	Not Detected	--------	4.59E+02
NP-237	Not Detected	--------	5.91E-01
PA-233	Not Detected	--------	9.61E-02
TH-229	Not Detected	--------	4.43E-01

[Summary Report] - Sample ID: 50050509

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	9.01E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	9.32E-02
BA-140	Not Detected	--------	2.73E-01
CD-109	Not Detected	--------	2.02
CD-115	Not Detected	--------	1.47
CE-139	Not Detected	--------	4.81E-02
CE-141	Not Detected	--------	1.03E-01
CE-144	Not Detected	--------	4.05E-01
CO-56	Not Detected	--------	6.11E-02
CO-57	Not Detected	--------	4.96E-02
CO-58	Not Detected	--------	5.51E-02
CO-60	Not Detected	--------	6.40E-02
CR-51	Not Detected	--------	4.47E-01
CS-134	Not Detected	--------	7.56E-02
CS-137	3.46E-01	6.64E-02	5.10E-02
CU-64	Not Detected	--------	7.22E+05
EU-152	Not Detected	--------	3.94E-01
EU-154	Not Detected	--------	2.86E-01
EU-155	Not Detected	--------	2.34E-01
FE-59	Not Detected	--------	1.31E-01
GD-153	Not Detected	--------	1.78E-01
HG-203	Not Detected	--------	5.48E-02
I-131	Not Detected	--------	9.49E-02
IN-115m	Not Detected	--------	3.86E+12
IR-192	Not Detected	--------	4.66E-02
K-40	1.97E+01	2.84	5.65E-01
LA-140	Not Detected	--------	1.71
MN-54	Not Detected	--------	5.63E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	3.27
NA-22	Not Detected	--------	7.68E-02
NA-24	Not Detected	--------	6.18E+02
NB-95	Not Detected	--------	1.30
ND-147	Not Detected	--------	5.41E-01
NI-57	Not Detected	--------	3.94
BE-7	Not Detected	--------	4.64E-01
RU-103	Not Detected	--------	5.24E-02
RU-106	Not Detected	--------	4.75E-01
SB-122	Not Detected	--------	5.51E-01
SB-124	Not Detected	--------	5.30E-02
SB-125	Not Detected	--------	1.36E-01
SC-46	Not Detected	--------	9.36E-02
SR-85	Not Detected	--------	6.11E-02
TA-182	Not Detected	--------	2.76E-01
TA-183	Not Detected	--------	2.38
TE-132	Not Detected	--------	2.54E-01
TL-201	Not Detected	--------	1.75
XE-133	Not Detected	--------	3.01
Y-88	Not Detected	--------	3.92E-02
ZN-65	Not Detected	--------	1.70E-01
ZR-95	Not Detected	--------	1.02E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-08-95 1:04:56 AM

Analyzed by: Joanna Cole 7/11/95 Reviewed by: 7/14/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024850-1
Lab Sample ID : 50050510

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 1021.000 gram
Sample Date/Time : 6-29-95 2:00:00 PM
Acquire Start Date : 7-08-95 12:32:32 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.47
TH-234	Not Detected	--------	1.02
U-234	Not Detected	--------	1.63E+01
RA-226	9.75E-01	5.24E-01	7.68E-01
PB-214	4.55E-01	9.75E-02	8.85E-02
BI-214	3.73E-01	9.26E-02	1.03E-01
PB-210	Not Detected	--------	4.17E+02
TH-232	4.71E-01	1.59E-01	1.85E-01
RA-228	5.85E-01	2.20E-01	2.00E-01
AC-228	Not Detected	--------	2.83E-01
TH-228	8.69E-01	3.50E-01	6.09E-01
RA-224	1.44	3.89E-01	5.81E-01
PB-212	5.40E-01	1.23E-01	5.53E-02
BI-212	7.06E-01	3.75E-01	5.32E-01
TL-208	4.89E-01	1.24E-01	1.32E-01
U-235	Not Detected	--------	3.36E-01
TH-231	Not Detected	--------	8.12E-01
PA-231	Not Detected	--------	1.46
AC-227	Not Detected	--------	2.46
TH-227	Not Detected	--------	4.57E-01
RA-223	Not Detected	--------	4.18E-01
RN-219	Not Detected	--------	3.69E-01
PB-211	Not Detected	--------	8.61E-01
TL-207	Not Detected	--------	1.92E+01
AM-241	Not Detected	--------	7.72E-01
PU-239	Not Detected	--------	3.85E+02
NP-237	Not Detected	--------	5.13E-01
PA-233	Not Detected	--------	7.89E-02
TH-229	Not Detected	--------	3.78E-01

[Summary Report] - Sample ID: 50050510

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.94E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	7.69E-02
BA-140	Not Detected	--------	2.26E-01
CD-109	Not Detected	--------	1.74
CD-115	Not Detected	--------	1.18
CE-139	Not Detected	--------	4.24E-02
CE-141	Not Detected	--------	8.73E-02
CE-144	Not Detected	--------	3.38E-01
CO-56	Not Detected	--------	5.12E-02
CO-57	Not Detected	--------	4.26E-02
CO-58	Not Detected	--------	4.23E-02
CO-60	Not Detected	--------	5.36E-02
CR-51	Not Detected	--------	3.91E-01
CS-134	Not Detected	--------	6.26E-02
CS-137	3.17E-01	5.83E-02	4.06E-02
CU-64	Not Detected	--------	6.76E+05
EU-152	Not Detected	--------	3.49E-01
EU-154	Not Detected	--------	2.41E-01
EU-155	Not Detected	--------	1.94E-01
FE-59	Not Detected	--------	1.18E-01
GD-153	Not Detected	--------	1.50E-01
HG-203	Not Detected	--------	4.40E-02
I-131	Not Detected	--------	8.28E-02
IN-115m	Not Detected	--------	3.50E+12
IR-192	Not Detected	--------	3.98E-02
K-40	1.87E+01	2.66	4.85E-01
LA-140	Not Detected	--------	1.42
MN-54	Not Detected	--------	4.84E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	2.96
NA-22	Not Detected	--------	5.98E-02
NA-24	Not Detected	--------	5.42E+02
NB-95	Not Detected	--------	1.05
ND-147	Not Detected	--------	4.62E-01
NI-57	Not Detected	--------	3.45
BE-7	Not Detected	--------	3.62E-01
RU-103	Not Detected	--------	4.55E-02
RU-106	Not Detected	--------	4.03E-01
SB-122	Not Detected	--------	4.60E-01
SB-124	Not Detected	--------	4.52E-02
SB-125	Not Detected	--------	1.16E-01
SC-46	Not Detected	--------	7.65E-02
SR-85	Not Detected	--------	5.45E-02
TA-182	Not Detected	--------	2.19E-01
TA-183	Not Detected	--------	2.11
TE-132	Not Detected	--------	2.21E-01
TL-201	Not Detected	--------	1.49
XE-133	Not Detected	--------	2.54
Y-88	Not Detected	--------	3.38E-02
ZN-65	Not Detected	--------	1.45E-01
ZR-95	Not Detected	--------	8.37E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 7-08-95 1:41:51 AM *
****
*
* Analyzed by: 7/11/95 Reviewed by: 7/11/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024852-1
Lab Sample ID : 50050511

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 749.000 gram
Sample Date/Time : 6-29-95 1:58:00 PM
Acquire Start Date : 7-08-95 1:09:21 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.10
TH-234	Not Detected	--------	1.38
U-234	Not Detected	--------	2.15E+01
RA-226	2.06	9.21E-01	1.31
PB-214	8.82E-01	1.66E-01	1.21E-01
BI-214	6.90E-01	1.30E-01	9.34E-02
PB-210	Not Detected	--------	5.71E+02
TH-232	8.42E-01	2.66E-01	3.08E-01
RA-228	9.14E-01	3.07E-01	2.32E-01
AC-228	Not Detected	--------	3.70E-01
TH-228	7.17E-01	3.97E-01	9.65E-01
RA-224	2.15	5.35E-01	7.60E-01
PB-212	9.84E-01	1.91E-01	7.30E-02
BI-212	9.10E-01	4.92E-01	6.98E-01
TL-208	8.16E-01	1.79E-01	1.60E-01
U-235	Not Detected	--------	4.26E-01
TH-231	Not Detected	--------	1.03
PA-231	Not Detected	--------	1.96
AC-227	Not Detected	--------	3.27
TH-227	Not Detected	--------	6.88E-01
RA-223	Not Detected	--------	5.36E-01
RN-219	Not Detected	--------	5.19E-01
PB-211	Not Detected	--------	1.17
TL-207	Not Detected	--------	2.44E+01
AM-241	Not Detected	--------	9.88E-01
PU-239	Not Detected	--------	5.04E+02
NP-237	Not Detected	--------	6.76E-01
PA-233	Not Detected	--------	1.11E-01
TH-229	Not Detected	--------	4.85E-01

[Summary Report] - Sample ID: 50050511

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.08E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	1.17E-01
BA-140	Not Detected	--------	3.09E-01
CD-109	Not Detected	--------	2.38
CD-115	Not Detected	--------	1.67
CE-139	Not Detected	--------	5.78E-02
CE-141	Not Detected	--------	1.14E-01
CE-144	Not Detected	--------	4.40E-01
CO-56	Not Detected	--------	6.81E-02
CO-57	Not Detected	--------	5.83E-02
CO-58	Not Detected	--------	5.76E-02
CO-60	Not Detected	--------	6.39E-02
CR-51	Not Detected	--------	5.27E-01
CS-134	Not Detected	--------	9.24E-02
CS-137	4.46E-01	1.14E-01	3.95E-02
CU-64	Not Detected	--------	8.69E+05
EU-152	Not Detected	--------	4.48E-01
EU-154	Not Detected	--------	3.24E-01
EU-155	Not Detected	--------	2.57E-01
FE-59	Not Detected	--------	1.46E-01
GD-153	Not Detected	--------	1.94E-01
HG-203	Not Detected	--------	5.80E-02
I-131	Not Detected	--------	1.10E-01
IN-115m	Not Detected	--------	5.42E+12
IR-192	Not Detected	--------	5.60E-02
K-40	1.68E+01	2.48	5.40E-01
LA-140	Not Detected	--------	2.39
MN-54	Not Detected	--------	6.31E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	4.03
NA-22	Not Detected	--------	7.67E-02
NA-24	Not Detected	--------	7.56E+02
NB-95	Not Detected	--------	1.58
ND-147	Not Detected	--------	5.93E-01
NI-57	Not Detected	--------	4.58
BE-7	Not Detected	--------	5.20E-01
RU-103	Not Detected	--------	5.95E-02
RU-106	Not Detected	--------	5.04E-01
SB-122	Not Detected	--------	6.16E-01
SB-124	Not Detected	--------	6.17E-02
SB-125	Not Detected	--------	1.53E-01
SC-46	Not Detected	--------	1.03E-01
SR-85	Not Detected	--------	7.18E-02
TA-182	Not Detected	--------	3.02E-01
TA-183	Not Detected	--------	2.71
TE-132	Not Detected	--------	3.03E-01
TL-201	Not Detected	--------	2.05
XE-133	Not Detected	--------	3.24
Y-88	Not Detected	--------	5.30E-02
ZN-65	Not Detected	--------	1.97E-01
ZR-95	Not Detected	--------	1.17E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-08-95 2:18:42 AM

* Analyzed by: Young Cole 7/11/95 Reviewed by: 7/11/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024853-1
Lab Sample ID : 50050512

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 666.000 gram
Sample Date/Time : 6-29-95 1:50:00 PM
Acquire Start Date : 7-08-95 1:46:19 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.01
TH-234	Not Detected	--------	1.42
U-234	Not Detected	--------	2.33E+01
RA-226	1.28	8.11E-01	1.22
PB-214	6.57E-01	1.47E-01	1.41E-01
BI-214	5.74E-01	1.22E-01	1.06E-01
PB-210	Not Detected	--------	6.17E+02
TH-232	5.07E-01	2.27E-01	3.06E-01
RA-228	5.69E-01	2.67E-01	3.61E-01
AC-228	Not Detected	--------	3.83E-01
TH-228	Not Detected	--------	1.55
RA-224	1.76	5.24E-01	8.78E-01
PB-212	8.03E-01	1.88E-01	8.12E-02
BI-212	8.82E-01	4.58E-01	6.28E-01
TL-208	7.85E-01	1.76E-01	1.54E-01
U-235	Not Detected	--------	4.56E-01
TH-231	Not Detected	--------	1.08
PA-231	Not Detected	--------	2.14
AC-227	Not Detected	--------	3.22
TH-227	Not Detected	--------	6.73E-01
RA-223	Not Detected	--------	5.66E-01
RN-219	Not Detected	--------	5.26E-01
PB-211	Not Detected	--------	1.23
TL-207	Not Detected	--------	2.44E+01
AM-241	Not Detected	--------	1.01
PU-239	Not Detected	--------	5.25E+02
NP-237	Not Detected	--------	6.54E-01
PA-233	Not Detected	--------	1.14E-01
TH-229	Not Detected	--------	5.32E-01

[Summary Report] - Sample ID: 50050512

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.43E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	1.14E-01
BA-140	Not Detected	--------	3.33E-01
CD-109	Not Detected	--------	2.28
CD-115	Not Detected	--------	1.70
CE-139	Not Detected	--------	5.95E-02
CE-141	Not Detected	--------	1.23E-01
CE-144	Not Detected	--------	4.91E-01
CO-56	Not Detected	--------	7.14E-02
CO-57	Not Detected	--------	5.84E-02
CO-58	Not Detected	--------	6.51E-02
CO-60	Not Detected	--------	6.78E-02
CR-51	Not Detected	--------	5.58E-01
CS-134	Not Detected	--------	9.33E-02
CS-137	8.03E-01	1.28E-01	5.93E-02
CU-64	Not Detected	--------	1.03E+06
EU-152	Not Detected	--------	4.82E-01
EU-154	Not Detected	--------	3.51E-01
EU-155	Not Detected	--------	2.68E-01
FE-59	Not Detected	--------	1.52E-01
GD-153	Not Detected	--------	2.15E-01
HG-203	Not Detected	--------	6.40E-02
I-131	Not Detected	--------	1.22E-01
IN-115m	Not Detected	--------	6.13E+12
IR-192	Not Detected	--------	5.90E-02
K-40	2.08E+01	3.04	5.98E-01
LA-140	Not Detected	--------	2.33
MN-54	Not Detected	--------	6.71E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	4.09
NA-22	Not Detected	--------	7.84E-02
NA-24	Not Detected	--------	8.28E+02
NB-95	Not Detected	--------	1.56
ND-147	Not Detected	--------	6.88E-01
NI-57	Not Detected	--------	5.04
BE-7	Not Detected	--------	5.91E-01
RU-103	Not Detected	--------	6.63E-02
RU-106	Not Detected	--------	5.55E-01
SB-122	Not Detected	--------	6.66E-01
SB-124	Not Detected	--------	6.45E-02
SB-125	Not Detected	--------	1.65E-01
SC-46	Not Detected	--------	1.06E-01
SR-85	Not Detected	--------	7.86E-02
TA-182	Not Detected	--------	3.00E-01
TA-183	Not Detected	--------	2.78
TE-132	Not Detected	--------	3.21E-01
TL-201	Not Detected	--------	2.14
XE-133	Not Detected	--------	3.46
Y-88	Not Detected	--------	5.04E-02
ZN-65	Not Detected	--------	2.03E-01
ZR-95	Not Detected	--------	1.29E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-11-95 1:59:29 PM

Analyzed by: 7/11/95 Reviewed by: 7/11/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024854-1
Lab Sample ID : 50050513

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 671.000 gram
Sample Date/Time : 6-29-95 1:45:00 PM
Acquire Start Date : 7-10-95 12:48:08 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.00
TH-234	Not Detected	--------	1.47
U-234	Not Detected	--------	2.37E+01
RA-226	1.15	6.68E-01	9.86E-01
PB-214	6.60E-01	1.40E-01	1.22E-01
BI-214	6.77E-01	1.30E-01	9.18E-02
PB-210	Not Detected	--------	5.92E+02
TH-232	8.13E-01	2.79E-01	3.38E-01
RA-228	8.02E-01	3.02E-01	2.60E-01
AC-228	8.54E-01	2.21E-01	2.10E-01
TH-228	7.44E-01	4.54E-01	1.10
RA-224	1.97	4.76E-01	7.87E-01
PB-212	8.39E-01	1.73E-01	7.86E-02
BI-212	1.10	4.76E-01	6.10E-01
TL-208	7.47E-01	1.67E-01	1.40E-01
U-235	Not Detected	--------	4.57E-01
TH-231	Not Detected	--------	1.09
PA-231	Not Detected	--------	2.12
AC-227	Not Detected	--------	3.21
TH-227	Not Detected	--------	6.83E-01
RA-223	Not Detected	--------	6.64E-01
RN-219	Not Detected	--------	5.45E-01
PB-211	Not Detected	--------	1.24
TL-207	Not Detected	--------	2.39E+01
AM-241	Not Detected	--------	9.81E-01
PU-239	Not Detected	--------	5.19E+02
NP-237	Not Detected	--------	6.97E-01
PA-233	Not Detected	--------	1.14E-01
TH-229	Not Detected	--------	5.09E-01

[Summary Report] - Sample ID: 50050513

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.35E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	1.15E-01
BA-140	Not Detected	--------	3.65E-01
CD-109	Not Detected	--------	2.44
CD-115	Not Detected	--------	4.03
CE-139	Not Detected	--------	6.04E-02
CE-141	Not Detected	--------	1.28E-01
CE-144	Not Detected	--------	4.70E-01
CO-56	Not Detected	--------	7.49E-02
CO-57	Not Detected	--------	5.89E-02
CO-58	Not Detected	--------	6.96E-02
CO-60	Not Detected	--------	6.89E-02
CR-51	Not Detected	--------	5.98E-01
CS-134	Not Detected	--------	9.64E-02
CS-137	6.84E-01	1.14E-01	6.47E-02
CU-64	Not Detected	--------	2.16E+07
EU-152	Not Detected	--------	4.90E-01
EU-154	Not Detected	--------	3.49E-01
EU-155	Not Detected	--------	2.55E-01
FE-59	Not Detected	--------	1.72E-01
GD-153	Not Detected	--------	2.07E-01
HG-203	Not Detected	--------	6.44E-02
I-131	Not Detected	--------	1.48E-01
IN-115m	Not Detected	--------	6.25E+16
IR-192	Not Detected	--------	6.01E-02
K-40	1.89E+01	2.79	5.79E-01
LA-140	Not Detected	--------	6.40
MN-54	Not Detected	--------	6.62E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	7.67
NA-22	Not Detected	--------	8.42E-02
NA-24	Not Detected	--------	1.29E+04
NB-95	Not Detected	--------	2.54
ND-147	Not Detected	--------	7.11E-01
NI-57	Not Detected	--------	1.77E+01
BE-7	Not Detected	--------	5.66E-01
RU-103	Not Detected	--------	6.76E-02
RU-106	Not Detected	--------	5.67E-01
SB-122	Not Detected	--------	1.28
SB-124	Not Detected	--------	6.29E-02
SB-125	Not Detected	--------	1.61E-01
SC-46	Not Detected	--------	1.03E-01
SR-85	Not Detected	--------	7.60E-02
TA-182	Not Detected	--------	2.97E-01
TA-183	Not Detected	--------	3.77
TE-132	Not Detected	--------	5.22E-01
TL-201	Not Detected	--------	3.71
XE-133	Not Detected	--------	7.45
Y-88	Not Detected	--------	4.93E-02
ZN-65	Not Detected	--------	1.95E-01
ZR-95	Not Detected	--------	1.31E-01

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 7-11-95 12:13:04 PM *
****
*
* Analyzed by: 7/11/95 Reviewed by: 7/11/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024855-1
Lab Sample ID : 50050514

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 953.000 gram
Sample Date/Time : 6-29-95 1:40:00 PM
Acquire Start Date : 7-10-95 1:45:35 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.87
TH-234	1.01	5.11E-01	7.17E-01
U-234	Not Detected	--------	1.83E+01
RA-226	1.02	8.05E-01	1.26
PB-214	5.24E-01	1.09E-01	9.38E-02
BI-214	4.73E-01	9.62E-02	8.04E-02
PB-210	Not Detected	--------	4.35E+02
TH-232	6.03E-01	2.08E-01	2.56E-01
RA-228	5.63E-01	2.19E-01	2.00E-01
AC-228	Not Detected	--------	2.87E-01
TH-228	7.89E-01	3.49E-01	6.50E-01
RA-224	Not Detected	--------	6.33E-01
PB-212	6.37E-01	1.40E-01	5.79E-02
BI-212	3.75E-01	3.88E-01	6.14E-01
TL-208	6.45E-01	1.48E-01	1.44E-01
U-235	Not Detected	--------	3.45E-01
TH-231	Not Detected	--------	7.89E-01
PA-231	Not Detected	--------	1.51
AC-227	Not Detected	--------	2.53
TH-227	Not Detected	--------	4.94E-01
RA-223	Not Detected	--------	4.90E-01
RN-219	Not Detected	--------	4.02E-01
PB-211	Not Detected	--------	9.37E-01
TL-207	Not Detected	--------	2.12E+01
AM-241	Not Detected	--------	7.83E-01
PU-239	Not Detected	--------	3.95E+02
NP-237	Not Detected	--------	3.59E-01
PA-233	Not Detected	--------	8.33E-02
TH-229	Not Detected	--------	3.92E-01

[Summary Report] - Sample ID: 50050514

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	5.55E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	8.30E-02
BA-140	Not Detected	--------	2.86E-01
CD-109	Not Detected	--------	1.25
CD-115	Not Detected	--------	2.77
CE-139	Not Detected	--------	4.37E-02
CE-141	Not Detected	--------	9.48E-02
CE-144	Not Detected	--------	3.59E-01
CO-56	Not Detected	--------	5.62E-02
CO-57	Not Detected	--------	4.46E-02
CO-58	Not Detected	--------	5.02E-02
CO-60	Not Detected	--------	5.57E-02
CR-51	Not Detected	--------	4.35E-01
CS-134	Not Detected	--------	6.99E-02
CS-137	4.29E-02	2.85E-02	4.27E-02
CU-64	Not Detected	--------	2.16E+07
EU-152	Not Detected	--------	3.98E-01
EU-154	Not Detected	--------	2.49E-01
EU-155	Not Detected	--------	2.04E-01
FE-59	Not Detected	--------	1.41E-01
GD-153	Not Detected	--------	1.57E-01
HG-203	Not Detected	--------	4.99E-02
I-131	Not Detected	--------	1.02E-01
IN-115m	Not Detected	--------	4.99E+16
IR-192	Not Detected	--------	4.49E-02
K-40	2.18E+01	3.08	4.33E-01
LA-140	Not Detected	--------	3.82
MN-54	Not Detected	--------	5.51E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	5.80
NA-22	Not Detected	--------	6.78E-02
NA-24	Not Detected	--------	1.11E+04
NB-95	Not Detected	--------	1.86
ND-147	Not Detected	--------	5.79E-01
NI-57	Not Detected	--------	1.25E+01
BE-7	Not Detected	--------	4.24E-01
RU-103	Not Detected	--------	5.21E-02
RU-106	Not Detected	--------	4.14E-01
SB-122	Not Detected	--------	9.65E-01
SB-124	Not Detected	--------	5.01E-02
SB-125	Not Detected	--------	1.17E-01
SC-46	Not Detected	--------	7.90E-02
SR-85	Not Detected	--------	6.15E-02
TA-182	Not Detected	--------	2.26E-01
TA-183	Not Detected	--------	3.03
TE-132	Not Detected	--------	3.85E-01
TL-201	Not Detected	--------	2.78
XE-133	Not Detected	--------	5.94
Y-88	Not Detected	--------	3.47E-02
ZN-65	Not Detected	--------	1.48E-01
ZR-95	Not Detected	--------	9.62E-02

```
**********************************************************************
*                    Sandia National Laboratories                     *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory] *
*                       7-10-95  7:57:12 AM                           *
**********************************************************************
*                                                                    *
* Analyzed by: Young Cole 7/11/95    Reviewed by:  7/11/95           *
**********************************************************************
```

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
Lab Sample ID : 50050515

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 7-10-95 7:45:02 AM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:

****

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.17E+04
TH-234	Not Detected	--------	4.69E+03
U-234	Not Detected	--------	1.19E+05
RA-226	Not Detected	--------	5.87E+03
PB-214	Not Detected	--------	6.94E+02
BI-214	Not Detected	--------	6.41E+02
PB-210	Not Detected	--------	1.07E+07
TH-232	Not Detected	--------	2.03E+03
RA-228	Not Detected	--------	2.79E+03
AC-228	Not Detected	--------	1.77E+03
TH-228	Not Detected	--------	3.62E+04
RA-224	Not Detected	--------	3.15E+04
PB-212	Not Detected	--------	2.88E+03
BI-212	Not Detected	--------	2.55E+04
TL-208	Not Detected	--------	5.32E+03
U-235	Not Detected	--------	1.85E+03
TH-231	Not Detected	--------	3.82E+03
PA-231	Not Detected	--------	9.21E+03
AC-227	Not Detected	--------	1.60E+04
TH-227	Not Detected	--------	2.30E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	2.87E+03
PB-211	Not Detected	--------	8.48E+03
TL-207	Not Detected	--------	2.21E+05
AM-241	8.78E+04	1.55E+04	4.97E+03
PU-239	Not Detected	--------	2.14E+06
NP-237	Not Detected	--------	2.71E+03
PA-233	Not Detected	--------	6.05E+02
TH-229	Not Detected	--------	2.07E+03

[Summary Report] - Sample ID: 50050515

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	--------	1.79E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.52E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.01E+05	7.51E+04	8.12E+04
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	1.36E+06
CE-141	Not Detected	--------	3.00E+18
CE-144	Not Detected	--------	1.21E+05
CO-56	Not Detected	--------	1.90E+09
CO-57	Not Detected	--------	1.99E+04
CO-58	Not Detected	--------	6.97E+09
CO-60	7.56E+04	9.84E+03	4.76E+02
CR-51	Not Detected	--------	9.43E+21
CS-134	Not Detected	--------	1.48E+03
CS-137	6.80E+04	8.78E+03	6.46E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	3.38E+03
EU-154	Not Detected	--------	2.26E+03
EU-155	Not Detected	--------	2.13E+03
FE-59	Not Detected	--------	3.32E+14
GD-153	Not Detected	--------	1.07E+05
HG-203	Not Detected	--------	3.10E+13
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.70E+09
K-40	Not Detected	--------	1.62E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	1.75E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	8.25E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-7	Not Detected	--------	1.55E+13
RU-103	Not Detected	--------	4.54E+15
RU-106	Not Detected	--------	7.71E+04
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	1.09E+11
SB-125	Not Detected	--------	3.33E+03
SC-46	Not Detected	--------	6.57E+08
SR-85	Not Detected	--------	3.10E+10
TA-182	Not Detected	--------	4.02E+07
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	1.31E+07
ZN-65	Not Detected	--------	1.28E+05
ZR-95	Not Detected	--------	7.02E+10

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 7-10-95 8:00:00 AM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : MEC
Sample ID : 50050515
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 7-10-95 7:45:02 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.772E-02	3.508E-03	8.785E-02	<	Ac		>
CS-137 Activity	6.974E-02	2.429E-03	6.797E-02	<			>
CO-60 Activity	7.699E-02	2.526E-03	7.475E-02	<			>

O.K. mec 7/11/95

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: George Cole 7/11/95

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 2

SF 2001-COC (9-94) 500505

AR/COC- 03859

Dept. No./Mail Stop: 7585
Project/Task Manager: Mike Young
Project Name: ADS 1332 scoping samp
Record Center Code:
Logbook Ref No: pg -22
SMO Reference No.: CF-0103

Date Samples Shipped: 6-30-95
Carrier/Waybill No.: HC
Lab Contact: Amir Mohagheghi
Lab Destination: SNL 7715
SMO Contact/Phone: Mack
Send Report to SMO Deborah McLaughlin

Contract No.: NA
Case No.: 3628.600
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location Tech Area ER site 8
Building NA Room NA

Parameter & Method Requested

Reference LOV (available at SMO)

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
024841-01	08-GR-001-0-SS	0	08	6-29-95 1433	S	P	500 ml	None	G	SA	X	
024842-01	002			1430								
024843-01	003			1428								
024844-01	004			1425								
024845-01	005			1422								
024846-01	006			1420								
024847-01	007			1418								
024848-01	008			1415								
024849-01	009			1410								
024850-01	010			1400								

LAB USE

RMMA ☐ Yes ☒ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking SMO USE
Date Entered (mm/dd/yy) 7/13/95
Entered by: AWZ
QC inits.

Special Instructions/QC Requirements

Abnormal Conditions on Receipt LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization
	J. Boyd	JBoyd	JB	FT/ 7584

1. Relinquished by	JBoyd	Org. FT/7584	Date 6-29-95	Time 1645	4. Relinquished by		Org.	Date	Time
1. Received by	Edward Rankin	Org. SMO 7513	Date 6-29-95	Time 1645	4. Received by		Org.	Date	Time
2. Relinquished by	Edward Rankin	Org. SMO 7573	Date 6-30-95	Time 0951	5. Relinquished by		Org.	Date	Time
2. Received by	AMM	Org. 7715	Date 30-95	Time 0951	5. Received by		Org.	Date	Time
3. Relinquished by	for AMM	Org. SNL 7715	Date 7/11/95	Time 1700	6. Relinquished by		Org.	Date	Time
3. Received by		Org. SMO 7573	Date 7-11-95	Time 1700	6. Received by		Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

AR/COC- 03862 03859

AMIR

Project Name: ADS 1332 Scoping sampling Project/Task Manager: Mike Young Case No.: 3628.600

Location Tech Area ER Site 58

Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Parameter & Method Requested	Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	
024852-01	08-GR 011 0-5S	0	608	6-29-95 1358	S	P	500 ml	None	G	SA	X	
024853-01	012			1350 1345							X	
024854-01	013			1345							X	
024855-01	014			1340							X	

Abnormal Conditions on Receipt

Recipient Initials _____

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Feature 8GGG

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

SF 2001-COC (5-97) Superseded (6-95) Issue

Internal Lab Batch No. 800016 SAR/WR No. AR/COC- 510121

Dept. No./Mail Stop: 6134/MS 1148
Project/Task Manager: Caroline Byrd
Project Name: Surface Soil Sampling 38
Record Center Code: ER/1332/E 1BAT
Logbook Ref No: 006
Service Order No.: CF0535 00 VAM

Date Samples Shipped: 1/7/98 SMO USE
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: ERSD Building 881
SMO Contact/Phone: Doug Dalin 844-7683
Send Report to SMO Angela Chavez

Contract No.: AJ2480A
Case No.: 7213.130
SMO Authorization: DMB
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154

Location Tech Area N/A Building N/A Room N/A

Parameter & Method Requested: Gamma 1332E

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
✓ 033253-004	AOCB-GR-034-038	0	8	1-6-98 0915	S	P	500ml	None	G	SA	LAB USE
✓ 033254-004	035			0920							
✓ 033255-004	036			1000							
✓ 033256-004	037			1020							
✓ 033257-004	038			1025							
✓ 033258-004	039			1045							
✓ 033259-004	034-G-SSA			0915						DU	

RMMA ☐ Yes ☒ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking SMO USE: Date Entered (mm/dd/yy) 1-16-98 Entered by

QC inits. VAM

Special Instructions/QC Requirements: * Send a separate report to Ed Mignardot (284-3733).

Abnormal Conditions on Receipt LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	ANGEL G VEGA	Angel G Vega	AGV	AMA/6131/844-9081
	Nelson Cupitan		NC	IT/6131 764-3507

1. Relinquished by		Org. IT/6131	Date 1-7-98	Time 1100	4. Relinquished by		Org.	Date	Time
1. Received by		Org. SNL7578	Date 1/7/98	Time 1100	4. Received by		Org.	Date	Time
2. Relinquished by		Org. SNL7578	Date 1/7/98	Time 1115	5. Relinquished by		Org.	Date	Time
2. Received by		Org. SNL7578	Date 1/7/98	Time 1115	5. Received by		Org.	Date	Time
3. Relinquished by		Org. SNL7578	Date 1/9/98	Time 1500	6. Relinquished by		Org.	Date	Time
3. Received by		Org. SNL7578	Date 1/9/98	Time 1500	6. Received by		Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134/MS 1146
Project Location: Lurkee Soil Sampling SE
Phone: (505) 284-2531
Date Results Needed: 1/12/98 or ASAP
Suspect Isotopes: UNK
Other Information: CoC 510121

Hazards/Special Instructions:
*Send a separate report to Ed Mignardot (284-3733).

case # 7213.130

Batch Log Number: 800016
Logged By: JM

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
C33253-004	S	1-6-98 0915	500ml	Gamma Spec	01	<300	782g	
C33254-004		0920			02		885g	
C33255-004		1000			03		790g	
C33256-004		1020			04		921g	
C33257-004		1025			05		983g	
C33258-004		1045			06		884g	
C33259-004		0915			07	<300	800g	
LCS	—	1/5/98	—	Gamma Spec	08	N/A	N/A	

Relinquished by [signature] Date 1/7/98 Time 1115 Received by [signature] Date 1/7/98 Time 1115
Relinquished by [signature] Date 1/9/98 Time 1500 Received by [signature] Date 1/9/98 Time 1500
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 1-07-98 2:00:54 PM *
****

* Analyzed by: 1/8/98 Reviewed by: 1/9/98 *

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 033253-004
Lab Sample ID : 80001601

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 782.000 gram
Sample Date/Time : 1-06-98 9:15:00 AM
Acquire Start Date/Time : 1-07-98 12:18:18 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.38E+00
TH-234	6.19E-01	3.19E-01	4.07E-01
RA-226	9.35E-01	9.83E-01	4.57E-01
PB-214	3.97E-01	9.59E-02	4.52E-02
BI-214	3.44E-01	8.11E-02	4.60E-02
PB-210	Not Detected	---	6.91E+00
TH-232	5.04E-01	6.81E-01	1.31E-01
RA-228	4.55E-01	2.10E-01	1.96E-01
AC-228	4.88E-01	2.06E-01	9.98E-02
TH-228	4.97E-01	3.27E-01	4.07E-01
RA-224	4.73E-01	1.86E-01	8.91E-02
PB-212	5.23E-01	9.59E-02	3.78E-02
BI-212	6.34E-01	3.52E-01	3.20E-01
TL-208	5.11E-01	1.23E-01	6.72E-02
U-235	~~1.02E-01~~	~~1.70E-01~~	1.88E-01
TH-231	Not Detected	---	2.08E+00
PA-231	Not Detected	---	3.20E+00
TH-227	Not Detected	---	3.14E-01
RA-223	Not Detected	---	1.29E-01
RN-219	Not Detected	---	3.74E-01
PB-211	Not Detected	---	8.78E-01
TL-207	Not Detected	---	1.49E+01
AM-241	Not Detected	---	1.68E-01
PU-239	Not Detected	---	3.17E+02
NP-237	~~3.42E-01~~	~~1.40E-01~~	1.88E-01
PA-233	Not Detected	---	5.29E-02
TH-229	Not Detected	---	1.83E-01

not detected 1/8/98

not detected 1/8/98

[Summary Report] - Sample ID: : 80001601

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.17E-02
AG-110m	Not Detected	---------	3.92E-02
AM-243	Not Detected	---------	5.56E-02
BA-133	Not Detected	---------	4.22E-02
BE-7	Not Detected	---------	2.56E-01
CD-109	Not Detected	---------	8.49E-01
CD-115	Not Detected	---------	8.38E-02
CE-139	Not Detected	---------	2.35E-02
CE-141	Not Detected	---------	4.17E-02
CE-144	Not Detected	---------	1.75E-01
CO-56	Not Detected	---------	4.01E-02
CO-57	Not Detected	---------	2.27E-02
CO-58	Not Detected	---------	3.56E-02
CO-60	Not Detected	---------	4.17E-02
CR-51	Not Detected	---------	2.26E-01
CS-134	Not Detected	---------	4.27E-02
CS-137	6.90E-02	3.16E-02	2.35E-02
EU-152	Not Detected	---------	6.77E-02
EU-154	Not Detected	---------	1.91E-01
EU-155	Not Detected	---------	1.05E-01
FE-59	Not Detected	---------	8.90E-02
GD-153	Not Detected	---------	7.34E-02
HG-203	Not Detected	---------	2.79E-02
I-131	Not Detected	---------	3.06E-02
IR-192	Not Detected	---------	2.50E-02
K-40	2.20E+01	3.36E+00	2.45E-01
KR-85	Not Detected	---------	7.99E+00
MN-52	Not Detected	---------	4.07E-02
MN-54	Not Detected	---------	3.61E-02
MO-99	Not Detected	---------	3.33E-01
NA-22	Not Detected	---------	5.10E-02
NA-24	Not Detected	---------	1.40E-01
NB-95	Not Detected	---------	1.75E-01
ND-147	Not Detected	---------	2.11E-01
NI-57	Not Detected	---------	8.33E-02
NP-239	Not Detected	---------	9.39E-02
RU-103	Not Detected	---------	2.84E-02
RU-106	Not Detected	---------	2.90E-01
SB-122	Not Detected	---------	5.19E-02
SB-124	Not Detected	---------	3.03E-02
SB-125	Not Detected	---------	8.10E-02
SN-113	Not Detected	---------	3.32E-02
TA-182	Not Detected	---------	1.60E-01
TA-183	Not Detected	---------	1.67E-01
TC-99m	Not Detected	---------	5.54E-01
TL-201	Not Detected	---------	1.27E-01
XE-133	Not Detected	---------	1.22E-01
Y-88	Not Detected	---------	2.75E-02
ZN-65	Not Detected	---------	1.10E-01
ZR-95	Not Detected	---------	5.76E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

1-07-98 3:46:01 PM

Analyzed by: 1/8/98 Reviewed by: 1/9/98

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 033254-004
Lab Sample ID : 80001602

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 885.000 gram
Sample Date/Time : 1-06-98 9:20:00 AM
Acquire Start Date/Time : 1-07-98 2:03:21 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	1.36E+00	
TH-234	Not Detected	---	4.39E-01	
RA-226	1.05E+00	4.23E-01	4.29E-01	
PB-214	5.46E-01	1.08E-01	4.58E-02	
BI-214	4.33E-01	1.02E-01	4.62E-02	
PB-210	Not Detected	---	6.91E+00	
TH-232	6.96E-01	3.63E-01	1.30E-01	
RA-228	6.59E-01	1.88E-01	1.58E-01	
AC-228	5.88E-01	1.75E-01	9.47E-02	
TH-228	6.54E-01	4.45E-01	4.14E-01	
RA-224	6.86E-01	2.76E-01	7.93E-02	
PB-212	6.59E-01	1.10E-01	3.72E-02	
BI-212	8.66E-01	5.07E-01	3.12E-01	
TL-208	5.56E-01	1.54E-01	6.70E-02	
~~U-235~~	~~1.38E-01~~	~~1.72E-01~~	1.89E-01	not detected 1/8/98
TH-231	Not Detected	---	2.06E+00	
PA-231	Not Detected	---	3.27E+00	
TH-227	Not Detected	---	3.27E-01	
RA-223	Not Detected	---	1.36E-01	
RN-219	Not Detected	---	3.65E-01	
PB-211	Not Detected	---	8.16E-01	
TL-207	Not Detected	---	1.38E+01	
AM-241	Not Detected	---	1.68E-01	
PU-239	Not Detected	---	3.20E+02	
~~NP-237~~	~~4.45E-01~~	~~2.22E-01~~	1.70E-01	not detected 1/8/98
PA-233	Not Detected	---	5.20E-02	
TH-229	Not Detected	---	1.73E-01	

[Summary Report] - Sample ID: : 80001602

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.06E-02
AG-110m	Not Detected	---	4.82E-02
AM-243	Not Detected	---	5.24E-02
BA-133	Not Detected	---	4.17E-02
BE-7	Not Detected	---	2.47E-01
CD-109	Not Detected	---	8.55E-01
CD-115	Not Detected	---	8.92E-02
CE-139	Not Detected	---	2.37E-02
CE-141	Not Detected	---	4.17E-02
CE-144	Not Detected	---	1.74E-01
CO-56	Not Detected	---	3.47E-02
CO-57	Not Detected	---	2.21E-02
CO-58	Not Detected	---	3.18E-02
CO-60	Not Detected	---	3.72E-02
CR-51	Not Detected	---	2.21E-01
CS-134	Not Detected	---	4.39E-02
CS-137	Not Detected	---	2.59E-02
EU-152	Not Detected	---	6.68E-02
EU-154	Not Detected	---	1.86E-01
EU-155	Not Detected	---	1.04E-01
FE-59	Not Detected	---	8.15E-02
GD-153	Not Detected	---	7.30E-02
HG-203	Not Detected	---	2.87E-02
I-131	Not Detected	---	3.10E-02
IR-192	Not Detected	---	2.49E-02
K-40	1.88E+01	2.85E+00	2.61E-01
KR-85	Not Detected	---	7.84E+00
MN-52	Not Detected	---	3.59E-02
MN-54	Not Detected	---	3.49E-02
MO-99	Not Detected	---	3.20E-01
NA-22	Not Detected	---	4.55E-02
NA-24	Not Detected	---	1.31E-01
NB-95	Not Detected	---	1.83E-01
ND-147	Not Detected	---	2.07E-01
NI-57	Not Detected	---	8.25E-02
NP-239	Not Detected	---	9.36E-02
RU-103	Not Detected	---	2.89E-02
RU-106	Not Detected	---	2.93E-01
SB-122	Not Detected	---	5.31E-02
SB-124	Not Detected	---	3.00E-02
SB-125	Not Detected	---	7.87E-02
SN-113	Not Detected	---	3.49E-02
TA-182	Not Detected	---	1.54E-01
TA-183	Not Detected	---	1.69E-01
TC-99m	Not Detected	---	6.73E-01
TL-201	Not Detected	---	1.28E-01
XE-133	Not Detected	---	1.28E-01
Y-88	Not Detected	---	2.68E-02
ZN-65	Not Detected	---	1.05E-01
ZR-95	Not Detected	---	6.06E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
1-07-98 5:31:03 PM

Analyzed by: 1/8/98 Reviewed by: 1/9/98

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 033255-004
Lab Sample ID : 80001603

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 790.000 gram
Sample Date/Time : 1-06-98 10:00:00 AM
Acquire Start Date/Time : 1-07-98 3:48:27 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.39E+00
TH-234	Not Detected	---	4.16E-01
RA-226	7.50E-01	4.39E-01	4.68E-01
PB-214	3.92E-01	8.54E-02	4.73E-02
BI-214	3.96E-01	9.84E-02	5.09E-02
PB-210	Not Detected	---	7.39E+00
TH-232	5.62E-01	2.81E-01	1.25E-01
RA-228	5.75E-01	2.02E-01	1.74E-01
AC-228	5.84E-01	2.11E-01	9.97E-02
TH-228	5.17E-01	3.39E-01	4.02E-01
RA-224	5.19E-01	3.01E-01	7.68E-02
PB-212	5.74E-01	1.00E-01	3.57E-02
BI-212	6.59E-01	4.44E-01	3.31E-01
TL-208	5.17E-01	1.25E-01	7.09E-02
U-235	Not Detected	---	1.92E-01
TH-231	Not Detected	---	2.07E+00
PA-231	Not Detected	---	3.25E+00
TH-227	Not Detected	---	3.27E-01
RA-223	Not Detected	---	1.35E-01
RN-219	Not Detected	---	3.85E-01
PB-211	Not Detected	---	8.37E-01
TL-207	Not Detected	---	1.63E+01
AM-241	Not Detected	---	1.70E-01
PU-239	Not Detected	---	3.29E+02
NP-237	~~3.47E-01~~	~~1.26E-01~~	1.94E-01 Not detected
PA-233	Not Detected	---	5.47E-02
TH-229	Not Detected	---	1.84E-01

1/8/98

[Summary Report] - Sample ID: : 80001603

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.32E-02
AG-110m	Not Detected	---	4.36E-02
AM-243	Not Detected	---	5.20E-02
BA-133	Not Detected	---	4.30E-02
BE-7	Not Detected	---	2.57E-01
CD-109	Not Detected	---	8.80E-01
CD-115	Not Detected	---	9.07E-02
CE-139	Not Detected	---	2.44E-02
CE-141	Not Detected	---	4.35E-02
CE-144	Not Detected	---	1.78E-01
CO-56	Not Detected	---	3.96E-02
CO-57	Not Detected	---	2.28E-02
CO-58	Not Detected	---	3.48E-02
CO-60	Not Detected	---	4.33E-02
CR-51	Not Detected	---	2.27E-01
CS-134	Not Detected	---	4.36E-02
CS-137	1.03E-01	3.61E-02	2.26E-02
EU-152	Not Detected	---	6.90E-02
EU-154	Not Detected	---	1.98E-01
EU-155	Not Detected	---	1.09E-01
FE-59	Not Detected	---	9.05E-02
GD-153	Not Detected	---	7.43E-02
HG-203	Not Detected	---	2.98E-02
I-131	Not Detected	---	3.29E-02
IR-192	Not Detected	---	2.50E-02
K-40	2.16E+01	3.27E+00	2.67E-01
KR-85	Not Detected	---	8.24E+00
MN-52	Not Detected	---	4.31E-02
MN-54	Not Detected	---	3.55E-02
MO-99	Not Detected	---	3.59E-01
NA-22	Not Detected	---	4.94E-02
NA-24	Not Detected	---	1.43E-01
NB-95	Not Detected	---	1.85E-01
ND-147	Not Detected	---	2.24E-01
NI-57	Not Detected	---	1.01E-01
NP-239	Not Detected	---	9.66E-02
RU-103	Not Detected	---	3.05E-02
RU-106	Not Detected	---	2.95E-01
SB-122	Not Detected	---	5.44E-02
SB-124	Not Detected	---	3.07E-02
SB-125	Not Detected	---	8.91E-02
SN-113	Not Detected	---	3.69E-02
TA-182	Not Detected	---	1.66E-01
TA-183	Not Detected	---	1.72E-01
TC-99m	Not Detected	---	7.78E-01
TL-201	Not Detected	---	1.33E-01
XE-133	Not Detected	---	1.31E-01
Y-88	Not Detected	---	2.76E-02
ZN-65	Not Detected	---	1.14E-01
ZR-95	Not Detected	---	6.32E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
1-07-98 7:16:09 PM

Analyzed by: 1/8/98 Reviewed by: 1/9/98

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 033256-004
Lab Sample ID : 80001604

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 921.000 gram
Sample Date/Time : 1-06-98 10:20:00 AM
Acquire Start Date/Time : 1-07-98 5:33:30 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.26E+00
TH-234	8.04E-01	3.96E-01	4.02E-01
RA-226	Not Detected	---	4.82E-01
PB-214	4.23E-01	1.42E-01	4.23E-02
BI-214	4.17E-01	6.42E-02	4.21E-02
PB-210	Not Detected	---	6.62E+00
TH-232	5.60E-01	2.80E-01	1.20E-01
RA-228	5.00E-01	1.84E-01	1.45E-01
AC-228	6.35E-01	1.66E-01	8.10E-02
TH-228	7.71E-01	3.67E-01	4.37E-01
RA-224	6.26E-01	2.49E-01	7.74E-02
PB-212	5.68E-01	1.01E-01	3.62E-02
BI-212	7.12E-01	3.91E-01	3.02E-01
TL-208	5.21E-01	1.84E-01	6.38E-02
U-235	~~1.08E-01~~	~~9.17E-02~~	1.10E-01 Not detected 1/8/98
TH-231	Not Detected	---	1.89E+00
PA-231	Not Detected	---	2.98E+00
TH-227	Not Detected	---	3.02E-01
RA-223	Not Detected	---	1.28E-01
RN-219	Not Detected	---	3.40E-01
PB-211	Not Detected	---	7.76E-01
TL-207	Not Detected	---	1.33E+01
AM-241	Not Detected	---	1.58E-01
PU-239	Not Detected	---	2.95E+02
NP-237	~~2.82E-01~~	~~1.06E-01~~	1.68E-01 Not detected 1/8/98
PA-233	Not Detected	---	4.79E-02
TH-229	Not Detected	---	1.68E-01

[Summary Report] - Sample ID: : 80001604

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.86E-02
AG-110m	Not Detected	---------	4.13E-02
AM-243	Not Detected	---------	4.76E-02
BA-133	Not Detected	---------	3.95E-02
BE-7	Not Detected	---------	2.24E-01
CD-109	Not Detected	---------	7.95E-01
CD-115	Not Detected	---------	8.27E-02
CE-139	Not Detected	---------	2.25E-02
CE-141	Not Detected	---------	4.06E-02
CE-144	Not Detected	---------	1.59E-01
CO-56	Not Detected	---------	3.51E-02
CO-57	Not Detected	---------	2.12E-02
CO-58	Not Detected	---------	3.04E-02
CO-60	Not Detected	---------	3.82E-02
CR-51	Not Detected	---------	2.02E-01
CS-134	Not Detected	---------	3.97E-02
CS-137	1.23E-01	3.34E-02	2.12E-02
EU-152	Not Detected	---------	6.42E-02
EU-154	Not Detected	---------	1.75E-01
EU-155	Not Detected	---------	9.77E-02
FE-59	Not Detected	---------	7.43E-02
GD-153	Not Detected	---------	6.82E-02
HG-203	Not Detected	---------	2.77E-02
I-131	Not Detected	---------	2.77E-02
IR-192	Not Detected	---------	2.34E-02
K-40	1.79E+01	2.73E+00	2.49E-01
KR-85	Not Detected	---------	7.48E+00
MN-52	Not Detected	---------	2.90E-02
MN-54	Not Detected	---------	3.30E-02
MO-99	Not Detected	---------	3.18E-01
NA-22	Not Detected	---------	4.05E-02
NA-24	Not Detected	---------	1.37E-01
NB-95	Not Detected	---------	1.73E-01
ND-147	Not Detected	---------	1.99E-01
NI-57	Not Detected	---------	9.10E-02
NP-239	Not Detected	---------	8.69E-02
RU-103	Not Detected	---------	2.71E-02
RU-106	Not Detected	---------	2.54E-01
SB-122	Not Detected	---------	5.05E-02
SB-124	Not Detected	---------	2.65E-02
SB-125	Not Detected	---------	7.60E-02
SN-113	Not Detected	---------	3.36E-02
TA-182	Not Detected	---------	1.46E-01
TA-183	Not Detected	---------	1.61E-01
TC-99m	Not Detected	---------	8.66E-01
TL-201	Not Detected	---------	1.21E-01
XE-133	Not Detected	---------	1.26E-01
Y-88	Not Detected	---------	2.41E-02
ZN-65	Not Detected	---------	1.00E-01
ZR-95	Not Detected	---------	5.58E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

1-08-98 9:14:57 AM

Analyzed by: 1/8/98 Reviewed by: 1/9/98

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 033257-004
Lab Sample ID : 80001605

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 983.000 gram
Sample Date/Time : 1-06-98 10:25:00 AM
Acquire Start Date/Time : 1-08-98 7:32:15 AM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.29E+00
TH-234	7.09E-01	3.17E-01	3.75E-01
RA-226	1.13E+00	5.01E-01	4.95E-01
PB-214	4.90E-01	1.00E-01	4.22E-02
BI-214	4.73E-01	1.11E-01	4.43E-02
PB-210	Not Detected	---	6.54E+00
TH-232	6.41E-01	3.13E-01	1.15E-01
RA-228	5.70E-01	1.77E-01	1.45E-01
AC-228	6.26E-01	2.70E-01	8.15E-02
TH-228	6.27E-01	5.21E-01	3.70E-01
RA-224	6.84E-01	2.66E-01	7.10E-02
PB-212	6.09E-01	1.02E-01	3.39E-02
BI-212	7.08E-01	4.55E-01	2.93E-01
TL-208	6.13E-01	1.35E-01	5.89E-02
U-235	Not Detected	---	1.75E-01
TH-231	Not Detected	---	1.88E+00
PA-231	Not Detected	---	2.90E+00
TH-227	Not Detected	---	2.99E-01
RA-223	Not Detected	---	1.25E-01
RN-219	Not Detected	---	3.43E-01
PB-211	Not Detected	---	7.66E-01
TL-207	Not Detected	---	1.26E+01
AM-241	Not Detected	---	1.58E-01
PU-239	Not Detected	---	2.91E+02
NP-237	~~3.27E-01~~	~~1.29E-01~~	1.88E-01 not detected
PA-233	Not Detected	---	4.94E-02
TH-229	Not Detected	---	1.71E-01

1/8/98

[Summary Report] - Sample ID: : 80001605

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.73E-02
AG-110m	Not Detected	---------	3.77E-02
AM-243	Not Detected	---------	5.43E-02
BA-133	Not Detected	---------	3.88E-02
BE-7	1.27E-01	9.59E-02	1.30E-01
CD-109	Not Detected	---------	7.83E-01
CD-115	Not Detected	---------	9.68E-02
CE-139	Not Detected	---------	2.18E-02
CE-141	Not Detected	---------	3.98E-02
CE-144	Not Detected	---------	1.61E-01
CO-56	Not Detected	---------	3.26E-02
CO-57	Not Detected	---------	2.07E-02
CO-58	Not Detected	---------	2.87E-02
CO-60	Not Detected	---------	3.42E-02
CR-51	Not Detected	---------	2.03E-01
CS-134	Not Detected	---------	4.14E-02
CS-137	9.38E-02	2.83E-02	2.20E-02
EU-152	Not Detected	---------	6.21E-02
EU-154	Not Detected	---------	1.73E-01
EU-155	Not Detected	---------	9.64E-02
FE-59	Not Detected	---------	7.54E-02
GD-153	Not Detected	---------	6.87E-02
HG-203	Not Detected	---------	2.58E-02
I-131	Not Detected	---------	2.94E-02
IR-192	Not Detected	---------	2.32E-02
K-40	1.76E+01	2.65E+00	2.17E-01
KR-85	Not Detected	---------	7.38E+00
MN-52	Not Detected	---------	3.94E-02
MN-54	Not Detected	---------	3.10E-02
MO-99	Not Detected	---------	3.53E-01
NA-22	Not Detected	---------	4.11E-02
NA-24	Not Detected	---------	2.55E-01
NB-95	Not Detected	---------	1.92E-01
ND-147	Not Detected	---------	1.88E-01
NI-57	Not Detected	---------	1.05E-01
NP-239	Not Detected	---------	8.73E-02
RU-103	Not Detected	---------	2.72E-02
RU-106	Not Detected	---------	2.53E-01
SB-122	Not Detected	---------	5.60E-02
SB-124	Not Detected	---------	2.65E-02
SB-125	Not Detected	---------	7.44E-02
SN-113	Not Detected	---------	3.29E-02
TA-182	Not Detected	---------	1.46E-01
TA-183	Not Detected	---------	1.74E-01
TC-99m	Not Detected	---------	4.14E+00
TL-201	Not Detected	---------	1.39E-01
XE-133	Not Detected	---------	1.43E-01
Y-88	Not Detected	---------	2.51E-02
ZN-65	Not Detected	---------	9.94E-02
ZR-95	Not Detected	---------	5.67E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 1-08-98 2:06:57 PM *
****

* Analyzed by: 1/8/98 Reviewed by: 1/9/98 *

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 033258-004
Lab Sample ID : 80001606

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 884.000 gram
Sample Date/Time : 1-06-98 10:45:00 AM
Acquire Start Date/Time : 1-08-98 9:17:23 AM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.32E+00
TH-234	1.07E+00	3.79E-01	4.35E-01
RA-226	7.87E-01	6.71E-01	5.31E-01
PB-214	4.01E-01	8.17E-02	4.12E-02
BI-214	3.80E-01	1.07E-01	4.63E-02
PB-210	Not Detected	---	6.70E+00
TH-232	6.26E-01	3.10E-01	1.24E-01
RA-228	5.87E-01	1.90E-01	1.68E-01
AC-228	6.45E-01	1.97E-01	9.71E-02
TH-228	3.69E-01	1.83E-01	4.61E-01
RA-224	6.34E-01	2.56E-01	7.89E-02
PB-212	5.88E-01	1.00E-01	3.48E-02
BI-212	8.72E-01	5.47E-01	3.49E-01
TL-208	5.68E-01	1.30E-01	6.68E-02
U-235	Not Detected	---	1.83E-01
TH-231	Not Detected	---	1.94E+00
PA-231	Not Detected	---	3.11E+00
TH-227	Not Detected	---	3.11E-01
RA-223	Not Detected	---	1.34E-01
RN-219	Not Detected	---	3.60E-01
PB-211	Not Detected	---	8.07E-01
TL-207	Not Detected	---	1.42E+01
AM-241	Not Detected	---	1.57E-01
PU-239	Not Detected	---	3.13E+02
NP-237	~~4.59E-01~~	~~1.37E-01~~	2.07E-01 Not detected
PA-233	Not Detected	---	5.17E-02
TH-229	Not Detected	---	1.70E-01

1/8/98

[Summary Report] - Sample ID: : 80001606

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.09E-02
AG-110m	Not Detected	---------	3.27E-02
AM-243	Not Detected	---------	4.94E-02
BA-133	Not Detected	---------	3.92E-02
BE-7	Not Detected	---------	2.30E-01
CD-109	Not Detected	---------	8.21E-01
CD-115	Not Detected	---------	1.06E-01
CE-139	Not Detected	---------	2.24E-02
CE-141	Not Detected	---------	4.14E-02
CE-144	Not Detected	---------	1.70E-01
CO-56	Not Detected	---------	3.43E-02
CO-57	Not Detected	---------	2.15E-02
CO-58	Not Detected	---------	3.22E-02
CO-60	Not Detected	---------	3.67E-02
CR-51	Not Detected	---------	2.21E-01
CS-134	Not Detected	---------	4.14E-02
CS-137	2.11E-02	2.70E-02	2.48E-02
EU-152	Not Detected	---------	6.47E-02
EU-154	Not Detected	---------	1.89E-01
EU-155	Not Detected	---------	1.01E-01
FE-59	Not Detected	---------	7.82E-02
GD-153	Not Detected	---------	6.78E-02
HG-203	Not Detected	---------	2.86E-02
I-131	Not Detected	---------	3.10E-02
IR-192	Not Detected	---------	2.49E-02
K-40	2.10E+01	3.13E+00	2.44E-01
KR-85	Not Detected	---------	7.78E+00
MN-52	Not Detected	---------	4.19E-02
MN-54	Not Detected	---------	3.58E-02
MO-99	Not Detected	---------	3.79E-01
NA-22	Not Detected	---------	4.60E-02
NA-24	Not Detected	---------	3.06E-01
NB-95	Not Detected	---------	2.02E-01
ND-147	Not Detected	---------	2.17E-01
NI-57	Not Detected	---------	1.17E-01
NP-239	Not Detected	---------	9.10E-02
RU-103	Not Detected	---------	2.90E-02
RU-106	Not Detected	---------	2.71E-01
SB-122	Not Detected	---------	6.17E-02
SB-124	Not Detected	---------	2.81E-02
SB-125	Not Detected	---------	8.01E-02
SN-113	Not Detected	---------	3.51E-02
TA-182	Not Detected	---------	1.55E-01
TA-183	Not Detected	---------	1.74E-01
TC-99m	Not Detected	---------	5.01E+00
TL-201	Not Detected	---------	1.46E-01
XE-133	Not Detected	---------	1.55E-01
Y-88	Not Detected	---------	2.66E-02
ZN-65	Not Detected	---------	1.09E-01
ZR-95	Not Detected	---------	5.72E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 1-08-98 12:45:34 PM *
****
*
* Analyzed by: 1/8/98 Reviewed by: 1/9/98 *
****

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : 033259-004
Lab Sample ID : 80001607

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 800.000 gram
Sample Date/Time : 1-06-98 9:15:00 AM
Acquire Start Date/Time : 1-08-98 11:02:57 AM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.33E+00
TH-234	8.37E-01	4.32E-01	4.27E-01
RA-226	7.92E-01	4.14E-01	5.28E-01
PB-214	3.43E-01	8.55E-02	4.69E-02
BI-214	3.67E-01	1.03E-01	5.19E-02
PB-210	Not Detected	---	7.11E+00
TH-232	5.00E-01	2.54E-01	1.20E-01
RA-228	5.98E-01	2.51E-01	1.66E-01
AC-228	4.86E-01	1.62E-01	9.09E-02
TH-228	4.84E-01	3.40E-01	4.42E-01
RA-224	5.28E-01	2.24E-01	8.18E-02
PB-212	5.44E-01	9.60E-02	3.63E-02
BI-212	6.88E-01	4.20E-01	3.51E-01
TL-208	4.84E-01	2.82E-01	7.10E-02
U-235	Not Detected	---	1.86E-01
TH-231	Not Detected	---	2.00E+00
PA-231	Not Detected	---	3.22E+00
TH-227	Not Detected	---	3.20E-01
RA-223	Not Detected	---	1.40E-01
RN-219	Not Detected	---	3.53E-01
PB-211	Not Detected	---	8.33E-01
TL-207	Not Detected	---	1.61E+01
AM-241	Not Detected	---	1.76E-01
PU-239	Not Detected	---	3.02E+02
NP-237	~~3.19E-01~~	~~1.28E-01~~	1.97E-01 not detected
PA-233	Not Detected	---	5.08E-02
TH-229	Not Detected	---	1.81E-01

1/8/98

[Summary Report] - Sample ID: : 80001607

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.28E-02
AG-110m	Not Detected	---	4.24E-02
AM-243	Not Detected	---	5.00E-02
BA-133	Not Detected	---	4.08E-02
BE-7	Not Detected	---	2.57E-01
CD-109	Not Detected	---	8.41E-01
CD-115	Not Detected	---	1.11E-01
CE-139	Not Detected	---	2.33E-02
CE-141	Not Detected	---	4.23E-02
CE-144	Not Detected	---	1.68E-01
CO-56	Not Detected	---	3.59E-02
CO-57	Not Detected	---	2.25E-02
CO-58	Not Detected	---	3.46E-02
CO-60	Not Detected	---	4.00E-02
CR-51	Not Detected	---	2.28E-01
CS-134	Not Detected	---	4.33E-02
CS-137	9.66E-02	1.44E-01	2.43E-02
EU-152	Not Detected	---	6.75E-02
EU-154	Not Detected	---	1.97E-01
EU-155	Not Detected	---	1.01E-01
FE-59	Not Detected	---	8.68E-02
GD-153	Not Detected	---	7.48E-02
HG-203	Not Detected	---	2.90E-02
I-131	Not Detected	---	3.30E-02
IR-192	Not Detected	---	2.54E-02
K-40	2.11E+01	3.18E+00	2.40E-01
KR-85	Not Detected	---	8.26E+00
MN-52	Not Detected	---	4.22E-02
MN-54	Not Detected	---	3.71E-02
MO-99	Not Detected	---	4.14E-01
NA-22	Not Detected	---	4.64E-02
NA-24	Not Detected	---	3.36E-01
NB-95	Not Detected	---	2.13E-01
ND-147	Not Detected	---	2.24E-01
NI-57	Not Detected	---	1.33E-01
NP-239	Not Detected	---	9.04E-02
RU-103	Not Detected	---	3.02E-02
RU-106	Not Detected	---	2.80E-01
SB-122	Not Detected	---	6.68E-02
SB-124	Not Detected	---	2.96E-02
SB-125	Not Detected	---	8.38E-02
SN-113	Not Detected	---	3.62E-02
TA-182	Not Detected	---	1.68E-01
TA-183	Not Detected	---	1.99E-01
TC-99m	Not Detected	---	7.47E+00
TL-201	Not Detected	---	1.57E-01
XE-133	Not Detected	---	1.67E-01
Y-88	Not Detected	---	2.57E-02
ZN-65	Not Detected	---	1.15E-01
ZR-95	Not Detected	---	6.19E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 1-08-98 1:00:15 PM *
****
*
* Analyzed by: 1/8/98 Reviewed by: 1/9/98 *
****

Customer : C.BYRD/MAC (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 80001608

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 1-08-98 12:48:19 PM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 604 seconds

Comments:

****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	8.71E+03
TH-234	Not Detected	---	3.40E+03
RA-226	Not Detected	---	5.82E+03
PB-214	Not Detected	---	7.89E+02
BI-214	Not Detected	---	7.08E+02
PB-210	Not Detected	---	6.89E+04
TH-232	Not Detected	---	2.36E+03
RA-228	Not Detected	---	3.30E+03
AC-228	Not Detected	---	2.00E+03
TH-228	Not Detected	---	9.62E+04
RA-224	Not Detected	---	1.12E+03
PB-212	Not Detected	---	7.07E+03
BI-212	Not Detected	---	7.24E+04
TL-208	Not Detected	---	1.45E+04
U-235	Not Detected	---	1.57E+03
TH-231	Not Detected	---	2.14E+04
PA-231	Not Detected	---	3.35E+04
TH-227	Not Detected	---	2.61E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	6.44E+03
PB-211	Not Detected	---	1.47E+04
TL-207	Not Detected	---	2.73E+05
AM-241	8.58E+04	1.44E+04	1.47E+03
PU-239	Not Detected	---	2.49E+06
NP-237	Not Detected	---	1.76E+03
PA-233	Not Detected	---	6.66E+02
TH-229	Not Detected	---	1.38E+03

[Summary Report] - Sample ID: : 80001608

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	4.06E+02
AG-110m	Not Detected	---	2.84E+06
AM-243	Not Detected	---	4.40E+02
BA-133	Not Detected	---	7.77E+02
BE-7	Not Detected	---	2.63E+18
CD-109	3.30E+05	1.64E+05	2.01E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	1.15E+08
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	8.61E+05
CO-56	Not Detected	---	8.10E+12
CO-57	Not Detected	---	1.50E+05
CO-58	Not Detected	---	5.78E+13
CO-60	7.92E+04	1.12E+04	4.39E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	3.77E+03
CS-137	6.95E+04	9.33E+03	3.38E+02
EU-152	Not Detected	---	8.12E+02
EU-154	Not Detected	---	3.16E+03
EU-155	Not Detected	---	2.33E+03
FE-59	Not Detected	---	5.94E+20
GD-153	Not Detected	---	1.05E+06
HG-203	Not Detected	---	2.75E+19
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.58E+13
K-40	Not Detected	---	1.85E+03
KR-85	Not Detected	---	1.32E+05
MN-52	Not Detected	---	1.00E+26
MN-54	5.67E+04	9.28E+04	8.83E+04
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.78E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
NP-239	Not Detected	---	7.07E+02
RU-103	Not Detected	---	1.00E+26
RU-106	Not Detected	---	4.48E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	4.54E+15
SB-125	Not Detected	---	7.95E+03
SN-113	Not Detected	---	3.54E+09
TA-182	Not Detected	---	1.09E+10
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	5.45E+09
ZN-65	Not Detected	---	1.91E+06
ZR-95	Not Detected	---	1.49E+15

Feature 58B

Internal Lab

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC 601348

Batch No. 900194 SAR/WR No.

Dept. No./Mail Stop:	6134/1148	Date Samples Shipped:	SMO Use Only	Contract No.:	~~AJ-2480A~~ BCR
Project/Task Manager:	Caroline Byrd	Carrier/Waybill No.:		Case No.:	7213.220600
Project Name:	Foothill Test Area Site B/58	Lab Contact:	Fernando	SMO Authorization:	
Record Center Code:	ER/1333/58/DAT	Lab Destination:	AMIR	Bill To: Sandia National Laboratories	
Logbook Ref. No.:		SMO Contact/Phone:	Doug Salmi/844-3110	Supplier Services Dept.:	
Service Order No.	CFO655	Send Report to SMO:	Robert Rivera	P.O. Box 5800 MS 0154	
Location	NA				

RUSH

COPY

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Only Lab Sample ID
044265-004	S58BH1-GR-001-6-S	6	58	12699/922	s	M	500ml	NONE	G	SA	Gamma Spec	
044266-004	S58BH1-GR-002-10-S	10	58	12699/937	s	M	500ml	NONE	G	SA	Gamma Spec	
044267-004	S58BH1-GR-003-15-S	15	58	12699/956	s	M	500ml	NONE	G	SA	Gamma Spec	
044273-004	S58BH1-GR-103-0-SD	0	58	12699/956	S	M	500ml	NONE	G	SD	Gamma Spec	
044274-004	S58B-GR-101-5-S	5	58	12699/1130	S	M	500ml	NONE	G	SA	Gamma Spec	
044275-004	S58B-GR-102-10-S	10	58	12699/1231	S	M	500ml	NONE	G	SA	Gamma Spec	

RMMA ☒ Yes ☐ No Ref. No.

Sample Disposal ☒ Return to Client ☒ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush

Required Report Date

Special Instructions/QC Requirements

EDD ☐ Yes ☒ No

Raw Data Package ☐ Yes ☒ No

This COC releases COC 601347 and 601351

Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Chris Catechis	Ch. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	Bill Gibson	BG	MDM/6131/235-3841

1.Relinquished by	Ch. Catechis	Org. 6131	Date 1/27/99	Time 1505	4.Relinquished by	Org.	Date Time
1. Received by	Robert Rivera (SMO)	Org. 7578	Date 1/27/99	Time 1505	4. Received by	Org.	Date Time
2.Relinquished by	Robert Rivera (SMO)	Org. 7578	Date 1/27/99	Time 1514	5.Relinquished by	Org.	Date Time
2. Received by		Org. 7578	Date 1/27/99	Time 1514	5. Received by	Org.	Date Time
3.Relinquished by	for GLS	Org. SNL 7578	Date 1/28/99	Time 1010	6.Relinquished by	Org.	Date Time
3. Received by	Robert Rivera (SMO)	Org. 7578	Date 1/28/99	Time 1010	6. Received by	Org.	Date Time

Sample Analysis

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Shaded areas are for RPSD use only

Batch Log Number: 900194
Logged By:

To be completed by Customer

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Site 8/58
Phone: 845-0868 (SNO)
Date Results Needed: Rush 1/28/99
Suspect Isotopes: UNK
Other Information: 7213, 2206

Hazards/Special Instructions:

RUSH

COC # 601348

Analysis Type:
- ☑ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044265-004	Soil	12699/922	500 ml	Gamma Spec	01	<300	918g	
044266-004		12699/937			02	<300	882g	
044267-004		12699/956			03	<300	1023g	
044273-004		12699/456			04	<300	1033g	
044274-004		12699/1130			05	<300	845g	
044275-004		12699/1231			06	<300	787g	
				LCSY	07,08	N/A	N/A	

Relinquished by (SNO) 75783 Date 1/27/99 Time 1512 Received by Date 1/27/99 Time 1514
Relinquished by Date 1/28/99 Time 1010 Received by Date 1/28/99 Time 1014
Relinquished by Date Time Received by Date Time
Relinquished by Date Time Received by Date Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 8:32:11 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044265-004
Lab Sample ID : 90019401

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 918.000 gram
Sample Date/Time : 1/26/99 9:22:00 AM
Acquire Start Date/Time : 1/27/99 3:32:04 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.08E-001
RA-226	1.47E+000	7.24E-001	4.16E-001
PB-214	6.22E-001	1.21E-001	3.51E-002
BI-214	5.72E-001	2.72E-001	3.52E-002
PB-210	Not Detected	---	2.96E+001
TH-232	5.75E-001	3.24E-001	1.18E-001
RA-228	6.51E-001	2.35E-001	1.11E-001
AC-228	5.62E-001	1.65E-001	6.12E-002
TH-228	7.18E-001	4.61E-001	3.39E-001
RA-224	6.51E-001	1.63E-001	5.53E-002
PB-212	6.56E-001	1.18E-001	3.03E-002
BI-212	7.64E-001	4.00E-001	2.09E-001
TL-208	5.87E-001	1.33E-001	4.59E-002
U-235	Not Detected	---	1.77E-001
TH-231	Not Detected	---	1.15E+000
PA-231	Not Detected	---	1.03E+000
TH-227	Not Detected	---	2.80E-001
RA-223	Not Detected	---	1.64E-001
RN-219	Not Detected	---	2.66E-001
PB-211	Not Detected	---	6.12E-001
TL-207	Not Detected	---	9.77E+000
AM-241	Not Detected	---	3.88E-001
PU-239	Not Detected	---	3.29E+002
NP-237	~~4.67E-001~~	~~2.59E-001~~	2.43E-001 Not detected
PA-233	Not Detected	---	4.25E-002
TH-229	Not Detected	---	2.10E-001

1/28/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019401

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.62E-002
AG-110m	Not Detected	---	2.16E-002
BA-133	Not Detected	---	4.61E-002
BE-7	Not Detected	---	1.84E-001
CD-109	Not Detected	---	8.23E-001
CD-115	Not Detected	---	7.21E-002
CE-139	Not Detected	---	2.24E-002
CE-141	Not Detected	---	3.97E-002
CE-144	Not Detected	---	1.83E-001
CO-56	Not Detected	---	2.30E-002
CO-57	Not Detected	---	2.33E-002
CO-58	Not Detected	---	2.24E-002
CO-60	Not Detected	---	2.54E-002
CR-51	Not Detected	---	1.66E-001
CS-134	Not Detected	---	2.72E-002
CS-137	Not Detected	---	2.40E-002
EU-152	Not Detected	---	6.92E-002
EU-154	Not Detected	---	1.28E-001
EU-155	Not Detected	---	1.17E-001
FE-59	Not Detected	---	5.32E-002
GD-153	Not Detected	---	8.86E-002
HG-203	Not Detected	---	2.29E-002
I-131	Not Detected	---	2.23E-002
IR-192	Not Detected	---	2.01E-002
K-40	1.55E+001	2.24E+000	1.91E-001
MN-52	Not Detected	---	2.48E-002
MN-54	Not Detected	---	2.63E-002
MO-99	Not Detected	---	2.32E-001
NA-22	Not Detected	---	2.86E-002
NA-24	Not Detected	---	9.72E-002
NB-95	Not Detected	---	1.53E-001
ND-147	Not Detected	---	1.52E-001
NI-57	Not Detected	---	4.70E-002
RU-103	Not Detected	---	2.05E-002
RU-106	Not Detected	---	1.93E-001
SB-122	Not Detected	---	3.95E-002
SB-124	Not Detected	---	2.09E-002
SB-125	Not Detected	---	6.17E-002
SN-113	Not Detected	---	2.71E-002
SR-85	Not Detected	---	2.63E-002
TA-182	Not Detected	---	1.14E-001
TA-183	Not Detected	---	3.91E-001
TC-99m	Not Detected	---	7.38E-001
TL-201	Not Detected	---	1.85E-001
XE-133	Not Detected	---	1.60E-001
Y-88	Not Detected	---	1.89E-002
ZN-65	Not Detected	---	7.43E-002
ZR-95	Not Detected	---	3.95E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 8:40:40 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044266-004
Lab Sample ID : 90019402

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 882.000 gram
Sample Date/Time : 1/26/99 9:37:00 AM
Acquire Start Date/Time : 1/27/99 5:24:09 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.19E-001
RA-226	1.36E+000	6.15E-001	4.52E-001
PB-214	6.00E-001	1.87E-001	3.58E-002
BI-214	5.69E-001	2.06E-001	3.61E-002
PB-210	Not Detected	---	2.92E+001
TH-232	6.67E-001	3.42E-001	9.78E-002
RA-228	6.22E-001	2.04E-001	1.10E-001
AC-228	6.19E-001	1.79E-001	6.54E-002
TH-228	6.61E-001	2.10E-001	3.94E-001
RA-224	6.52E-001	1.64E-001	5.03E-002
PB-212	6.72E-001	1.17E-001	3.30E-002
BI-212	6.59E-001	3.80E-001	2.42E-001
TL-208	6.29E-001	1.45E-001	4.82E-002
U-235	9.43E-002	1.47E-001	1.87E-001
TH-231	Not Detected	---	1.18E+000
PA-231	Not Detected	---	1.07E+000
TH-227	Not Detected	---	2.91E-001
RA-223	Not Detected	---	1.67E-001
RN-219	Not Detected	---	2.80E-001
PB-211	Not Detected	---	6.45E-001
TL-207	Not Detected	---	1.04E+001
AM-241	Not Detected	---	3.96E-001
PU-239	Not Detected	---	3.29E+002
NP-237	Not Detected	---	2.39E-001
PA-233	Not Detected	---	4.27E-002
TH-229	Not Detected	---	2.13E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019402

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.62E-002
AG-110m	Not Detected	---	2.42E-002
BA-133	Not Detected	---	4.73E-002
BE-7	Not Detected	---	1.83E-001
CD-109	Not Detected	---	8.10E-001
CD-115	Not Detected	---	7.64E-002
CE-139	Not Detected	---	2.31E-002
CE-141	Not Detected	---	4.13E-002
CE-144	Not Detected	---	1.83E-001
CO-56	Not Detected	---	2.49E-002
CO-57	Not Detected	---	2.32E-002
CO-58	Not Detected	---	2.50E-002
CO-60	Not Detected	---	2.72E-002
CR-51	Not Detected	---	1.80E-001
CS-134	Not Detected	---	2.71E-002
CS-137	2.44E-002	2.47E-002	1.63E-002
EU-152	Not Detected	---	6.97E-002
EU-154	Not Detected	---	1.27E-001
EU-155	Not Detected	---	1.18E-001
FE-59	Not Detected	---	5.30E-002
GD-153	Not Detected	---	8.86E-002
HG-203	Not Detected	---	2.38E-002
I-131	Not Detected	---	2.34E-002
IR-192	Not Detected	---	2.04E-002
K-40	1.52E+001	2.19E+000	1.91E-001
MN-52	Not Detected	---	2.62E-002
MN-54	Not Detected	---	2.66E-002
MO-99	Not Detected	---	2.36E-001
NA-22	Not Detected	---	3.03E-002
NA-24	Not Detected	---	1.07E-001
NB-95	Not Detected	---	1.63E-001
ND-147	Not Detected	---	1.56E-001
NI-57	Not Detected	---	6.79E-002
RU-103	Not Detected	---	2.07E-002
RU-106	Not Detected	---	2.09E-001
SB-122	Not Detected	---	4.21E-002
SB-124	Not Detected	---	2.13E-002
SB-125	Not Detected	---	6.50E-002
SN-113	Not Detected	---	2.79E-002
SR-85	Not Detected	---	2.71E-002
TA-182	Not Detected	---	1.20E-001
TA-183	Not Detected	---	4.06E-001
TC-99m	Not Detected	---	9.39E-001
TL-201	Not Detected	---	1.87E-001
XE-133	Not Detected	---	1.70E-001
Y-88	Not Detected	---	1.78E-002
ZN-65	Not Detected	---	7.67E-002
ZR-95	Not Detected	---	4.08E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 7:32:33 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044267-004
Lab Sample ID : 90019403

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 1023.000 gram
Sample Date/Time : 1/26/99 9:56:00 AM
Acquire Start Date/Time : 1/28/99 5:52:18 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	5.66E-001
RA-226	1.36E+000	6.71E-001	4.40E-001
PB-214	5.64E-001	1.09E-001	3.20E-002
BI-214	4.72E-001	7.84E-002	3.29E-002
PB-210	Not Detected	---------	2.53E+001
TH-232	5.14E-001	2.89E-001	9.99E-002
RA-228	6.39E-001	2.15E-001	1.03E-001
AC-228	5.52E-001	1.50E-001	6.14E-002
TH-228	4.77E-001	4.65E-001	3.50E-001
RA-224	6.41E-001	1.56E-001	2.23E-002
PB-212	5.38E-001	9.89E-002	2.80E-002
BI-212	6.89E-001	1.39E-001	2.17E-001
TL-208	5.27E-001	1.06E-001	4.49E-002
U-235	9.50E-002	1.31E-001	1.66E-001
TH-231	Not Detected	---------	1.08E+000
PA-231	Not Detected	---------	9.83E-001
TH-227	Not Detected	---------	2.50E-001
RA-223	Not Detected	---------	1.56E-001
RN-219	Not Detected	---------	2.60E-001
PB-211	Not Detected	---------	5.83E-001
TL-207	Not Detected	---------	9.41E+000
AM-241	Not Detected	---------	3.43E-001
PU-239	Not Detected	---------	3.05E+002
NP-237	~~4.15E-001~~	~~1.97E-001~~	2.41E-001 Not detected
PA-233	Not Detected	---------	4.04E-002
TH-229	Not Detected	---------	1.95E-001

1/28/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019403

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.40E-002
AG-110m	Not Detected	---	2.04E-002
BA-133	Not Detected	---	4.17E-002
BE-7	Not Detected	---	1.75E-001
CD-109	Not Detected	---	8.19E-001
CD-115	Not Detected	---	7.67E-002
CE-139	Not Detected	---	2.09E-002
CE-141	Not Detected	---	3.70E-002
CE-144	Not Detected	---	1.61E-001
CO-56	Not Detected	---	2.31E-002
CO-57	Not Detected	---	2.17E-002
CO-58	Not Detected	---	2.12E-002
CO-60	Not Detected	---	2.65E-002
CR-51	Not Detected	---	1.58E-001
CS-134	Not Detected	---	2.44E-002
CS-137	Not Detected	---	2.28E-002
EU-152	Not Detected	---	6.47E-002
EU-154	Not Detected	---	1.16E-001
EU-155	Not Detected	---	1.09E-001
FE-59	Not Detected	---	4.93E-002
GD-153	Not Detected	---	8.05E-002
HG-203	Not Detected	---	2.20E-002
I-131	Not Detected	---	2.26E-002
IR-192	Not Detected	---	1.81E-002
K-40	1.65E+001	2.38E+000	1.69E-001
MN-52	Not Detected	---	2.40E-002
MN-54	Not Detected	---	2.27E-002
MO-99	Not Detected	---	2.47E-001
NA-22	Not Detected	---	2.91E-002
NA-24	Not Detected	---	1.78E-001
NB-95	Not Detected	---	1.55E-001
ND-147	Not Detected	---	1.42E-001
NI-57	Not Detected	---	8.23E-002
RU-103	Not Detected	---	1.86E-002
RU-106	Not Detected	---	1.85E-001
SB-122	Not Detected	---	4.08E-002
SB-124	Not Detected	---	2.00E-002
SB-125	Not Detected	---	5.73E-002
SN-113	Not Detected	---	2.51E-002
SR-85	Not Detected	---	2.45E-002
TA-182	Not Detected	---	1.10E-001
TA-183	Not Detected	---	3.72E-001
TC-99m	Not Detected	---	3.41E+000
TL-201	Not Detected	---	1.96E-001
XE-133	Not Detected	---	1.84E-001
Y-88	Not Detected	---	1.54E-002
ZN-65	Not Detected	---	7.10E-002
ZR-95	Not Detected	---	3.80E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:11:23 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044273-004
Lab Sample ID : 90019404

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 1033.000 gram
Sample Date/Time : 1/26/99 9:56:00 AM
Acquire Start Date/Time : 1/28/99 6:05:52 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.42E-001
RA-226	1.27E+000	5.94E-001	3.99E-001
PB-214	5.43E-001	1.13E-001	3.83E-002
BI-214	4.65E-001	1.11E-001	3.76E-002
PB-210	Not Detected	---------	3.36E+000
TH-232	5.12E-001	2.86E-001	1.11E-001
RA-228	5.55E-001	5.65E-001	1.27E-001
AC-228	5.39E-001	9.67E-002	6.72E-002
TH-228	6.11E-001	2.21E-001	3.83E-001
RA-224	Not Detected	---------	2.03E-001
PB-212	5.42E-001	9.84E-002	2.99E-002
BI-212	7.52E-001	4.49E-001	2.70E-001
TL-208	5.03E-001	2.96E-001	5.85E-002
U-235	Not Detected	---------	1.61E-001
TH-231	Not Detected	---------	8.37E-001
PA-231	Not Detected	---------	1.08E+000
TH-227	Not Detected	---------	2.65E-001
RA-223	Not Detected	---------	1.01E-001
RN-219	Not Detected	---------	3.04E-001
PB-211	Not Detected	---------	6.89E-001
TL-207	Not Detected	---------	1.25E+001
AM-241	Not Detected	---------	1.21E-001
PU-239	Not Detected	---------	2.66E+002
NP-237	~~4.95E-001~~	~~2.61E-001~~	1.57E-001 Not Detected 1/28/99
PA-233	Not Detected	---------	4.49E-002
TH-229	Not Detected	---------	1.48E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019404

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.32E-002
AG-110m	Not Detected	---	2.63E-002
BA-133	Not Detected	---	4.56E-002
BE-7	Not Detected	---	1.92E-001
CD-109	Not Detected	---	7.06E-001
CD-115	Not Detected	---	8.87E-002
CE-139	Not Detected	---	2.08E-002
CE-141	Not Detected	---	3.60E-002
CE-144	Not Detected	---	1.42E-001
CO-56	Not Detected	---	2.63E-002
CO-57	Not Detected	---	1.82E-002
CO-58	Not Detected	---	2.55E-002
CO-60	Not Detected	---	3.27E-002
CR-51	Not Detected	---	1.94E-001
CS-134	Not Detected	---	4.25E-002
CS-137	Not Detected	---	2.84E-002
EU-152	Not Detected	---	5.46E-002
EU-154	Not Detected	---	1.53E-001
EU-155	Not Detected	---	8.49E-002
FE-59	Not Detected	---	6.73E-002
GD-153	Not Detected	---	6.03E-002
HG-203	Not Detected	---	2.46E-002
I-131	Not Detected	---	2.62E-002
IR-192	Not Detected	---	2.17E-002
K-40	1.54E+001	2.35E+000	3.52E-001
MN-52	Not Detected	---	3.32E-002
MN-54	Not Detected	---	1.40E-002
MO-99	Not Detected	---	3.18E-001
NA-22	Not Detected	---	3.95E-002
NA-24	Not Detected	---	1.98E-001
NB-95	Not Detected	---	1.70E-001
ND-147	Not Detected	---	1.88E-001
NI-57	Not Detected	---	9.91E-002
RU-103	Not Detected	---	2.34E-002
RU-106	Not Detected	---	2.32E-001
SB-122	Not Detected	---	5.39E-002
SB-124	Not Detected	---	2.54E-002
SB-125	Not Detected	---	6.67E-002
SN-113	Not Detected	---	3.05E-002
SR-85	Not Detected	---	2.86E-002
TA-182	Not Detected	---	1.38E-001
TA-183	Not Detected	---	1.32E-001
TC-99m	Not Detected	---	3.39E+000
TL-201	Not Detected	---	1.01E-001
XE-133	Not Detected	---	1.13E-001
Y-88	Not Detected	---	2.19E-002
ZN-65	Not Detected	---	9.41E-002
ZR-95	Not Detected	---	4.92E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:22:46 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044274-004
Lab Sample ID : 90019405

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 842.000 gram
Sample Date/Time : 1/26/99 11:30:00 AM
Acquire Start Date/Time : 1/28/99 7:33:47 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.59E-001
RA-226	4.60E-001	3.10E-001	3.73E-001
PB-214	2.92E-001	7.62E-002	2.97E-002
BI-214	2.58E-001	7.04E-002	3.00E-002
PB-210	Not Detected	---------	2.29E+001
TH-232	3.41E-001	2.16E-001	9.42E-002
RA-228	2.93E-001	1.28E-001	8.67E-002
AC-228	2.86E-001	1.25E-001	5.00E-002
TH-228	3.64E-001	1.77E-001	3.10E-001
RA-224	3.22E-001	9.44E-002	5.07E-002
PB-212	3.22E-001	7.24E-002	2.58E-002
BI-212	2.16E-001	2.03E-001	1.98E-001
TL-208	2.52E-001	2.06E-001	3.80E-002
U-235	Not Detected	---------	1.41E-001
TH-231	Not Detected	---------	8.86E-001
PA-231	Not Detected	---------	8.53E-001
TH-227	Not Detected	---------	2.14E-001
RA-223	Not Detected	---------	1.33E-001
RN-219	Not Detected	---------	2.18E-001
PB-211	Not Detected	---------	4.98E-001
TL-207	Not Detected	---------	8.06E+000
AM-241	Not Detected	---------	3.06E-001
PU-239	Not Detected	---------	2.59E+002
NP-237	Not Detected	---------	2.23E-001
PA-233	Not Detected	---------	3.41E-002
TH-229	Not Detected	---------	1.60E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019405

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.10E-002
AG-110m	Not Detected	---	1.66E-002
BA-133	Not Detected	---	3.41E-002
BE-7	Not Detected	---	1.50E-001
CD-109	Not Detected	---	7.57E-001
CD-115	Not Detected	---	6.70E-002
CE-139	Not Detected	---	1.83E-002
CE-141	Not Detected	---	3.12E-002
CE-144	Not Detected	---	1.42E-001
CO-56	Not Detected	---	2.14E-002
CO-57	Not Detected	---	1.89E-002
CO-58	Not Detected	---	1.92E-002
CO-60	Not Detected	---	2.27E-002
CR-51	Not Detected	---	1.53E-001
CS-134	Not Detected	---	2.04E-002
CS-137	Not Detected	---	1.87E-002
EU-152	Not Detected	---	5.64E-002
EU-154	Not Detected	---	9.93E-002
EU-155	Not Detected	---	8.97E-002
FE-59	Not Detected	---	4.49E-002
GD-153	Not Detected	---	6.55E-002
HG-203	Not Detected	---	1.91E-002
I-131	Not Detected	---	1.99E-002
IR-192	Not Detected	---	1.63E-002
K-40	9.41E+000	1.44E+000	1.82E-001
MN-52	Not Detected	---	2.31E-002
MN-54	Not Detected	---	2.04E-002
MO-99	Not Detected	---	2.24E-001
NA-22	Not Detected	---	2.55E-002
NA-24	Not Detected	---	1.65E-001
NB-95	Not Detected	---	1.33E-001
ND-147	Not Detected	---	1.31E-001
NI-57	Not Detected	---	7.05E-002
RU-103	Not Detected	---	1.68E-002
RU-106	Not Detected	---	1.86E-001
SB-122	Not Detected	---	3.80E-002
SB-124	Not Detected	---	1.69E-002
SB-125	Not Detected	---	5.12E-002
SN-113	Not Detected	---	2.37E-002
SR-85	Not Detected	---	2.21E-002
TA-182	Not Detected	---	8.58E-002
TA-183	Not Detected	---	3.37E-001
TC-99m	Not Detected	---	3.00E+000
TL-201	Not Detected	---	1.61E-001
XE-133	Not Detected	---	1.53E-001
Y-88	Not Detected	---	1.60E-002
ZN-65	Not Detected	---	5.91E-002
ZR-95	Not Detected	---	3.17E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:41:55 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044275-004
Lab Sample ID : 90019406

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 787.000 gram
Sample Date/Time : 1/26/99 12:31:00 PM
Acquire Start Date/Time : 1/28/99 7:48:01 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.16E-001
RA-226	5.91E-001	5.41E-001	3.89E-001
PB-214	2.99E-001	8.69E-002	3.56E-002
BI-214	2.33E-001	8.50E-002	4.25E-002
PB-210	Not Detected	---------	3.62E+000
TH-232	4.13E-001	2.54E-001	1.34E-001
RA-228	3.78E-001	2.55E-001	1.46E-001
AC-228	3.37E-001	1.60E-001	7.55E-002
TH-228	5.28E-001	1.40E-001	3.95E-001
RA-224	Not Detected	---------	2.23E-001
PB-212	3.83E-001	8.12E-002	3.07E-002
BI-212	5.03E-001	3.32E-001	2.15E-001
TL-208	3.71E-001	1.33E-001	5.28E-002
U-235	Not Detected	---------	1.52E-001
TH-231	Not Detected	---------	7.95E-001
PA-231	Not Detected	---------	1.02E+000
TH-227	Not Detected	---------	2.60E-001
RA-223	Not Detected	---------	9.86E-002
RN-219	Not Detected	---------	3.05E-001
PB-211	Not Detected	---------	7.21E-001
TL-207	Not Detected	---------	1.28E+001
AM-241	Not Detected	---------	1.18E-001
PU-239	Not Detected	---------	2.62E+002
NP-237	Not Detected	---------	1.43E-001
PA-233	Not Detected	---------	4.57E-002
TH-229	Not Detected	---------	1.39E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019406

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.37E-002
AG-110m	Not Detected	---	2.51E-002
BA-133	Not Detected	---	4.10E-002
BE-7	Not Detected	---	2.00E-001
CD-109	Not Detected	---	6.52E-001
CD-115	Not Detected	---	9.06E-002
CE-139	Not Detected	---	1.95E-002
CE-141	Not Detected	---	3.41E-002
CE-144	Not Detected	---	1.34E-001
CO-56	Not Detected	---	2.97E-002
CO-57	Not Detected	---	1.72E-002
CO-58	Not Detected	---	2.78E-002
CO-60	Not Detected	---	3.11E-002
CR-51	Not Detected	---	1.87E-001
CS-134	Not Detected	---	3.89E-002
CS-137	Not Detected	---	2.64E-002
EU-152	Not Detected	---	5.16E-002
EU-154	Not Detected	---	1.55E-001
EU-155	Not Detected	---	8.03E-002
FE-59	Not Detected	---	6.86E-002
GD-153	Not Detected	---	5.64E-002
HG-203	Not Detected	---	2.20E-002
I-131	Not Detected	---	2.71E-002
IR-192	Not Detected	---	2.22E-002
K-40	1.23E+001	2.03E+000	4.31E-001
MN-52	Not Detected	---	3.59E-002
MN-54	Not Detected	---	3.11E-002
MO-99	Not Detected	---	3.42E-001
NA-22	Not Detected	---	3.84E-002
NA-24	Not Detected	---	2.25E-001
NB-95	Not Detected	---	1.66E-001
ND-147	Not Detected	---	1.97E-001
NI-57	Not Detected	---	1.08E-001
RU-103	Not Detected	---	2.39E-002
RU-106	Not Detected	---	2.42E-001
SB-122	Not Detected	---	5.44E-002
SB-124	Not Detected	---	2.67E-002
SB-125	Not Detected	---	6.60E-002
SN-113	Not Detected	---	3.01E-002
SR-85	Not Detected	---	3.10E-002
TA-182	Not Detected	---	1.32E-001
TA-183	Not Detected	---	1.27E-001
TC-99m	Not Detected	---	2.86E+000
TL-201	Not Detected	---	9.14E-002
XE-133	Not Detected	---	1.05E-001
Y-88	Not Detected	---	2.05E-002
ZN-65	Not Detected	---	9.08E-002
ZR-95	Not Detected	---	5.15E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:25:49 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90019407

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/28/99 9:15:34 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 606 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	4.19E+003
RA-226	Not Detected	---------	5.72E+003
PB-214	Not Detected	---------	6.37E+002
BI-214	Not Detected	---------	5.71E+002
PB-210	Not Detected	---------	2.74E+005
TH-232	Not Detected	---------	1.90E+003
RA-228	Not Detected	---------	2.18E+003
AC-228	Not Detected	---------	1.33E+003
TH-228	Not Detected	---------	1.23E+005
RA-224	Not Detected	---------	5.36E+003
PB-212	Not Detected	---------	9.18E+003
BI-212	Not Detected	---------	7.11E+004
TL-208	Not Detected	---------	1.68E+004
U-235	Not Detected	---------	1.54E+003
TH-231	Not Detected	---------	9.67E+003
PA-231	Not Detected	---------	1.30E+004
TH-227	Not Detected	---------	2.37E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	5.32E+003
PB-211	Not Detected	---------	1.20E+004
TL-207	Not Detected	---------	1.93E+005
AM-241	8.07E+004	1.51E+004	2.93E+003
PU-239	Not Detected	---------	2.73E+006
NP-237	Not Detected	---------	2.15E+003
PA-233	Not Detected	---------	5.38E+002
TH-229	Not Detected	---------	1.76E+003

[Summary Report] - Sample ID: : 90019407

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	2.77E+002
AG-110m	Not Detected	---	6.08E+006
BA-133	Not Detected	---	6.82E+002
BE-7	Not Detected	---	3.17E+020
CD-109	Not Detected	---	6.52E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	8.16E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.40E+006
CO-56	Not Detected	---	1.78E+014
CO-57	Not Detected	---	4.54E+005
CO-58	Not Detected	---	1.82E+015
CO-60	8.20E+004	1.11E+004	4.00E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.08E+003
CS-137	7.09E+004	9.42E+003	2.60E+002
EU-152	Not Detected	---	9.59E+002
EU-154	Not Detected	---	2.37E+003
EU-155	Not Detected	---	3.32E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	4.06E+006
HG-203	Not Detected	---	7.52E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	4.84E+014
K-40	Not Detected	---	1.40E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	2.50E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.78E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	7.58E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	2.85E+017
SB-125	Not Detected	---	8.43E+003
SN-113	Not Detected	---	2.99E+010
SR-85	Not Detected	---	3.09E+016
TA-182	Not Detected	---	7.61E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	4.39E+010
ZN-65	Not Detected	---	3.95E+006
ZR-95	Not Detected	---	6.57E+016

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 1/28/99 9:25:51 AM
QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 90019407
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/28/99 9:15:34 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.190E-002	4.074E-003	8.069E-002	<	:	:	: >
CS-137 Activity	7.057E-002	1.981E-003	7.094E-002	<	:	:	: >
CO-60 Activity	7.854E-002	2.171E-003	8.045E-002	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 1/28/99

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:39:28 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/98

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90019408

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/28/99 9:29:14 AM
Detector Name : LAB03
Elapsed Live/Real Time : 600 / 606 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.92E+003
RA-226	Not Detected	---	5.97E+003
PB-214	Not Detected	---	7.64E+002
BI-214	Not Detected	---	6.94E+002
PB-210	Not Detected	---	4.59E+004
TH-232	Not Detected	---	2.35E+003
RA-228	Not Detected	---	3.15E+003
AC-228	Not Detected	---	1.82E+003
TH-228	Not Detected	---	1.47E+005
RA-224	Not Detected	---	4.11E+003
PB-212	Not Detected	---	9.71E+003
BI-212	Not Detected	---	9.95E+004
TL-208	Not Detected	---	2.15E+004
U-235	Not Detected	---	1.45E+003
TH-231	Not Detected	---	6.97E+003
PA-231	Not Detected	---	1.50E+004
TH-227	Not Detected	---	2.49E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.69E+003
PB-211	Not Detected	---	1.52E+004
TL-207	Not Detected	---	2.64E+005
AM-241	8.76E+004	1.48E+004	1.22E+003
PU-239	Not Detected	---	2.33E+006
NP-237	Not Detected	---	1.34E+003
PA-233	Not Detected	---	6.76E+002
TH-229	Not Detected	---	1.25E+003

[Summary Report] - Sample ID: : 90019408

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.79E+002
AG-110m	Not Detected	---	8.03E+006
BA-133	Not Detected	---	8.26E+002
BE-7	Not Detected	---	3.76E+020
CD-109	3.53E+005	3.53E+005	2.99E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	7.99E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.00E+006
CO-56	Not Detected	---	2.38E+014
CO-57	Not Detected	---	3.77E+005
CO-58	Not Detected	---	2.24E+015
CO-60	8.31E+004	1.17E+004	4.98E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	5.30E+003
CS-137	7.16E+004	9.58E+003	2.97E+002
EU-152	Not Detected	---	8.03E+002
EU-154	Not Detected	---	3.22E+003
EU-155	Not Detected	---	2.39E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	2.82E+006
HG-203	Not Detected	---	8.34E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	5.93E+014
K-40	Not Detected	---	1.40E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	3.34E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	2.20E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	9.57E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	3.76E+017
SB-125	Not Detected	---	9.85E+003
SN-113	Not Detected	---	3.67E+010
SR-85	Not Detected	---	3.69E+016
TA-182	Not Detected	---	9.93E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	5.84E+010
ZN-65	Not Detected	---	5.09E+006
ZR-95	Not Detected	---	8.76E+016

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 1/28/99 9:39:30 AM
QA File : C:\GENIE2K\CAMFILES\LCS3.QAF
Analyst : FCD
Sample ID : 90019408
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/28/99 9:29:14 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.693E-002	1.868E-003	8.762E-002	<	:	:	: >
CS-137 Activity	6.935E-002	1.982E-003	7.155E-002	<	:	:	: >
CO-60 Activity	7.941E-002	2.071E-003	8.152E-002	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____ 1/28/99

Survey Number: S15885

RADIOLOGICAL SURVEY FORM

Location	Requestor/Dept.	Date	Time	Duration
ER Site #58B	Mike Young #6134	012699	1545	N/A

Purpose	Request #	RWP #	RPR #
Release the exterior of soil samples only.	N/A	RWP0309	N/A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP-260/#983	N/A	John P. Kilbane	John P. Kilbane
Bicron Micro Rem #B973D	N/A	N/A	N/A
N/A	N/A	N/A	N/A

#	Item Description/Location	BETA-GAMMA CONTAMINATION (Counting Data Attached ☒ Yes ☐ No) %Eff. cpm	2σ Bkg cpm	/Radionuclide dpm / 100 cm² (1)	DU (2) T/R/F	ALPHA CONTAMINATION (Counting Data Attached ☒ Yes ☐ No) %Eff cpm	N/A Bkg cpm	/Radionuclide dpm / 100 cm² (1)	DU (2) T/R/F	RADIATION SURVEY Bkg μrem/hr (3)	μrem/hr Distance
1	Sample #'S=044274-001,044274-002,044274-003(1of2 & 2of2),044274-004	≤80	80	ND	T				R	≤7	Contact
2	Sample #'S=044275-001,044275-002,044275-003(1of2 & 2of2),044275-004	≤80	80	ND	T				R	≤7	Contact
3	Sample #'S=044273-001,044273-002,044273-004	≤80	80	ND	T				R	≤7	Contact
4	Sample #'S=044265-001,044265-002,044265-004	≤80	80	ND	T				R	≤7	Contact
5	Sample #'S=044267-001,044267-002,044267-004	≤80	80	ND	T				R	≤7	Contact
6	Sample #'S=044266-001,044266-002,044266004	≤80	80	ND	T				R	≤7	Contact
7	Sample #'S=044277-008(1of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
8	Sample #'S=044277-006(1of3, 2of3 & 3of3)	≤80	80	ND	T				R	≤7	Contact
9	Sample #'S=044277-010 (1of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
10	Sample #'S=044277-005 (1of3, 2of3 & 3of3)	≤80	80	ND	T				R	≤7	Contact
11	Sample #'S=044277-007 (1of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
12	Sample #'S=044277-011(1of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
						N					
						A					

Note (1) If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, of other than gamma (i.e., η or β).

COPY

Remarks

Reviewed by Date:

****
* Sandia Radioactive Sample Diagnostics Program 1-27-1999 *
****
LSC Analysis Program - version 5.3

2-4
#515885

Batch Number : 93007801
Count Protocol : 3
Client : ER58B SAMPLES 1/26/99 JP KILBANE 7526 93007801
Laboratory ID : 6921 - S#411293
Count Date : 26-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 0-12
Count Time : 5.0 minutes
Background cpm : 25.00 +- 5.61
Background tSIE : 458.8
Background Eff : 0.411
Systematic Error : 12.90%
Sample Aliquot : 1.000 f

H-3 MDA = 2.67E+01 dpm/f
H-3 CL = 1.27E+01 dpm/f

H-3 Efficiency = 0.9740 - exp(-0.00047*tSIE^1.1600)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 3-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
©CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: RT Preston 1/27/99 Reviewed by: RT Preston 1/27/99

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity dpm/f	Error	Flag
2	001	001	2.02E+01	4.40E+00	416	0.375	-1.28E+01	2.84E+01	<CL
3	002	002	2.30E+01	4.58E+00	431	0.388	-5.15E+00	2.69E+01	<CL
4	003	003	1.90E+01	4.29E+00	414	0.373	-1.39E+01	2.83E+01	<CL
5	004	004	2.22E+01	4.58E+00	405	0.366	-7.65E+00	2.88E+01	<CL
6	005	005	2.20E+01	4.53E+00	411	0.371	-8.09E+00	2.84E+01	<CL
7	006	006	1.96E+01	4.35E+00	413	0.372	-1.45E+01	2.86E+01	<CL
8	007	007	1.94E+01	4.44E+00	430	0.387	-1.45E+01	2.79E+01	<CL
9	008	008	2.12E+01	4.70E+00	419	0.377	-1.01E+01	2.86E+01	<CL
10	009	009	2.06E+01	4.65E+00	428	0.385	-1.14E+01	2.81E+01	<CL
11	010	010	1.96E+01	4.42E+00	423	0.381	-1.42E+01	2.82E+01	<CL
12	011	011	2.22E+01	4.72E+00	422	0.380	-7.37E+00	2.81E+01	<CL
13	013	012	2.10E+01	4.44E+00	390	0.360	-1.11E+01	2.94E+01	<CL

COPY

****
* Sandia Radioactive Sample Diagnostics Program 1-27 1999 *
****
LSC Analysis Program - version 5.3

3-4
#515885

Batch Number : 93007801
Count Protocol : 3
Client : ER58B SAMPLES 1/26/99 JP KILBANE 7526 93007801
Laboratory ID : 6921 - S#411293
Count Date : 26-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 20-600
Count Time : 5.0 minutes
Background cpm : 3.20 +- 1.60
Background tSIE : 458.8
Background Eff : 1.039
Systematic Error : 8.90%
Sample Aliquot : 1.000 f

Alpha MDA = 4.11E+00 dpm/f
Alpha CL = 1.79E+00 dpm/f

Alpha Efficiency = 1.0390 - exp(-0.00990*tSIE^1.1780)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity dpm/f	Error	Flag
2	001	001	3.00E+00	1.55E+00	416	1.039	-1.92E-01	3.05E+00	<CL
3	002	002	3.20E+00	1.60E+00	431	1.039	0.00E+00	3.08E+00	<CL
4	003	003	2.00E+00	1.26E+00	414	1.039	-1.15E+00	2.86E+00	<CL
5	004	004	2.40E+00	1.39E+00	405	1.039	-7.70E-01	2.94E+00	<CL
6	005	005	2.60E+00	1.44E+00	411	1.039	-5.77E-01	2.98E+00	<CL
7	006	006	3.20E+00	1.60E+00	413	1.039	0.00E+00	3.08E+00	<CL
8	007	007	3.20E+00	1.60E+00	430	1.039	0.00E+00	3.08E+00	<CL
9	008	008	2.20E+00	1.33E+00	419	1.039	-9.62E-01	2.90E+00	<CL
10	009	009	2.60E+00	1.44E+00	428	1.039	-5.77E-01	2.98E+00	<CL
11	010	010	3.60E+00	1.70E+00	423	1.039	3.85E-01	3.21E+00	<CL
12	011	011	1.40E+00	1.06E+00	422	1.039	-1.73E+00	2.71E+00	<CL
13	012	012	2.60E+00	1.44E+00	398	1.039	-5.77E-01	2.98E+00	<CL

COPY

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program            1-27-1999 *
**********************************************************************
LSC Analysis Program - version 5.3                                4-4
                                                                  #515885
Batch Number        : 93007801
Count Protocol      : 3
Client              : ERS8B SAMPLES 1/26/99 JP KILBANE 7526      93007801
Laboratory ID       : 6921 - S#411293
Count Date          : 26-Jan-99
Protocol Name       : H3AB -- SWIPE
Region of Interest  : 12-2000
Count Time          : 5.0 minutes
Background cpm      : 37.40 +- 5.47
Background tSIE     : 458.8
Background Eff      : 0.841
Systematic Error    :  6.30%
Sample Aliquot      : 1.000 f

Beta MDA =  1.58E+01 dpm/f
Beta CL  =  7.58E+00 dpm/f

Beta Efficiency = 0.8410 - exp(-0.01319*tSIE^1.1040)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
2	001	001	4.06E+01	5.70E+00	416	0.841	3.81E+00	1.35E+01	<CL
3	002	002	4.34E+01	5.89E+00	431	0.841	7.13E+00	1.40E+01	<CL
4	003	003	3.96E+01	5.63E+00	414	0.841	2.62E+00	1.34E+01	<CL
5	004	004	3.64E+01	5.39E+00	405	0.841	-1.19E+00	1.30E+01	<CL
6	005	005	4.28E+01	5.85E+00	411	0.841	6.42E+00	1.39E+01	<CL
7	006	006	4.02E+01	5.67E+00	413	0.841	3.33E+00	1.35E+01	<CL
8	007	007	4.56E+01	6.04E+00	430	0.841	9.75E+00	1.43E+01	@CL
9	008	008	4.02E+01	5.67E+00	419	0.841	3.33E+00	1.35E+01	<CL
10	009	009	4.02E+01	5.67E+00	428	0.841	3.33E+00	1.35E+01	<CL
11	010	010	4.04E+01	5.68E+00	423	0.841	3.57E+00	1.35E+01	<CL
12	011	011	3.66E+01	5.41E+00	422	0.841	-9.51E-01	1.30E+01	<CL
13	012	012	4.04E+01	5.68E+00	398	0.841	3.57E+00	1.35E+01	<CL

COPY

Internal Lab

Batch No. 900214

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SAR/WR No.

AR/COC 601577

Dept. No./Mail Stop:	6134/1148	[redacted]	Contract No.: ~~AJ-2400~~ N/A
Project/Task Manager:	Caroline Byrd	[redacted]	Case No.: 7213.220600
Project Name:	Foothill Test Area SITE 58	Lab Contact:	~~Edie Kent~~ Fernando
Record Center Code:	ER/1333/58/DAT	Lab Destination:	~~GEL~~ AMIR ON SITE
Logbook Ref. No.:	N/A	SMO Contact/Phone:	Doug Salmi/844-3110
Service Order No.	CFO655	Send Report to SMO:	Suzi Jensen
Location	NA		

												Lab Use
Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
044276-004	S58B-GR-103-15-S	15	58	12799/1055	s	M	500ml	none	G	SA	Gamma Spec	[redacted]
044277-004	S58B-GR-104-20-S	20	58	12799/1130	s	M	500ml	none	G	SA	Gamma Spec	
044103-004	S58FB3-GR-001-0-SS	0	58	12899/900	S	M	500ml	none	G	SA	Gamma Spec	
044104-004	S58FB3-GR-002-0-SS	0	58	12899/910	S	M	500ml	none	G	SA	Gamma Spec	
044105-004	S58FB3-GR-003-0-SS	0	58	12899/915	S	M	500ml	none	G	SA	Gamma Spec	
044106-004	S58FB3-GR-004-0-SS	0	58	12899/920	S	M	500ml	none	G	SA	Gamma Spec	

Reference LOV(available at SMO)

VOA 2/3/99

RMMA	☒ Yes ☐ No Ref. No.	[redacted]	Special Instructions/QC Requirements
Sample Disposal	☒ Return to Client ☐ Disposal by lab		EDD ☐ Yes ☒ No
Turnaround Time	☐ Normal ☒ Rush		Raw Data Package ☐ Yes ☒ No
	Required Report Date		This COC releases COC 601353

	Name	Signature	Init	Company/Organization/Phone
Sample Team Members	Chris Catechis	Ch. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	William J. Gibson	WJG	MDM/6131/235-3841

Please list as separate report.

1. Relinquished by	Ch. Catechis	Org. 6131	Date 1/29/99	Time 1003	4 Relinquished by	Org. 7598	Date 2/1/99 Time 1300
1 Received by	(SMO)	Org. 7577	Date 1/29/99	Time 1003	4. Received by	Org. 6133	Date 2/1/99 Time 1300
2. Relinquished by	(SMO)	Org. 7577	Date 1/29/99	Time 1045	5 Relinquished by	Org.	Date Time
2. Received by		Org. SNL757	Date 1-29-99	Time 1045	5. Received by	Org.	Date Time
3. Relinquished by		Org. SNL757	Date 2-1-99	Time 1044	6 Relinquished by	Org.	Date Time
3. Received by	(SMO)	Org. 7573	Date 2-1-99	Time 1044	6. Received by	Org.	Date Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Site 8/58
Phone: 845-0868
Date Results Needed: RUSH MONDAY
Suspect Isotopes: ? NONE
Other Information: ON SITE 58

Hazards/Special Instructions:
100 MIN COUNT
F3B 01
CASE # 7213, 2206
CoC 601577

Batch Log Number: 900214
Logged By: JM

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044276-004	Soil	12799/1055	500 ml	Gamma Spec	01	<300	781 g	
044277-004	↓	12799/1130	↓	↓	02	↓	820 g	
044103-004		12899/900			03		735 g	
044104-004		12899/910			04		661 g	
044105-004		12899/915			05		795 g	
044106-004		12899/920			06	<300	727 g	
LCS	—	1/30/99	—	γ spec	07	N/A	N/A	

Relinquished by [signature] Date 1-29-99 Time 1045 Received by [signature] Date 1-29-99 Time 1045
Relinquished by [signature] Date 2-1-99 Time 1044 Received by [signature] Date 2-1-99 Time 1044
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/31/99 2:43:08 PM

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044276-004
Lab Sample ID : 90021401

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 781.000 gram
Sample Date/Time : 1/27/99 10:55:00 AM
Acquire Start Date/Time : 1/31/99 1:02:55 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.14E-001
RA-226	7.83E-001	4.85E-001	4.70E-001
PB-214	2.79E-001	9.46E-002	5.84E-002
BI-214	2.77E-001	8.69E-002	4.01E-002
PB-210	Not Detected	---------	6.70E+000
TH-232	5.55E-001	2.89E-001	1.20E-001
RA-228	5.46E-001	2.46E-001	1.26E-001
AC-228	4.47E-001	1.85E-001	7.70E-002
TH-228	Not Detected	---------	5.54E-001
RA-224	5.51E-001	2.97E-001	8.44E-002
PB-212	4.42E-001	1.40E-001	3.65E-002
BI-212	3.54E-001	5.35E-001	2.43E-001
TL-208	4.08E-001	3.11E-001	5.69E-002
U-235	Not Detected	---------	1.62E-001
TH-231	Not Detected	---------	5.91E+000
PA-231	Not Detected	---------	1.07E+000
TH-227	Not Detected	---------	2.39E-001
RA-223	Not Detected	---------	1.23E-001
RN-219	Not Detected	---------	2.99E-001
PB-211	Not Detected	---------	6.76E-001
TL-207	Not Detected	---------	1.24E+001
AM-241	Not Detected	---------	1.59E-001
PU-239	Not Detected	---------	3.01E+002
NP-237	Not Detected	---------	1.56E-001
PA-233	Not Detected	---------	4.68E-002
TH-229	Not Detected	---------	1.40E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021401

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.31E-002
AG-110m	Not Detected	---------	2.67E-002
BA-133	Not Detected	---------	3.61E-002
BE-7	Not Detected	---------	2.06E-001
BI-207	Not Detected	---------	2.53E-002
CD-109	Not Detected	---------	6.50E-001
CD-115	Not Detected	---------	2.02E-001
CE-139	Not Detected	---------	2.02E-002
CE-141	Not Detected	---------	3.96E-002
CE-144	Not Detected	---------	1.58E-001
CO-56	Not Detected	---------	2.93E-002
CO-57	Not Detected	---------	2.06E-002
CO-58	Not Detected	---------	3.02E-002
CO-60	Not Detected	---------	3.76E-002
CR-51	Not Detected	---------	1.97E-001
CS-134	Not Detected	---------	2.76E-002
CS-137	Not Detected	---------	2.80E-002
EU-152	Not Detected	---------	6.13E-002
EU-154	Not Detected	---------	1.58E-001
EU-155	Not Detected	---------	9.22E-002
FE-59	Not Detected	---------	7.13E-002
GD-153	Not Detected	---------	5.28E-002
HG-203	Not Detected	---------	2.60E-002
I-131	Not Detected	---------	3.21E-002
IR-192	Not Detected	---------	2.26E-002
K-40	1.40E+001	2.21E+000	5.91E-001
MN-52	Not Detected	---------	4.56E-002
MN-54	Not Detected	---------	3.00E-002
MO-99	Not Detected	---------	6.01E-001
NA-22	Not Detected	---------	4.28E-002
NA-24	Not Detected	---------	2.85E+000
NB-95	Not Detected	---------	1.93E-001
ND-147	Not Detected	---------	2.09E-001
NI-57	Not Detected	---------	2.86E-001
RU-103	Not Detected	---------	2.48E-002
RU-106	Not Detected	---------	2.49E-001
SB-122	Not Detected	---------	9.06E-002
SB-124	Not Detected	---------	2.52E-002
SB-125	Not Detected	---------	6.44E-002
SN-113	Not Detected	---------	3.01E-002
SR-85	Not Detected	---------	3.22E-002
TA-182	Not Detected	---------	1.39E-001
TA-183	Not Detected	---------	2.37E-001
TC-99m	Not Detected	---------	1.76E+003
TL-201	Not Detected	---------	1.91E-001
XE-133	Not Detected	---------	2.36E-001
Y-88	Not Detected	---------	3.18E-002
ZN-65	Not Detected	---------	8.87E-002
ZR-95	Not Detected	---------	5.24E-002

```
**********************************************************************
*                  Sandia National Laboratories                      *
*    Radiation Protection Sample Diagnostics Program [806 Laboratory]  *
*                      2/01/99  7:22:45 AM                           *
**********************************************************************
*                                                                    *
* Analyzed by:          2/1/99     Reviewed by:       2/1/99        *
**********************************************************************
Customer                : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID      : 044277-004
Lab Sample ID           : 90021402

Sample Description      : MARINELLI SOLID SAMPLE
Sample Quantity         :   820.000  gram
Sample Date/Time        :  1/27/99  11:30:00 AM
Acquire Start Date/Time :  1/31/99   2:44:56 PM
Detector Name           : LAB01
Elapsed Live/Real Time  :   6000 /   6002 seconds

Comments:
**********************************************************************
```

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.14E-001
RA-226	5.57E-001	5.62E-001	4.29E-001
PB-214	3.11E-001	9.77E-002	5.68E-002
BI-214	3.00E-001	1.85E-001	4.38E-002
PB-210	Not Detected	---------	6.07E+000
TH-232	4.86E-001	3.10E-001	1.27E-001
RA-228	5.25E-001	2.65E-001	1.54E-001
AC-228	4.85E-001	1.77E-001	8.06E-002
TH-228	5.05E-001	2.33E-001	3.67E-001
RA-224	5.64E-001	3.12E-001	9.68E-002
PB-212	4.87E-001	1.99E-001	3.52E-002
BI-212	4.93E-001	4.32E-001	2.74E-001
TL-208	4.66E-001	1.44E-001	5.82E-002
U-235	1.19E-001	1.36E-001	1.61E-001
TH-231	Not Detected	---------	5.62E+000
PA-231	Not Detected	---------	1.08E+000
TH-227	Not Detected	---------	2.32E-001
RA-223	Not Detected	---------	1.17E-001
RN-219	Not Detected	---------	3.02E-001
PB-211	Not Detected	---------	6.90E-001
TL-207	Not Detected	---------	1.30E+001
AM-241	Not Detected	---------	1.61E-001
PU-239	Not Detected	---------	2.82E+002
NP-237	Not Detected	---------	1.94E-001
PA-233	Not Detected	---------	4.97E-002
TH-229	Not Detected	---------	1.37E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021402

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.14E-002
AG-110m	Not Detected	---------	2.58E-002
BA-133	Not Detected	---------	3.62E-002
BE-7	Not Detected	---------	2.09E-001
BI-207	Not Detected	---------	2.38E-002
CD-109	Not Detected	---------	6.28E-001
CD-115	Not Detected	---------	1.93E-001
CE-139	Not Detected	---------	2.03E-002
CE-141	Not Detected	---------	3.77E-002
CE-144	Not Detected	---------	1.56E-001
CO-56	Not Detected	---------	3.07E-002
CO-57	Not Detected	---------	1.96E-002
CO-58	Not Detected	---------	2.70E-002
CO-60	Not Detected	---------	3.57E-002
CR-51	Not Detected	---------	2.07E-001
CS-134	Not Detected	---------	2.73E-002
CS-137	Not Detected	---------	2.74E-002
EU-152	Not Detected	---------	5.87E-002
EU-154	Not Detected	---------	1.52E-001
EU-155	Not Detected	---------	9.10E-002
FE-59	Not Detected	---------	7.35E-002
GD-153	Not Detected	---------	5.47E-002
HG-203	Not Detected	---------	2.52E-002
I-131	Not Detected	---------	3.26E-002
IR-192	Not Detected	---------	2.32E-002
K-40	1.60E+001	2.52E+000	5.67E-001
MN-52	Not Detected	---------	4.72E-002
MN-54	Not Detected	---------	3.05E-002
MO-99	Not Detected	---------	5.60E-001
NA-22	Not Detected	---------	4.41E-002
NA-24	Not Detected	---------	3.20E+000
NB-95	Not Detected	---------	1.90E-001
ND-147	Not Detected	---------	1.97E-001
NI-57	Not Detected	---------	3.23E-001
RU-103	Not Detected	---------	2.37E-002
RU-106	Not Detected	---------	2.33E-001
SB-122	Not Detected	---------	9.35E-002
SB-124	Not Detected	---------	2.44E-002
SB-125	Not Detected	---------	6.30E-002
SN-113	Not Detected	---------	2.94E-002
SR-85	Not Detected	---------	3.06E-002
TA-182	Not Detected	---------	1.41E-001
TA-183	Not Detected	---------	2.41E-001
TC-99m	Not Detected	---------	1.94E+003
TL-201	Not Detected	---------	1.88E-001
XE-133	Not Detected	---------	2.42E-001
Y-88	Not Detected	---------	2.94E-002
ZN-65	Not Detected	---------	9.59E-002
ZR-95	Not Detected	---------	4.92E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 7:33:50 AM

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044103-004
Lab Sample ID : 90021403

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 735.000 gram
Sample Date/Time : 1/28/99 9:00:00 AM
Acquire Start Date/Time : 1/31/99 4:26:57 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	5.18E-001
RA-226	1.43E+000	8.57E-001	5.36E-001
PB-214	5.96E-001	1.28E-001	6.51E-002
BI-214	5.60E-001	3.01E-001	4.94E-002
PB-210	Not Detected	---------	8.04E+000
TH-232	8.36E-001	7.30E-001	1.44E-001
RA-228	6.80E-001	3.02E-001	1.79E-001
AC-228	7.10E-001	2.11E-001	9.50E-002
TH-228	9.46E-001	3.47E-001	4.65E-001
RA-224	9.74E-001	4.11E-001	8.27E-002
PB-212	7.80E-001	1.54E-001	4.21E-002
BI-212	6.26E-001	4.00E-001	3.35E-001
TL-208	6.80E-001	1.68E-001	7.01E-002
U-235	9.58E-002	1.67E-001	1.96E-001
TH-231	Not Detected	---------	7.14E+000
PA-231	Not Detected	---------	1.30E+000
TH-227	Not Detected	---------	2.99E-001
RA-223	Not Detected	---------	1.42E-001
RN-219	Not Detected	---------	3.61E-001
PB-211	Not Detected	---------	7.88E-001
TL-207	Not Detected	---------	1.46E+001
AM-241	Not Detected	---------	2.01E-001
PU-239	Not Detected	---------	3.54E+002
NP-237	~~5.45E-001~~	~~2.49E-001~~	2.18E-001 Not detected
PA-233	Not Detected	---------	5.55E-002
TH-229	Not Detected	---------	1.64E-001

2/1/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021403

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.76E-002
AG-110m	Not Detected	---------	4.65E-002
BA-133	Not Detected	---------	4.58E-002
BE-7	Not Detected	---------	2.55E-001
BI-207	Not Detected	---------	3.07E-002
CD-109	Not Detected	---------	8.35E-001
CD-115	Not Detected	---------	1.92E-001
CE-139	Not Detected	---------	2.48E-002
CE-141	Not Detected	---------	4.54E-002
CE-144	Not Detected	---------	1.96E-001
CO-56	Not Detected	---------	3.59E-002
CO-57	Not Detected	---------	2.43E-002
CO-58	Not Detected	---------	3.56E-002
CO-60	Not Detected	---------	3.92E-002
CR-51	Not Detected	---------	2.47E-001
CS-134	Not Detected	---------	3.45E-002
CS-137	1.33E-001	5.46E-002	2.64E-002
EU-152	Not Detected	---------	7.24E-002
EU-154	Not Detected	---------	1.79E-001
EU-155	Not Detected	---------	1.09E-001
FE-59	Not Detected	---------	7.74E-002
GD-153	Not Detected	---------	6.64E-002
HG-203	Not Detected	---------	3.11E-002
I-131	Not Detected	---------	3.70E-002
IR-192	Not Detected	---------	2.77E-002
K-40	1.50E+001	2.44E+000	6.38E-001
MN-52	Not Detected	---------	4.63E-002
MN-54	Not Detected	---------	3.84E-002
MO-99	Not Detected	---------	5.17E-001
NA-22	Not Detected	---------	4.87E-002
NA-24	Not Detected	---------	1.46E+000
NB-95	Not Detected	---------	2.02E-001
ND-147	Not Detected	---------	2.51E-001
NI-57	Not Detected	---------	2.67E-001
RU-103	Not Detected	---------	2.86E-002
RU-106	Not Detected	---------	2.84E-001
SB-122	Not Detected	---------	9.07E-002
SB-124	Not Detected	---------	3.13E-002
SB-125	Not Detected	---------	8.25E-002
SN-113	Not Detected	---------	3.73E-002
SR-85	Not Detected	---------	3.75E-002
TA-182	Not Detected	---------	1.70E-001
TA-183	Not Detected	---------	2.69E-001
TC-99m	Not Detected	---------	2.38E+002
TL-201	Not Detected	---------	1.93E-001
XE-133	Not Detected	---------	2.34E-001
Y-88	Not Detected	---------	3.16E-002
ZN-65	Not Detected	---------	1.09E-001
ZR-95	Not Detected	---------	5.44E-002

```
**********************************************************************
*                  Sandia National Laboratories                      *
*    Radiation Protection Sample Diagnostics Program [806 Laboratory]  *
*                  2/01/99  7:44:43 AM                               *
**********************************************************************
*                                                                    *
* Analyzed by:  2/1/99        Reviewed by:  2/1/99                   *
**********************************************************************
Customer                : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID      : 044104-004
Lab Sample ID           : 90021404

Sample Description      : MARINELLI SOLID SAMPLE
Sample Quantity         :   661.000  gram
Sample Date/Time        :  1/28/99   9:10:00 AM
Acquire Start Date/Time :  1/31/99   6:08:58 PM
Detector Name           : LAB01
Elapsed Live/Real Time  :   6000 /   6002 seconds

Comments:
**********************************************************************
```

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.88E-001	4.09E-001	5.14E-001
RA-226	1.41E+000	1.06E+000	6.16E-001
PB-214	6.13E-001	1.58E-001	7.33E-002
BI-214	5.55E-001	1.51E-001	5.72E-002
PB-210	Not Detected	---	8.95E+000
TH-232	8.50E-001	4.50E-001	1.70E-001
RA-228	7.02E-001	2.99E-001	1.85E-001
AC-228	7.65E-001	1.62E-001	9.66E-002
TH-228	6.50E-001	2.53E-001	5.44E-001
RA-224	9.86E-001	3.81E-001	9.84E-002
PB-212	7.52E-001	1.50E-001	4.58E-002
BI-212	7.89E-001	5.25E-001	3.15E-001
TL-208	7.57E-001	1.96E-001	6.63E-002
U-235	Not Detected	---	2.15E-001
TH-231	Not Detected	---	8.00E+000
PA-231	Not Detected	---	1.51E+000
TH-227	Not Detected	---	3.17E-001
RA-223	Not Detected	---	1.59E-001
RN-219	Not Detected	---	4.20E-001
PB-211	Not Detected	---	9.59E-001
TL-207	Not Detected	---	1.61E+001
AM-241	Not Detected	---	2.14E-001
PU-239	Not Detected	---	3.89E+002
NP-237	Not Detected	---	2.65E-001
PA-233	Not Detected	---	6.30E-002
TH-229	Not Detected	---	1.80E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021404

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.27E-002
AG-110m	Not Detected	---	7.72E-002
BA-133	Not Detected	---	4.94E-002
BE-7	Not Detected	---	2.90E-001
BI-207	Not Detected	---	3.36E-002
CD-109	Not Detected	---	8.84E-001
CD-115	Not Detected	---	2.18E-001
CE-139	Not Detected	---	2.63E-002
CE-141	Not Detected	---	4.87E-002
CE-144	Not Detected	---	2.09E-001
CO-56	Not Detected	---	4.04E-002
CO-57	Not Detected	---	2.68E-002
CO-58	Not Detected	---	3.70E-002
CO-60	Not Detected	---	3.99E-002
CR-51	Not Detected	---	2.88E-001
CS-134	Not Detected	---	3.72E-002
CS-137	5.42E-001	1.58E-001	2.69E-002
EU-152	Not Detected	---	7.94E-002
EU-154	Not Detected	---	2.07E-001
EU-155	Not Detected	---	1.22E-001
FE-59	Not Detected	---	8.69E-002
GD-153	Not Detected	---	7.28E-002
HG-203	Not Detected	---	3.52E-002
I-131	Not Detected	---	4.26E-002
IR-192	Not Detected	---	3.17E-002
K-40	1.60E+001	2.50E+000	7.08E-001
MN-52	Not Detected	---	5.96E-002
MN-54	Not Detected	---	4.23E-002
MO-99	Not Detected	---	6.53E-001
NA-22	Not Detected	---	4.83E-002
NA-24	Not Detected	---	1.51E+000
NB-95	Not Detected	---	2.20E-001
ND-147	Not Detected	---	2.73E-001
NI-57	Not Detected	---	2.76E-001
RU-103	Not Detected	---	3.20E-002
RU-106	Not Detected	---	3.09E-001
SB-122	Not Detected	---	9.95E-002
SB-124	Not Detected	---	3.39E-002
SB-125	Not Detected	---	9.35E-002
SN-113	Not Detected	---	4.11E-002
SR-85	Not Detected	---	4.02E-002
TA-182	Not Detected	---	1.89E-001
TA-183	Not Detected	---	2.90E-001
TC-99m	Not Detected	---	3.18E+002
TL-201	Not Detected	---	2.15E-001
XE-133	Not Detected	---	2.59E-001
Y-88	Not Detected	---	3.40E-002
ZN-65	Not Detected	---	1.23E-001
ZR-95	Not Detected	---	6.09E-002

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 7:57:47 AM
*
****

* Analyzed by: 2/1/99 Reviewed by: 2/1/99 *

****

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044105-004
Lab Sample ID : 90021405

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 795.000 gram
Sample Date/Time : 1/28/99 9:15:00 AM
Acquire Start Date/Time : 1/31/99 7:50:57 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.96E-001
RA-226	1.18E+000	6.51E-001	5.00E-001
PB-214	5.47E-001	3.47E-001	6.02E-002
BI-214	5.04E-001	1.30E-001	4.61E-002
PB-210	Not Detected	---------	7.11E+000
TH-232	7.19E-001	4.01E-001	1.29E-001
RA-228	6.69E-001	2.87E-001	1.58E-001
AC-228	7.09E-001	1.89E-001	7.92E-002
TH-228	8.69E-001	2.86E-001	4.62E-001
RA-224	7.72E-001	2.81E-001	1.13E-001
PB-212	7.50E-001	1.68E-001	3.58E-002
BI-212	6.81E-001	4.67E-001	2.90E-001
TL-208	6.36E-001	1.71E-001	6.39E-002
U-235	1.27E-001	1.57E-001	1.85E-001
TH-231	Not Detected	---------	6.82E+000
PA-231	Not Detected	---------	1.24E+000
TH-227	Not Detected	---------	2.82E-001
RA-223	Not Detected	---------	1.36E-001
RN-219	Not Detected	---------	3.18E-001
PB-211	Not Detected	---------	7.31E-001
TL-207	Not Detected	---------	1.35E+001
AM-241	Not Detected	---------	1.83E-001
PU-239	Not Detected	---------	3.33E+002
NP-237	Not Detected	---------	2.32E-001
PA-233	Not Detected	---------	5.56E-002
TH-229	Not Detected	---------	1.57E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021405

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.75E-002
AG-110m	Not Detected	---------	3.72E-002
BA-133	Not Detected	---------	4.24E-002
BE-7	Not Detected	---------	2.41E-001
BI-207	Not Detected	---------	2.83E-002
CD-109	Not Detected	---------	7.73E-001
CD-115	Not Detected	---------	1.83E-001
CE-139	Not Detected	---------	2.27E-002
CE-141	Not Detected	---------	4.22E-002
CE-144	Not Detected	---------	1.81E-001
CO-56	Not Detected	---------	3.09E-002
CO-57	Not Detected	---------	2.26E-002
CO-58	Not Detected	---------	3.00E-002
CO-60	Not Detected	---------	3.93E-002
CR-51	Not Detected	---------	2.27E-001
CS-134	Not Detected	---------	3.07E-002
CS-137	6.47E-002	3.19E-002	2.16E-002
EU-152	Not Detected	---------	6.77E-002
EU-154	Not Detected	---------	1.80E-001
EU-155	Not Detected	---------	1.06E-001
FE-59	Not Detected	---------	7.85E-002
GD-153	Not Detected	---------	6.33E-002
HG-203	Not Detected	---------	2.90E-002
I-131	Not Detected	---------	3.43E-002
IR-192	Not Detected	---------	2.62E-002
K-40	1.52E+001	2.44E+000	6.05E-001
MN-52	Not Detected	---------	4.70E-002
MN-54	Not Detected	---------	3.51E-002
MO-99	Not Detected	---------	5.53E-001
NA-22	Not Detected	---------	4.43E-002
NA-24	Not Detected	---------	1.68E+000
NB-95	Not Detected	---------	1.91E-001
ND-147	Not Detected	---------	2.28E-001
NI-57	Not Detected	---------	2.56E-001
RU-103	Not Detected	---------	2.64E-002
RU-106	Not Detected	---------	2.75E-001
SB-122	Not Detected	---------	8.66E-002
SB-124	Not Detected	---------	2.63E-002
SB-125	Not Detected	---------	6.88E-002
SN-113	Not Detected	---------	3.52E-002
SR-85	Not Detected	---------	3.58E-002
TA-182	Not Detected	---------	1.60E-001
TA-183	Not Detected	---------	2.49E-001
TC-99m	Not Detected	---------	3.26E+002
TL-201	Not Detected	---------	1.85E-001
XE-133	Not Detected	---------	2.30E-001
Y-88	Not Detected	---------	2.77E-002
ZN-65	Not Detected	---------	1.08E-001
ZR-95	Not Detected	---------	5.45E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 8:08:39 AM

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044106-004
Lab Sample ID : 90021406

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 727.000 gram
Sample Date/Time : 1/28/99 9:20:00 AM
Acquire Start Date/Time : 1/31/99 9:32:58 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.41E-001
RA-226	1.09E+000	7.66E-001	5.31E-001
PB-214	4.77E-001	3.27E-001	6.37E-002
BI-214	4.23E-001	1.18E-001	4.84E-002
PB-210	Not Detected	---	7.66E+000
TH-232	6.98E-001	3.54E-001	1.28E-001
RA-228	5.64E-001	2.58E-001	1.73E-001
AC-228	7.17E-001	1.96E-001	7.43E-002
TH-228	6.12E-001	2.38E-001	4.48E-001
RA-224	8.05E-001	3.45E-001	9.21E-002
PB-212	6.46E-001	3.28E-001	4.02E-002
BI-212	7.22E-001	4.82E-001	2.90E-001
TL-208	6.06E-001	1.72E-001	7.08E-002
U-235	1.31E-001	1.60E-001	1.88E-001
TH-231	Not Detected	---	6.94E+000
PA-231	Not Detected	---	1.24E+000
TH-227	Not Detected	---	2.81E-001
RA-223	Not Detected	---	1.43E-001
RN-219	Not Detected	---	3.51E-001
PB-211	Not Detected	---	7.78E-001
TL-207	Not Detected	---	1.32E+001
AM-241	Not Detected	---	1.80E-001
PU-239	Not Detected	---	3.43E+002
NP-237	~~4.59E-001~~	~~2.00E-001~~	1.98E-001 Not detected
PA-233	Not Detected	---	5.65E-002
TH-229	Not Detected	---	1.61E-001

2/1/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021406

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.69E-002
AG-110m	Not Detected	---	5.42E-002
BA-133	Not Detected	---	4.39E-002
BE-7	Not Detected	---	2.52E-001
BI-207	Not Detected	---	2.92E-002
CD-109	Not Detected	---	7.89E-001
CD-115	Not Detected	---	1.88E-001
CE-139	Not Detected	---	2.34E-002
CE-141	Not Detected	---	4.38E-002
CE-144	Not Detected	---	1.81E-001
CO-56	Not Detected	---	3.58E-002
CO-57	Not Detected	---	2.26E-002
CO-58	Not Detected	---	3.21E-002
CO-60	Not Detected	---	3.87E-002
CR-51	Not Detected	---	2.37E-001
CS-134	Not Detected	---	3.10E-002
CS-137	2.42E-001	6.14E-002	2.24E-002
EU-152	Not Detected	---	6.79E-002
EU-154	Not Detected	---	1.80E-001
EU-155	Not Detected	---	1.12E-001
FE-59	Not Detected	---	8.57E-002
GD-153	Not Detected	---	6.46E-002
HG-203	Not Detected	---	2.96E-002
I-131	Not Detected	---	3.71E-002
IR-192	Not Detected	---	2.65E-002
K-40	1.36E+001	2.11E+000	6.49E-001
MN-52	Not Detected	---	5.10E-002
MN-54	Not Detected	---	3.60E-002
MO-99	Not Detected	---	5.76E-001
NA-22	Not Detected	---	4.23E-002
NA-24	Not Detected	---	1.68E+000
NB-95	Not Detected	---	2.00E-001
ND-147	Not Detected	---	2.42E-001
NI-57	Not Detected	---	2.35E-001
RU-103	Not Detected	---	2.77E-002
RU-106	Not Detected	---	2.72E-001
SB-122	Not Detected	---	9.09E-002
SB-124	Not Detected	---	2.75E-002
SB-125	Not Detected	---	8.00E-002
SN-113	Not Detected	---	3.57E-002
SR-85	Not Detected	---	3.71E-002
TA-182	Not Detected	---	1.50E-001
TA-183	Not Detected	---	2.47E-001
TC-99m	Not Detected	---	3.85E+002
TL-201	Not Detected	---	1.94E-001
XE-133	Not Detected	---	2.29E-001
Y-88	Not Detected	---	3.20E-002
ZN-65	Not Detected	---	1.05E-001
ZR-95	Not Detected	---	5.84E-002

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 6:37:45 AM
*
****

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90021407

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 2/01/99 6:25:17 AM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.71E+003
RA-226	Not Detected	---	5.27E+003
PB-214	Not Detected	---	7.05E+002
BI-214	Not Detected	---	6.45E+002
PB-210	Not Detected	---	6.99E+004
TH-232	Not Detected	---	2.27E+003
RA-228	Not Detected	---	2.95E+003
AC-228	Not Detected	---	1.78E+003
TH-228	Not Detected	---	1.26E+005
RA-224	Not Detected	---	4.49E+003
PB-212	Not Detected	---	9.05E+003
BI-212	Not Detected	---	9.15E+004
TL-208	Not Detected	---	1.96E+004
U-235	Not Detected	---	1.42E+003
TH-231	Not Detected	---	4.38E+004
PA-231	Not Detected	---	1.39E+004
TH-227	Not Detected	---	2.32E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.08E+003
PB-211	Not Detected	---	1.36E+004
TL-207	Not Detected	---	2.55E+005
AM-241	8.27E+004	1.43E+004	1.39E+003
PU-239	Not Detected	---	2.36E+006
NP-237	Not Detected	---	1.33E+003
PA-233	Not Detected	---	6.42E+002
TH-229	Not Detected	---	1.14E+003

[Summary Report] - Sample ID: : 90021407

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.56E+002
AG-110m	Not Detected	---	7.78E+006
BA-133	Not Detected	---	7.71E+002
BE-7	Not Detected	---	3.82E+020
BI-207	Not Detected	---	3.59E+002
CD-109	Not Detected	---	4.11E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	7.27E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.11E+006
CO-56	Not Detected	---	2.48E+014
CO-57	Not Detected	---	3.92E+005
CO-58	Not Detected	---	2.38E+015
CO-60	8.06E+004	1.14E+004	4.52E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.95E+003
CS-137	6.92E+004	9.30E+003	3.13E+002
EU-152	Not Detected	---	8.30E+002
EU-154	Not Detected	---	3.02E+003
EU-155	Not Detected	---	2.61E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	2.57E+006
HG-203	Not Detected	---	8.31E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	5.73E+014
K-40	Not Detected	---	1.42E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	3.32E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.92E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	9.21E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	3.58E+017
SB-125	Not Detected	---	9.15E+003
SN-113	Not Detected	---	3.51E+010
SR-85	Not Detected	---	3.82E+016
TA-182	Not Detected	---	9.63E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	5.87E+010
ZN-65	Not Detected	---	5.06E+006
ZR-95	Not Detected	---	8.83E+016

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 2/01/99 6:37:46 AM
QA File : C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst : FCD
Sample ID : 90021407
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 2/01/99 6:25:17 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 ACTIVITY	8.548E-002	2.535E-003	8.268E-002	<			>
CS-137 Activity	6.837E-002	9.849E-004	6.916E-002	<			>
CO-60 Activity	7.601E-002	2.680E-003	7.800E-002	<			>

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 2/1/99

2001
7527 RAD PRO
01-27-99 WED 13:37 FAX 6113589

Survey Number: S15918

RADIOLOGICAL SURVEY FORM

Location	Requestor/Dept	Date	Time	Duration
ER Site #58B	Mike Young #6134	012799	1130	N/A

Purpose	Request #	RWP #	RPHR #
Release the exterior of soil samples only.	N/A	RWP0309	N/A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP-260/#2883	N/A	John P. Kilbane	John P. Kilbane
Bicron Micro Rem #B973D	N/A	N/A	N/A
N/A	N/A	N/A	N/A

#	Item Description/Location	BETA-GAMMA CONTAMINATION (Counting Data Attached ☒ Yes ☐ No) %Eff. cpm	2σ Bkg cpm	Radionuclide dpm / 100 cm² (1)	DU (2) T/R/F	ALPHA CONTAMINATION (Counting Data Attached ☒ Yes ☐ No) %Eff. cpm	N/A Bkg cpm	Radionuclide dpm / 100 cm² (1)	DU (2) T/R/F	RADIATION SURVEY Bkg. 7 µrem/hr µrem/hr (3)	Distance
1	Sample #'S 044276-001, 044276-002, 044276-003 (1of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
2	Sample #'S 044277-001, 044277-002, 044277-003 (1of2 & 2of2), 044277-004	≤80	80	ND	T				R	≤7	Contact
						N/A					

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW Note (2): Total/Removable/Fixed Note (3): Indicate type, of other than gamma (i.e., η or β).

Remarks

COPY

Reviewed by: Date:

2-4
#515918

****
* Sandia Radioactive Sample Diagnostics Program 1-27-1999 *
****
LSC Analysis Program - version 5.3

Batch Number : 93008104
Count Protocol : 13
Client : ER58B - SAMPLES 1/27/99 JP KILBANE 7523 93008104
Laboratory ID : 6921-2 S/N 405921
Count Date : 27-Jan-99
Protocol Name : H3AB SWIPE
Region of Interest : 0-12
Count Time : 5.0 minutes
Background cpm : 19.80 +- 4.06
Background tSIE : 459.9
Background Eff : 0.412
Systematic Error : 12.90%
Sample Aliquot : 1.000 f

H-3 MDA = 2.38E+01 dpm/f
H-3 CL = 1.13E+01 dpm/f

H-3 Efficiency = 0.9740 - exp(-0.00047*tSIE^1.1600)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: L T Preston 1/27/99 Reviewed by: L T Preston 1/27/99

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity dpm/f	Error	Flag
2	001	001	2.06E+01	4.54E+00	425	0.383	2.09E+00	2.28E+01	<CL
3	002	002	1.96E+01	4.27E+00	430	0.387	-5.17E-01	2.16E+01	<CL

COPY

3-4
#515918

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program          1-27-1999 *
**********************************************************************
LSC Analysis Program - version 5.3

Batch Number         : 93008104
Count Protocol       : 13
Client               : ER58B - SAMPLES 1/27/99 JP KILBANE 7523   93008104
Laboratory ID        : 6921-2  S/N 405921
Count Date           : 27-Jan-99
Protocol Name        : H3AB -- SWIPE
Region of Interest   : 20-600
Count Time           : 5.0 minutes
Background cpm       : 7.40 +- 2.43
Background tSIE      : 459.9
Background Eff       : 1.039
Systematic Error     :  8.90%
Sample Aliquot       : 1.000 f

Alpha MDA =  5.98E+00 dpm/f
Alpha CL  =  2.73E+00 dpm/f

Alpha Efficiency = 1.0390 - exp(-0.00990*tSIE^1.1780)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity dpm/f	Error	Flag
2	001	001	7.00E+00	2.37E+00	425	1.039	-3.85E-01	4.65E+00	<CL
3	002	002	5.80E+00	3.15E+00	430	1.039	-1.54E+00	4.55E+00	<CL

COPY

4 - 4

#s15918

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program          1-27-1999 *
**********************************************************************
LSC Analysis Program - version 5.3

Batch Number        : 93008104
Count Protocol      : 13
Client              : ER58B - SAMPLES 1/27/99 JP KILBANE 7523   93008104
Laboratory ID       : 6921-2  S/N 405921
Count Date          : 27-Jan-99
Protocol Name       : H3AB -- SWIPE
Region of Interest  : 12-2000
Count Time          : 5.0 minutes
Background cpm      : 34.20 +- 5.23
Background tSIE     : 459.9
Background Eff      : 0.841
Systematic Error    :  6.30%
Sample Aliquot      : 1.000 f

Beta MDA =  1.51E+01 dpm/f
Beta CL  =  7.25E+00 dpm/f

Beta Efficiency = 0.8410 - exp(-0.01319*tSIE^1.1040)

Flag Description:

>CL : Result > 2 sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
2	001	001	3.94E+01	5.61E+00	425	0.841	6.18E+00	1.33E+01	<CL
3	002	002	3.94E+01	5.61E+00	430	0.841	6.18E+00	1.33E+01	<CL

COPY

001
7527 RAD PRO
01 20 99 FRI 09:09 FAX 6113559

Survey Number: S16943

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept.	Date	Time	Duration
ER Site #58	Mike Young #6134	012899	1100	N/A

Purpose	Request #	RWP #	RPIR #
Release the exterior of soil samples only and equipment used for sampling.	N/A	RWP0309	N/A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP_260/#2883	N/A	John P. Kilbane	
Bicron Micro Rem #B230L	N/A	N/A	N/A
N/A	N/A	N/A	N/A

#	Item Description/Location	BETA-GAMMA CONTAMINATION (Counting Data Attached ☒ Yes ☐ No) %Eff. 20 / Bkg / Radionuclide / DU (2)	ALPHA CONTAMINATION (Counting Data Attached ☒ Yes ☐ No) %Eff N/A / Bkg / Radionuclide / DU (2)	RADIATION SURVEY Bkg. ?µrem/hr	
		dpm/100 cm² / cpm / dpm/100 cm² / T/RF	dpm/100 cm² / cpm / dpm/100 cm² / T/RF	µrem/hr (3)	Distance
1	Sample #'S=044103-001, 044103-004	≤80 / 80 / ND / T	R	≤7	Contact
2	Sample #'S=044105-001, 044105-004	≤80 / 80 / ND / T	R	≤7	Contact
3	Sample #'S=044106-001, 044106-004	≤80 / 80 / ND / T	R	≤7	Contact
4	Sample #'S=044104-001, 044104-004	≤80 / 80 / ND / T	R	≤7	Contact
5	(2) garden trowels	≤80 / 80 / ND / T	R		
6	Round nose shovel	≤80 / 80 / ND / T	R		
7	Small steel sampling tube	≤80 / 80 / ND / T	R		
8	Small steel sampling tube	≤80 / 80 / ND / T	R		
9	Small steel sampling tube	≤80 / 80 / ND / T	R		
10	Small steel sampling tube	≤80 / 80 / ND / T	R		
11	Small steel sampling tube	≤80 / 80 / ND / T	R		
12	Small steel sampling tube	≤80 / 80 / ND / T	R		
13	Large steel sampling tube	≤80 / 80 / ND / T	R		
14	Large steel sampling tube	≤80 / 80 / ND / T	R		
15	Large steel sampling tube	≤80 / 80 / ND / T	R		

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, if other than gamma (i.e., α or β).

Remarks

Reviewed by: Date:

002
7527 RAD PRO
01 29 98 FRI 09:10 FAX 8113550

Survey #S16043

RADIOLOGICAL SURVEY FORM CONTINUATION

#	Item Description/Location	BETA-GAMMA ACTIVITY				ALPHA ACTIVITY				RADIATION SURVEY	
		cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	µrem/hr (3)	Distance
16	Mixing bowl #1	<80	80	ND	T				R		
17	Mixing bowl #2	<80	80	ND	T				R		

(1) If area other than 100 cm², record as dpm/probe, or cpm/ AW. (2) Total/Removable/Fixed (3) Indicate type, if other than gross (i.e., n, α, β)

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program              1-29-1999 *
**********************************************************************
LSC Analysis Program - version 5.3
```

3-8
#816043

```
Batch Number          : 93008501
Count Protocol        : 1
Client                : ER58 SAMPLE RQMTP. 1/28/99 JPKILBANE 7523 93008501
Laboratory ID         : 6921 - S#411293
Count Date            : 28-Jan-99
Protocol Name         : H3AB -- SWIPE
Region of Interest    : 0-12
Count Time            : 5.0 minutes
Background cpm        : 24.60 +  5.81
Background tSIE       : 463.6
Background Eff        : 0.415
Systematic Error      : 12.90%
Sample Aliquot        : 1.000 f

H-3 MDA =  2.62E+01 dpm/f
H-3 CL  =  1.25E+01 dpm/f

H 3 Efficiency = 0.9740   exp( 0.00047*tSIE^1.1600)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

Analyzed by: RT Preston 1/29/99 Reviewed by: RT Preston 1/29/99

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity dpm/f	Error	Flag
2	001	001	2.22E+01	5.75E+00	456	0.408	-5.88E+00	2.91E+01	<CL
3	002	002	2.22E+01	5.29E+00	443	0.398	-6.03E+00	2.87E+01	<CL
4	003	003	2.40E+01	5.31E+00	444	0.398	-1.52E+00	2.81E+01	<CL
5	004	004	2.22E+01	4.98E+00	453	0.406	-5.91E+00	2.73E+01	<CL
6	005	005	2.82E+01	5.38E+00	433	0.390	9.24E+00	2.99E+01	<CL
7	006	006	1.92E+01	4.53E+00	386	0.349	-1.55E+01	3.26E+01	<CL
8	007	007	1.96E+01	4.19E+00	254	0.225	-2.22E+01	4.73E+01	<CL
9	008	008	1.78E+01	4.25E+00	384	0.347	-1.96E+01	3.15E+01	<CL
10	009	009	2.26E+01	4.58E+00	321	0.290	-6.90E+00	3.67E+01	<CL
11	010	010	1.76E+01	4.00E+00	262	0.233	-3.00E+01	4.59E+01	<CL
12	011	011	1.96E+01	4.27E+00	281	0.251	-1.99E+01	4.27E+01	<CL
13	012	012	2.38E+01	4.47E+00	221	0.192	-4.16E+00	5.40E+01	<CL
14	013	013	2.12E+01	4.49E+00	376	0.340	-1.00E+01	3.26E+01	<CL
15	014	014	2.19E+01	4.47E+00	334	0.302	9.29E+00	3.53E+01	<CL

```
****************************************************************************
* Sandia Radioactive Sample Diagnostics Program                 1-29-1999 *
****************************************************************************
```

Batch Number: 93008501

4-8
#516043

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity dpm/f	Error	Flag
16	015	015	1.72E+01	4.12E+00	359	0.324	-2.28E+01	3.36E+01	<CL
17	016	016	2.12E+01	4.49E+00	369	0.334	-1.02E-01	3.22E+01	<CL
18	017	017	1.76E+01	4.00E+00	384	0.347	2.01E-01	3.08E-01	<CL

****
* Sandia Radioactive Sample Diagnostics Program 1-29-1999 *
****

LSC Analysis Program - version 5.3

5-8
#516043

Batch Number : 93008501
Count Protocol : 1
Client : ER58 SAMPLE EQUIP. 1/28/99 JPKILBANE 7523 93008501
Laboratory ID : 6921 - S#411293
Count Date : 28-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 20-600
Count Time : 5.0 minutes
Background cpm : 3.40 +- 1.65
Background tSIE : 463.6
Background Eff : 1.039
Systematic Error : 8.90%
Sample Aliquot : 1.000 f

Alpha MDA = 4.22E+00 dpm/f
Alpha CL = 1.85E+00 dpm/f

Alpha Efficiency = 1.0390 - exp(-0.00990*tSIE^1.1780)

Flag Description:

>CL : Result > 2 sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity dpm/f	Alpha Activity Error	Flag
2	001	001	3.80E-00	1.74E+00	456	1.039	3.85E-01	3.30E+00	<CL
3	002	002	2.80E-00	1.50E-00	443	1.039	-5.77E-01	3.08E+00	<CL
4	003	003	3.00E+00	1.55E-00	444	1.039	-3.85E-01	3.11E+00	<CL
5	004	004	3.20E-00	1.60E-00	453	1.039	-1.92E 01	3.14E+00	<CL
6	005	005	2.20E-00	1.33E+00	433	1.039	-1.15E+00	2.97E+00	<CL
7	006	006	2.20E+00	1.33E-00	396	1.039	1.15E+00	2.97E+00	<CL
8	007	007	1.20E+00	9.80E-01	254	1.035	-2.12E+00	2.72E+00	<CL
9	008	008	2.60E+00	1.44E+00	304	1.039	-7.70E-01	3.04E+00	<CL
10	009	009	1.80E+00	1.20E+00	321	1.039	-1.54E+00	2.88E+00	<CL
11	010	010	3.20E+00	1.60E+00	262	1.038	-1.93E-01	3.15E+00	<CL
12	011	011	3.40E+00	1.65E+00	281	1.038	0.00E+00	3.18E+00	<CL
13	012	012	1.40E+00	1.06E+00	221	1.036	-1.93E+00	2.79E+00	<CL
14	013	013	2.20E+00	1.33E+00	376	1.039	-1.15E+00	2.97E+00	<CL
15	014	014	3.60E+00	1.70E+00	334	1.039	1.93E-01	3.24E+00	<CL

****
* Sandia Radioactive Sample Diagnostics Program 1-29-1999 *
****

Batch Number: 93008501

6-8
#S 16043

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity dpm/f	Error	Flag
16	015	015	3.00E+00	1.55E+00	359	1.039	-3.85E-01	3.11E+00	<CL
17	016	016	1.80E+00	1.20E+00	369	1.039	-1.54E+00	2.88E+00	<CL
18	017	017	3.00E+00	1.55E+00	384	1.039	-3.85E-01	3.11E+00	<CL

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program            1-29-1999 *
**********************************************************************
```

LSC Analysis Program - version 5.3

1-8
#516043

```
Batch Number          : 93008501
Count Protocol        : 1
Client                : ER58 SAMPLE EQUIP. 1/28/99 JPKILBANE 7523 93008501
Laboratory ID         : 6921 - S#411293
Count Date            : 28-Jan-99
Protocol Name         : H3AB    SWIPE
Region of Interest    : 12-2000
Count Time            : 5.0 minutes
Background cpm        : 49.00 +- 6.26
Background tSIE       : 463.6
Background Eff        : 0.841
Systematic Error      :  6.30%
Sample Aliquot        : 1.000 f

Beta MDA =  1.80E+01 dpm/f
Beta CL  =  8.67E+00 dpm/f

Beta Efficiency = 0.8410 - exp(-0.01319*tSIE^1.1040)
```

Flag Description:

```
>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
?CL : Result < 2-sigma Error  and  Result > Critical Level.
?CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
2	001	001	4.04E+01	5.08E+00	456	0.841	-1.02E+01	1.48E+01	<CL
3	002	002	4.32E+01	5.88E+00	443	0.841	-6.90E+00	1.49E+01	<CL
4	003	003	4.20E+01	5.80E+00	444	0.841	-8.32E+00	1.49E+01	<CL
5	004	004	3.82E+01	5.53E+00	453	0.841	-1.28E+01	1.48E+01	<CL
6	005	005	4.14E+01	5.75E+00	433	0.841	-9.04E+00	1.49E+01	<CL
7	006	006	4.32E+01	5.88E+00	386	0.841	-6.90E+00	1.49E+01	<CL
8	007	007	4.22E+01	5.81E+00	254	0.838	-8.11E+00	1.49E+01	<CL
9	008	008	4.08E+01	5.71E+00	384	0.841	-9.75E+00	1.49E+01	<CL
10	009	009	4.92E+01	6.27E+00	321	0.841	2.38E-01	1.49E+01	<CL
11	010	010	4.68E+01	6.12E+00	262	0.839	-2.62E+00	1.49E+01	<CL
12	011	011	5.22E+01	6.46E+00	281	0.840	3.81E+00	1.54E+01	<CL
13	012	012	4.20E+01	5.80E+00	221	0.835	-8.35E+00	1.50E+01	<CL
14	013	013	4.14E+01	5.75E+00	376	0.841	-9.04E+00	1.49E+01	<CL
15	014	014	4.18E+01	5.78E+00	334	0.841	-8.56E+00	1.49E+01	<CL

****
* Sandia Radioactive Sample Diagnostics Program 1-29-1999 *
****

Batch Number: 93008501

8-8
#516043

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
16	015	015	4.76E-01	6.17E+00	359	0.841	-1.67E+00	1.49E+01	<CL
17	016	016	4.16E+01	5.77E+00	369	0.841	-8.80E+00	1.49E+01	<CL
18	017	017	4.16E-01	5.77E+00	384	0.841	-8.80E+00	1.49E+01	<CL

Feature 58F

SF 2001-COC (6-95)

Internal Lab Batch No. ________

ER Site 58F

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE ___ OF ___

AR/COC- 04923

Dept. No./Mail Stop: 7585/1148
Project/Task Manager: Mike Young/284-2595
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/?
Logbook Ref No: ?/55
Service Order No.: CF0180

Date Samples Shipped: 3-14-96 (SMO USE)
Carrier/Waybill No.: [illegible]
Lab Contact: Edie M. Kent
Lab Destination: GEL
SMO Contact/Phone: Doug Salmi / 848-0963
Send Report to SMO: Deborah McLaughlin

Contract No.: A12480A
Case No.: 8835.110
SMO Authorization: [signature]
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Location Tech Area III
Building ____ Room ____

Reference LOV (available at SMO)

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Metals/[illegible] TAL	Isotopic Uranium	Thorium	Cesium 137	Lab Sample ID
027900-06	58F-GR-004-0.0-SS	0.0	58F	3-12-96 10:32	Soil	AG	250ml	4°C	G	SA	X				
027900-08	58F-GR-004-0.0-SS	"	"	3-12-96 10:32	"	"	"	"	"	"		X	X	X	
027905-06	58F-GR-008-0.0-SS	"	"	3-12-96 11:00	"	"	"	"	"	"	X				
027905-08	58F-GR-008-0.0-SS	"	"	3-12-96 11:00	"	"	"	"	"	"		X	X	X	
027910-06	58F-GR-012-0.0-SS	"	"	3-12-96 11:25	"	"	"	"	"	"	X				
027910-08	58F-GR-012-0.0-SS	"	"	3-12-96 11:25	"	"	"	"	"	"		X	X	X	
027916-06	58F-GR-016-0.0-SS	"	"	3-12-96 1326	"	"	"	"	"	"	X				
027917-06	58F-GR-016-0.0-SS	"	"	3-12-96 1326	"	"	"	"	"	"	X				
027916-08	58F-GR-016-0.0-SS	"	"	3-12-96 1326	"	"	"	"	"	"		X	X	X	
027917-08	58F-GR-016-0.0-SS	"	"	3-12-96 1326	"	"	"	"	"	"		X	X	X	

RMMA ☑ Yes ☐ No Ref. No. ________

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☑ Normal ☐ Rush Required Report Date ________

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ________
Entered by: ________
QC inits. ________

Special Instructions/QC Requirements
- Send Report to Mike Young (1148)
- This coc# 04923 will be released by coc# 04941

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members: Name	Signature	Init	Company/Organization/Phone
Concetta Cacciato	[signature]	CC	Lamb/7583/284-2301
Rod Nagel	[signature]	[illegible]	?/7583
Gilbert Quintana	[signature]		

	Org.	Date	Time
1. Relinquished by [signature]	?/7584	3/14/96	0725
1. Received by [signature]	7583	3/14/96	1125
2. Relinquished by [signature]	7583	3/14/96	1400
2. Received by			
3. Relinquished by			
3. Received by			
4. Relinquished by			
4. Received by			
5. Relinquished by			
5. Received by			
6. Relinquished by			
6. Received by			

WHITE - To Accompany Samples, Laboratory Copy **BLUE** - To Accompany Samples, Return to SMO **YELLOW** - SMO Suspense Copy **PINK** - Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

ER Site 58F

AR/COC- 04923

Project Name: Foothills Test Area Project/Task Manager: Mike Young Case No.: 8335.110

Location Tech Area III

Building _____ Room _____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Parameter & Method Requested										Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Metals (including TAL)	Isotopic Uranium	Iso Thorium	Gamma Spec							
02806 0-16	58F-GR-018-0.0-SEB	0.0	58F	3-12-96 1245	Water	Poly	500ml	HNO_3	G	EB	X										
02806 0-17	58F-GR-018-0.0-SEB	—	58F	3-12-96 1245	Water	Poly	2L	4°	G	EB				X							
02806 0-19	58F-GR-018-0.0-SEB	—	58F	3-12-96 1245	Water	Poly	1L	HNO_3	G	EB		X									
02806 0-20	58F-GR-018-0.0-SEB	—	58F	3-12-96 1245	Water	Poly	1L	HNO_3	G	EB			X								
	(																				
		3-12-96																			

Abnormal Conditions on Receipt

Recipient Initials _____

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027900-08 58F-GR-004-0.0-SSO
Lab ID : 9603295-02
Matrix : SOIL
Date Collected : 03/12/96
Date Received : 03/18/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		0.929	+/- 0.168	.04	0.0767	pCi/g	1.0	TLN	04/08/96	1030	82082	1
Thorium-230	B	0.815	+/- 0.152	.04	0.0426	pCi/g	1.0					
Thorium-232	B	0.979	+/- 0.169	.04	0.0350	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.526	+/- 0.0939	.09	0.0305	pCi/g	1.0	PEM	04/10/96	1728	82081	2
Uranium-235	UB	0.0122	+/- 0.0169	.09	0.0306	pCi/g	1.0					
Uranium-238	B	0.479	+/- 0.0889	.09	0.0268	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228	U	0.986	+/- 0.157	1	0.103	pCi/g	1.0	SCM	04/03/96	0823	82046	1
Americium-241	U	0.0303	+/- 0.0811	2	0.133	pCi/g	1.0					
Cerium-144	U	-0.0141	+/- 0.101	.5	0.175	pCi/g	1.0					
Cesium-134	U	-0.00464	+/- 0.018	.1	0.0314	pCi/g	1.0					
Cesium-137		0.421	+/- 0.0457	.04	0.0344	pCi/g	1.0					
Chromium-51	U	-0.0630	+/- 0.231	1	0.385	pCi/g	1.0					
Cobalt-60	U	-0.00389	+/- 0.0198	.1	0.0357	pCi/g	1.0					
Iron-59	U	-0.0438	+/- 0.0578	1	0.0933	pCi/g	1.0					
Lead-212	U	0.960	+/- 0.0648	1	0.0544	pCi/g	1.0					
Lead-214	U	0.863	+/- 0.0989	1	0.0604	pCi/g	1.0					
Potassium-40		18.7	+/- 1.03	1	0.336	pCi/g	1.0					
Radium-226	U	0.788	+/- 0.0988	1	0.0662	pCi/g	1.0					
Radium-228	U	0.986	+/- 0.157	1	0.103	pCi/g	1.0					
Ruthenium-103	U	0.0141	+/- 0.0237	1	0.0441	pCi/g	1.0					
Ruthenium-106	U	0.00680	+/- 0.177	.8	0.315	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.178	pCi/g	1.0					
Thorium-232	U	0.939	+/- 0.0634	2	0.0532	pCi/g	1.0					
Thorium-234	UB	1.76	+/- 1.05	5	1.09	pCi/g	1.0					
Uranium-235	U	0.137	+/- 0.104	1	0.188	pCi/g	1.0					

38

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027900-08 58F-GR-004-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst Date	Time	Batch	M
Uranium-238	UB	1.76	+/- 1.05	5	1.09	pCi/g	1.0				
Zirconium-95	U	0.0362	+/- 0.0422	1	0.0788	pCi/g	1.0	SCM 04/03/96	0823	82046	1

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111

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CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027900-08 58F-GR-004-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

40

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GENERAL ENGINEERING LABORATORIES

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027905-08 58F-GR-008-0.0-SSO
Lab ID : 9603295-04
Matrix : SOIL
Date Collected : 03/12/96
Date Received : 03/18/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.22	+/- 0.211	.04	0.111	pCi/g	1.0	TLN	04/08/96	1030	82082	1
Thorium-230	B	0.948	+/- 0.175	.04	0.0542	pCi/g	1.0					
Thorium-232	B	0.914	+/- 0.171	.04	0.0597	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.584	+/- 0.106	.09	0.0257	pCi/g	1.0	PEM	04/10/96	1728	82081	2
Uranium-235	UB	0.0673	+/- 0.0357	.09	0.0356	pCi/g	1.0					
Uranium-238	B	0.513	+/- 0.0984	.09	0.0122	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228	U	0.780	+/- 0.169	1	0.111	pCi/g	1.0	SCM	04/03/96	0825	82046	1
Americium-241	U	-0.0213	+/- 0.101	2	0.120	pCi/g	1.0					
Cerium-144	U	-0.0913	+/- 0.107	.5	0.171	pCi/g	1.0					
Cesium-134	U	0.00159	+/- 0.0177	.1	0.0264	pCi/g	1.0					
Cesium-137		0.0834	+/- 0.027	.04	0.0348	pCi/g	1.0					
Chromium-51	U	0.0456	+/- 0.204	1	0.357	pCi/g	1.0					
Cobalt-60	U	-0.0147	+/- 0.0181	.1	0.0291	pCi/g	1.0					
Iron-59	U	0.00589	+/- 0.0609	1	0.0929	pCi/g	1.0					
Lead-212	U	0.964	+/- 0.0689	1	0.0442	pCi/g	1.0					
Lead-214	U	0.739	+/- 0.0686	1	0.0531	pCi/g	1.0					
Potassium-40		22.6	+/- 1.01	1	0.307	pCi/g	1.0					
Radium-226	U	0.541	+/- 0.0862	1	0.0529	pCi/g	1.0					
Radium-228	U	0.780	+/- 0.169	1	0.111	pCi/g	1.0					
Ruthenium-103	U	0.00565	+/- 0.0223	1	0.0387	pCi/g	1.0					
Ruthenium-106	U	0.0485	+/- 0.148	.8	0.257	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.165	pCi/g	1.0					
Thorium-232	U	0.943	+/- 0.0674	2	0.0432	pCi/g	1.0					
Thorium-234	UB	1.03	+/- 1.44	5	1.03	pCi/g	1.0					
Uranium-235	U	0.0904	+/- 0.11	1	0.185	pCi/g	1.0					

41

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027905-08 58F-GR-008-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	1.03	+/- 1.44	5	1.03	pCi/g	1.0					
Zirconium-95	U	0.0112	+/- 0.0351	1	0.0637	pCi/g	1.0	SCM	04/03/96	0825	82046	1

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111

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Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027905-08 58F-GR-008-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID	: 027910-08 58F-GR-012-0.0-SSO
Lab ID	: 9603295-06
Matrix	: SOIL
Date Collected	: 03/12/96
Date Received	: 03/18/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.27	+/- 0.221	.04	0.0659	pCi/g	1.0	TLN	04/08/96	1030	82082	1
Thorium-230	B	0.758	+/- 0.159	.04	0.0421	pCi/g	1.0					
Thorium-232	B	1.09	+/- 0.199	.04	0.0582	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.567	+/- 0.0984	.09	0.0223	pCi/g	1.0	PEM	04/10/96	1728	82081	2
Uranium-235	UB	0.0496	+/- 0.0268	.09	0.0106	pCi/g	1.0					
Uranium-238	B	0.583	+/- 0.0998	.09	0.0106	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228		1.03	+/- 0.289	1	0.119	pCi/g	1.0	SCM	04/03/96	0827	82046	1
Americium-241	U	-0.0132	+/- 0.0784	2	0.124	pCi/g	1.0					
Cerium-144	U	-0.00116	+/- 0.101	.5	0.173	pCi/g	1.0					
Cesium-134	U	0.00359	+/- 0.0184	.1	0.0286	pCi/g	1.0					
Cesium-137		0.0534	+/- 0.0433	.04	0.0323	pCi/g	1.0					
Chromium-51	U	-0.0438	+/- 0.226	1	0.372	pCi/g	1.0					
Cobalt-60	U	0.0000900	+/- 0.0193	.1	0.0349	pCi/g	1.0					
Iron-59	U	0.00774	+/- 0.0568	1	0.0902	pCi/g	1.0					
Lead-212		1.02	+/- 0.157	1	0.0488	pCi/g	1.0					
Lead-214	U	0.658	+/- 0.14	1	0.0553	pCi/g	1.0					
Potassium-40		21.3	+/- 2.84	1	0.385	pCi/g	1.0					
Radium-226	U	0.607	+/- 0.117	1	0.0551	pCi/g	1.0					
Radium-228		1.03	+/- 0.289	1	0.119	pCi/g	1.0					
Ruthenium-103	U	-0.00417	+/- 0.022	1	0.0383	pCi/g	1.0					
Ruthenium-106	U	0.0632	+/- 0.151	.8	0.271	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.181	pCi/g	1.0					
Thorium-232	U	1.00	+/- 0.153	2	0.0477	pCi/g	1.0					
Thorium-234	UB	1.15	+/- 1.26	5	1.02	pCi/g	1.0					
Uranium-235	U	0.0772	+/- 0.102	1	0.177	pCi/g	1.0					

44

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cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027910-08 58F-GR-012-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	1.15	+/- 1.26	5	1.02	pCi/g	1.0					
Zirconium-95	U	0.00395	+/- 0.0406	1	0.0704	pCi/g	1.0	SCM	04/03/96	0827	82046	1

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027910-08 58F-GR-012-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027916-08 58F-GR-016-0.0-SSO
Lab ID : 9603295-09
Matrix : SOIL
Date Collected : 03/12/96
Date Received : 03/18/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.28	+/- 0.218	.04	0.0690	pCi/g	1.0	TLN	04/08/96	1030	82082	1
Thorium-230	B	0.797	+/- 0.16	.04	0.0407	pCi/g	1.0					
Thorium-232	B	0.885	+/- 0.171	.04	0.0495	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.544	+/- 0.0988	.09	0.0290	pCi/g	1.0	PEM	04/10/96	1728	82081	2
Uranium-235	UB	0.0398	+/- 0.0256	.09	0.0239	pCi/g	1.0					
Uranium-238	B	0.533	+/- 0.0971	.09	0.0113	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228	U	0.921	+/- 0.156	1	0.114	pCi/g	1.0	SCM	04/03/96	1950	82046	1
Americium-241	U	0.0765	+/- 0.0694	2	0.116	pCi/g	1.0					
Cerium-144	U	-0.0200	+/- 0.0887	.5	0.153	pCi/g	1.0					
Cesium-134	U	0.000740	+/- 0.0165	.1	0.0260	pCi/g	1.0					
Cesium-137		0.114	+/- 0.0305	.04	0.0297	pCi/g	1.0					
Chromium-51	U	-0.0993	+/- 0.195	1	0.321	pCi/g	1.0					
Cobalt-60	U	0.00767	+/- 0.0188	.1	0.0353	pCi/g	1.0					
Iron-59	U	-0.00434	+/- 0.0803	1	0.0856	pCi/g	1.0					
Lead-212	U	0.981	+/- 0.0598	1	0.0405	pCi/g	1.0					
Lead-214	U	0.816	+/- 0.0966	1	0.0519	pCi/g	1.0					
Potassium-40		19.5	+/- 0.924	1	0.221	pCi/g	1.0					
Radium-226	U	0.742	+/- 0.0926	1	0.0525	pCi/g	1.0					
Radium-228	U	0.921	+/- 0.156	1	0.114	pCi/g	1.0					
Ruthenium-103	U	-0.00478	+/- 0.0207	1	0.0367	pCi/g	1.0					
Ruthenium-106	U	-0.0339	+/- 0.147	.8	0.257	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.150	pCi/g	1.0					
Thorium-232	U	0.960	+/- 0.0585	2	0.0396	pCi/g	1.0					
Thorium-234	UB	0.577	+/- 0.79	5	0.931	pCi/g	1.0					
Uranium-235	U	0.0355	+/- 0.0924	1	0.162	pCi/g	1.0					

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027916-08 58F-GR-016-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.577	+/- 0.79	5	0.931	pCi/g	1.0					
Zirconium-95	U	0.0166	+/- 0.0333	1	0.0612	pCi/g	1.0	SCM	04/03/96	1950	82046	1

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111

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Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027916-08 58F-GR-016-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027917-08 58F-GR-016-0.0-SSO
Lab ID : 9603295-10
Matrix : SOIL
Date Collected : 03/12/96
Date Received : 03/18/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.06	+/- 0.195	.04	0.115	pCi/g	1.0	TLN	04/08/96	1030	82082	1
Thorium-230	B	0.918	+/- 0.17	.04	0.0185	pCi/g	1.0					
Thorium-232	B	0.872	+/- 0.165	.04	0.0388	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.596	+/- 0.0977	.09	0.0254	pCi/g	1.0	PEM	04/10/96	1728	82081	2
Uranium-235	UB	0.0348	+/- 0.0238	.09	0.0290	pCi/g	1.0					
Uranium-238	B	0.548	+/- 0.0929	.09	0.0209	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228	U	0.854	+/- 0.196	1	0.0779	pCi/g	1.0	SCM	04/03/96	0831	82046	1
Americium-241	U	0.0192	+/- 0.046	2	0.0813	pCi/g	1.0					
Cerium-144	U	-0.0100	+/- 0.0771	.5	0.131	pCi/g	1.0					
Cesium-134	U	-0.0262	+/- 0.0127	.1	0.0191	pCi/g	1.0					
Cesium-137		0.0917	+/- 0.0274	.04	0.0212	pCi/g	1.0					
Chromium-51	U	0.150	+/- 0.189	1	0.232	pCi/g	1.0					
Cobalt-60	U	0.00456	+/- 0.0127	.1	0.0231	pCi/g	1.0					
Iron-59	U	-0.0180	+/- 0.0341	1	0.0580	pCi/g	1.0					
Lead-212	U	0.960	+/- 0.133	1	0.0325	pCi/g	1.0					
Lead-214	U	0.760	+/- 0.123	1	0.0388	pCi/g	1.0					
Potassium-40		22.0	+/- 2.95	1	0.170	pCi/g	1.0					
Radium-226	U	0.560	+/- 0.0883	1	0.0411	pCi/g	1.0					
Radium-228	U	0.854	+/- 0.196	1	0.0779	pCi/g	1.0					
Ruthenium-103	U	-0.00296	+/- 0.014	1	0.0241	pCi/g	1.0					
Ruthenium-106	U	0.0457	+/- 0.101	.8	0.178	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.107	pCi/g	1.0					
Thorium-232	U	0.939	+/- 0.13	2	0.0318	pCi/g	1.0					
Thorium-234	UB	0.905	+/- 0.783	5	0.664	pCi/g	1.0					
Uranium-235	U	0.00	+/- 0	1	0.148	pCi/g	1.0					

50

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027917-08 58F-GR-016-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.905	+/- 0.783	5	0.664	pCi/g	1.0					
Zirconium-95	U	0.0422	+/- 0.0252	1	0.0459	pCi/g	1.0	SCM	04/03/96	0831	82046	1

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111

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Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027917-08 58F-GR-016-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: March 29, 1996

Sample ID	: 028060-17 58F-GR-018-0.0-EB
Lab ID	: 9603295-12
Matrix	: AQUEOUS
Date Collected	: 03/12/96
Date Received	: 03/18/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Gamma PHA - 21 items												
Actinium-228	U	0.0385	+/- 16.1	30	21.0	pCi/L	1.0	SCM	03/19/96	2119	82040	1
Americium-241	U	-11.3	+/- 15.3	100	25.2	pCi/L	1.0					
Cerium-144	U	8.06	+/- 20.4	60	34.8	pCi/L	1.0					
Cesium-134	U	-1.04	+/- 2.91	10	4.87	pCi/L	1.0					
Cesium-137	U	3.61	+/- 3.28	35	6.28	pCi/L	1.0					
Chromium-51	U	-27.0	+/- 28	30	39.4	pCi/L	1.0					
Cobalt-60	U	-1.62	+/- 3.39	10	5.72	pCi/L	1.0					
Iron-59	U	0.128	+/- 6.05	10	11.0	pCi/L	1.0					
Lead-212	U	1.76	+/- 8.77	15	7.53	pCi/L	1.0					
Lead-214	U	4.43	+/- 6.05	10	11.1	pCi/L	1.0					
Potassium-40	U	10.6	+/- 49	110	46.7	pCi/L	1.0					
Radium-226	U	0.906	+/- 6.24	6.34	10.9	pCi/L	1.0					
Radium-228	U	0.0385	+/- 16.1	15	21.0	pCi/L	1.0					
Ruthenium-103	U	-3.37	+/- 2.86	10	4.45	pCi/L	1.0					
Ruthenium-106	U	4.24	+/- 25.6	90	45.5	pCi/L	1.0					
Thorium-231	U	-0.886	+/- 14.7	15	25.9	pCi/L	1.0					
Thorium-232	U	1.75	+/- 8.71	15	7.47	pCi/L	1.0					
Thorium-234	U	0.00	+/- 0	350	256	pCi/L	1.0					
Uranium-235	U	8.16	+/- 23.4	21.5	35.5	pCi/L	1.0					
Uranium-238	U	0.00	+/- 0	500	256	pCi/L	1.0					
Zirconium-95	U	-4.16	+/- 4.4	10	7.28	pCi/L	1.0					

M = Method	Method-Description
M 1	EPI A-013

53

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: March 29, 1996

Sample ID : 028060-17 58F-GR-018-0.0-EB

M = Method	Method-Description

GEL Laboratory Certifications

AL - 41040
AZ - AZ0514
CA - 2089
CT - PH-0169
DE - SC012
FL - E87156/87294
ME - SC012
MS - 10120
NC - 233
NY - 11501
RI - 135
SC - 10120
TN - 02934
UT - E-251
VA - 00151
WA - C223
WI - 999887790

EPI Laboratory Certifications

AL - 41050
AZ - AZ0514
CA - I-1023/2056
CT - PH-0175
FL - E87472/87458
MS - 29417
NY - 11502
RI - 138
SC - 10582
TN - 02934
UT - E-227
VA - 00111
WA - C225
NJ - 79002
PA - 68-485

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: March 29, 1996

Sample ID : 028060-17 58F-GR-018-0.0-EB

GEL Laboratory Certifications **EPI Laboratory Certifications**

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 08, 1996

Sample ID	: 028060-19 58F-GR-018-0.0-EB
Lab ID	: 9603295-13
Matrix	: AQUEOUS
Date Collected	: 03/12/96
Date Received	: 03/18/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst Date	Time	Batch	M
Radiological											
Alpha Spectroscopy Uranium - 3 items											
Uranium-233/234	B	0.689	+/- 0.141	.15	0.0197	pCi/l	1.0	ADW 04/02/96	1501	82048	1
Uranium-235	B	0.668	+/- 0.14	.15	0.0415	pCi/l	1.0				
Uranium-238	B	0.416	+/- 0.108	.15	0.0413	pCi/l	1.0				

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	EPI A-011

GEL Laboratory Certifications **EPI Laboratory Certifications**

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 08, 1996

Sample ID : 028060-19 58F-GR-018-0.0-EB

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 02, 1996

Sample ID	: 028060-20 58F-GR-018-0.0-EB
Lab ID	: 9603295-14
Matrix	: AQUEOUS
Date Collected	: 03/12/96
Date Received	: 03/18/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228	U	0.0322	+/- 0.0515	.15	0.100	pCi/l	1.0	TLN	03/26/96	0955	82047	1
Thorium-230	UB	0.144	+/- 0.0715	.15	0.0614	pCi/l	1.0					
Thorium-232	U	0.0280	+/- 0.0331	.15	0.0505	pCi/l	1.0					

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	EPI A-012

GEL Laboratory Certifications **EPI Laboratory Certifications**

58

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GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 02, 1996

Sample ID : 028060-20 58F-GR-018-0.0-EB

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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58F

SF 2001-COC (6-95)

Internal Lab Batch No. 600193

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AMIR-IN-HOUSE "RUSH"

AR/COC- 04941

Dept. No./Mail Stop: 7585(1148)
Project/Task Manager: Mike Young (7585)
Project Name: Foothills Test Area
Record Center Code: ER/1332/58F/TFT
Logbook Ref No: 0155
Service Order No.: CF0180

Date Samples Shipped: 3/13/96
Carrier/Waybill No.: HC
Lab Contact: AMIR MOHAGHEGHI
Lab Destination: AMIR
SMO Contact/Phone: Doug Salmi (848-0963)
Send Report to SMO D McLaughlin

Contract No.: 8235 110
Case No.: ~~AT-2480A~~
SMO Authorization: ____
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec

Location Tech Area TA III
Building ____ Room ____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
027899-02	58F-GR-004-0.0-SS	0.0	58F	3-12-96 10:32	Soil	Poly	500ml	4°	G	SA	X	
027904-02	58F-GR-008-0.0-SS	"	58F	3-12-96 11:00	"	"	"	"	"	"	X	
027909-02	58F-GR-012-0.0-SS	"	58F	3-12-96 11:25	"	"	"	"	"	"	X	
027914-02	58F-GR-016-0.0-SS	"	58F	3-12-96 1326	"	"	"	"	"	"	X	

RMMA ☑ Yes ☐ No Ref. No. ____

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☑ Rush Required Report Date ____

Sample Tracking
Date Entered (mm/dd/yy) 3/19/96
Entered by: Aime
QC Inits. ____

Special Instructions/QC Requirements
- Please send report to Mike Young (1148), ED RANKIN (SMO)
- Need 24 hour TURN-A-ROUND
- This COC 04941 will release COC# 04923 to GEL

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciato	Concetta Cacciato	CC	Lamb/7584/284-3301
	Rod Nagel	Rod Nagel	RN	IT/7584
	Gilbert Quintana	Gilbert Quintana		

1. Relinquished by	Rod Nagel	Org. IT/7584	Date 3/13/96	Time 0850	4. Relinquished by	Org.	Date Time
1. Received by		Org. SNL7713	Date 3/13/96	Time 0850	4. Received by	Org.	Date Time
2. Relinquished by	[illegible]	Org. SNL7713	Date 3/13/96	Time 1045	5. Relinquished by	Org.	Date Time
2. Received by	[illegible]	Org. SMO 853	Date 3/13/96	Time 1045	5. Received by	Org.	Date Time
3. Relinquished by		Org.	Date 3/14/96	Time	6. Relinquished by	Org.	Date Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date Time

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy

Kevin Roberts 04941 to GEL

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-13-96 12:40:59 PM

*Dept 7714 Survey No. _____
*Use Only Surveyed by: _____

Reviewed by: 3/14/96

Customer : MIKE YOUNG (7585/1148)
Customer Sample ID : 027899-02
Lab Sample ID : 60019301

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 697.000 gram
Sample Date/Time : 3-12-96 10:32:00 AM
Acquire Start Date : 3-13-96 10:52:56 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.27
TH-234	1.21	3.95E-01	5.57E-01
RA-226	1.33	5.39E-01	7.75E-01
PB-214	6.02E-01	1.02E-01	7.00E-02
BI-214	5.62E-01	9.51E-02	5.72E-02
TH-232	7.12E-01	3.38E-01	1.72E-01
RA-228	8.60E-01	2.28E-01	1.52E-01
AC-228	8.27E-01	1.58E-01	1.06E-01
TH-228	1.07	3.28E-01	5.02E-01
RA-224	7.91E-01	2.05E-01	9.32E-02
PB-212	8.35E-01	1.40E-01	3.83E-02
BI-212	9.93E-01	4.17E-01	5.96E-01
TL-208	7.52E-01	1.26E-01	8.32E-02
U-235	Not Detected	--------	2.29E-01
TH-231	Not Detected	--------	2.65
PA-231	Not Detected	--------	1.43
TH-227	Not Detected	--------	3.70E-01
RA-223	Not Detected	--------	1.85E-01
RN-219	Not Detected	--------	3.94E-01
PB-211	Not Detected	--------	9.34E-01
TL-207	Not Detected	--------	1.32E+01
AM-241	Not Detected	--------	5.39E-01
PU-239	Not Detected	--------	4.41E+02
NP-237	Not Detected	--------	2.66E-01
PA-233	Not Detected	--------	5.88E-02
TH-229	Not Detected	--------	2.85E-01

[Summary Report] - Sample ID: 60019301

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	5.20E-02
AR-41	Not Detected	--------	5.23E+02
BA-133	Not Detected	--------	6.01E-02
BA-140	Not Detected	--------	1.07E-01
CD-109	Not Detected	--------	9.14E-01
CD-115	Not Detected	--------	8.77E-02
CE-139	~~1.04E-02~~	~~1.30E-02~~	2.09E-02 not detected 3/14/96
CE-141	Not Detected	--------	5.23E-02
CE-144	Not Detected	--------	2.34E-01
CO-56	Not Detected	--------	3.51E-02
CO-57	Not Detected	--------	3.11E-02
CO-58	Not Detected	--------	2.98E-02
CO-60	Not Detected	--------	3.79E-02
CR-51	Not Detected	--------	2.33E-01
CS-134	Not Detected	--------	4.88E-02
CS-137	2.85E-01	4.64E-02	3.01E-02
CU-64	Not Detected	--------	2.91E+01
EU-152	Not Detected	--------	8.60E-02
EU-154	Not Detected	--------	1.76E-01
EU-155	Not Detected	--------	1.37E-01
FE-59	Not Detected	--------	6.78E-02
GD-153	Not Detected	--------	1.11E-01
HG-203	Not Detected	--------	2.90E-02
I-131	Not Detected	--------	3.08E-02
IN-115m	Not Detected	--------	3.12
IR-192	Not Detected	--------	2.80E-02
K-40	1.67E+01	2.28	3.14E-01
LA-140	Not Detected	--------	5.42E-02
MN-52	Not Detected	--------	3.32E-02
MN-54	Not Detected	--------	3.26E-02
MN-56	Not Detected	--------	3.03E+01
MO-99	Not Detected	--------	3.10E-01
NA-22	Not Detected	--------	3.94E-02
NA-24	Not Detected	--------	1.04E-01
NB-95	Not Detected	--------	2.09E-01
ND-147	Not Detected	--------	2.03E-01
NI-57	Not Detected	--------	7.38E-02
BE-07	Not Detected	--------	2.47E-01
RU-103	Not Detected	--------	2.75E-02
RU-106	Not Detected	--------	2.72E-01
SB-122	Not Detected	--------	5.21E-02
SB-124	Not Detected	--------	3.13E-02
SB-125	Not Detected	--------	8.32E-02
SC-46	Not Detected	--------	5.12E-02
SR-85	Not Detected	--------	3.73E-02
TA-182	Not Detected	--------	1.49E-01
TA-183	Not Detected	--------	5.31E-01
TE-132	Not Detected	--------	3.39E-02
TL-201	Not Detected	--------	2.01E-01
XE-133	Not Detected	--------	1.65E-01
Y-88	Not Detected	--------	2.72E-02
ZN-65	Not Detected	--------	1.00E-01
ZR-95	Not Detected	--------	5.55E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-13-96 3:09:39 PM *
****
* *Dept 7714 Survey No._____ *
* Reviewed by: 3/14/96 *Use Only Surveyed by:_____ *
****

Customer : MIKE YOUNG (7585/1148)
Customer Sample ID : 027904-02
Lab Sample ID : 60019302

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 927.000 gram
Sample Date/Time : 3-12-96 11:00:00 AM
Acquire Start Date : 3-13-96 1:26:54 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.01
TH-234	6.96E-01	2.17E-01	2.91E-01
RA-226	1.02	4.82E-01	7.00E-01
PB-214	5.70E-01	1.26E-01	7.55E-02
BI-214	4.85E-01	9.37E-02	7.14E-02
TH-232	7.50E-01	3.64E-01	1.47E-01
RA-228	6.58E-01	1.70E-01	1.34E-01
AC-228	7.51E-01	1.47E-01	9.93E-02
TH-228	Not Detected	--------	5.66E-01
RA-224	7.64E-01	2.11E-01	9.28E-02
PB-212	7.26E-01	1.58E-01	3.12E-02
BI-212	6.32E-01	3.03E-01	4.37E-01
TL-208	6.67E-01	1.21E-01	7.26E-02
U-235	~~8.84E-02~~	~~1.06E-01~~	1.49E-01 Not detected 3/14/96
TH-231	Not Detected	--------	1.26
PA-231	Not Detected	--------	1.10
TH-227	Not Detected	--------	2.99E-01
RA-223	Not Detected	--------	9.40E-02
RN-219	Not Detected	--------	3.29E-01
PB-211	Not Detected	--------	7.55E-01
TL-207	Not Detected	--------	1.23E+01
AM-241	Not Detected	--------	1.24E-01
PU-239	Not Detected	--------	2.67E+02
NP-237	Not Detected	--------	1.89E-01
PA-233	Not Detected	--------	4.74E-02
TH-229	Not Detected	--------	1.47E-01

[Summary Report] - Sample ID: 60019302

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.44E-02
AR-41	Not Detected	--------	1.25E+03
BA-133	Not Detected	--------	4.97E-02
BA-140	Not Detected	--------	1.01E-01
CD-109	Not Detected	--------	4.98E-01
CD-115	Not Detected	--------	7.99E-02
CE-139	Not Detected	--------	2.06E-02
CE-141	Not Detected	--------	3.47E-02
CE-144	Not Detected	--------	1.43E-01
CO-56	Not Detected	--------	3.02E-02
CO-57	Not Detected	--------	1.81E-02
CO-58	Not Detected	--------	2.87E-02
CO-60	Not Detected	--------	3.30E-02
CR-51	Not Detected	--------	1.90E-01
CS-134	Not Detected	--------	4.27E-02
CS-137	6.05E-02	2.11E-02	2.76E-02
CU-64	Not Detected	--------	3.01E+01
EU-152	Not Detected	--------	7.37E-02
EU-154	Not Detected	--------	1.52E-01
EU-155	Not Detected	--------	7.59E-02
FE-59	Not Detected	--------	6.65E-02
GD-153	Not Detected	--------	5.67E-02
HG-203	Not Detected	--------	2.35E-02
I-131	Not Detected	--------	2.62E-02
IN-115m	Not Detected	--------	3.83
IR-192	Not Detected	--------	2.21E-02
K-40	1.59E+01	2.20	2.69E-01
LA-140	Not Detected	--------	5.53E-02
MN-52	Not Detected	--------	3.38E-02
MN-54	Not Detected	--------	3.22E-02
MN-56	Not Detected	--------	4.59E+01
MO-99	Not Detected	--------	3.04E-01
NA-22	Not Detected	--------	4.03E-02
NA-24	Not Detected	--------	1.01E-01
NB-95	Not Detected	--------	1.72E-01
ND-147	Not Detected	--------	1.85E-01
NI-57	Not Detected	--------	7.08E-02
BE-07	Not Detected	--------	2.12E-01
RU-103	Not Detected	--------	2.46E-02
RU-106	Not Detected	--------	2.66E-01
SB-122	Not Detected	--------	4.71E-02
SB-124	Not Detected	--------	2.78E-02
SB-125	Not Detected	--------	7.27E-02
SC-46	Not Detected	--------	4.85E-02
SR-85	Not Detected	--------	3.35E-02
TA-182	Not Detected	--------	1.42E-01
TA-183	Not Detected	--------	1.22E-01
TE-132	Not Detected	--------	2.65E-02
TL-201	Not Detected	--------	7.85E-02
XE-133	Not Detected	--------	8.05E-02
Y-88	Not Detected	--------	2.56E-02
ZN-65	Not Detected	--------	9.41E-02
ZR-95	Not Detected	--------	5.08E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

3-13-96 3:14:22 PM

*Dept 7714 Survey No. _____

Reviewed by: 3/14/96 *Use Only Surveyed by: _____

Customer : MIKE YOUNG (7585/1148)
Customer Sample ID : 027909-02
Lab Sample ID : 60019303

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 804.000 gram
Sample Date/Time : 3-12-96 11:25:00 AM
Acquire Start Date : 3-13-96 1:31:15 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.02
TH-234	1.05	3.74E-01	5.26E-01
RA-226	1.02	3.37E-01	4.48E-01
PB-214	5.29E-01	9.32E-02	3.98E-02
BI-214	5.41E-01	9.15E-02	5.77E-02
TH-232	7.85E-01	3.71E-01	1.89E-01
RA-228	8.39E-01	2.79E-01	1.39E-01
AC-228	8.60E-01	1.36E-01	7.43E-02
TH-228	6.89E-01	2.14E-01	4.11E-01
RA-224	8.24E-01	2.07E-01	7.66E-02
PB-212	7.69E-01	1.37E-01	3.40E-02
BI-212	8.97E-01	2.47E-01	2.81E-01
TL-208	6.83E-01	1.13E-01	7.33E-02
U-235	Not Detected	--------	2.11E-01
TH-231	Not Detected	--------	2.44
PA-231	Not Detected	--------	1.29
TH-227	Not Detected	--------	3.31E-01
RA-223	Not Detected	--------	1.72E-01
RN-219	Not Detected	--------	3.48E-01
PB-211	Not Detected	--------	8.10E-01
TL-207	Not Detected	--------	1.19E+01
AM-241	Not Detected	--------	4.82E-01
PU-239	Not Detected	--------	2.74E+02
NP-237	Not Detected	--------	3.48E-01
PA-233	Not Detected	--------	5.34E-02
TH-229	Not Detected	--------	2.52E-01

[Summary Report] - Sample ID: 60019303

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.18E-02
AR-41	Not Detected	--------	9.19E+02
BA-133	Not Detected	--------	5.23E-02
BA-140	Not Detected	--------	1.00E-01
CD-109	Not Detected	--------	9.23E-01
CD-115	Not Detected	--------	8.16E-02
CE-139	Not Detected	--------	2.69E-02
CE-141	Not Detected	--------	4.85E-02
CE-144	Not Detected	--------	2.11E-01
CO-56	Not Detected	--------	3.20E-02
CO-57	Not Detected	--------	2.92E-02
CO-58	Not Detected	--------	2.86E-02
CO-60	Not Detected	--------	3.20E-02
CR-51	Not Detected	--------	2.15E-01
CS-134	Not Detected	--------	4.42E-02
CS-137	4.22E-02	1.63E-02	1.81E-02
CU-64	Not Detected	--------	2.86E+01
EU-152	Not Detected	--------	7.53E-02
EU-154	Not Detected	--------	1.68E-01
EU-155	Not Detected	--------	1.24E-01
FE-59	Not Detected	--------	6.41E-02
GD-153	Not Detected	--------	9.87E-02
HG-203	Not Detected	--------	2.61E-02
I-131	Not Detected	--------	2.73E-02
IN-115m	Not Detected	--------	3.73
IR-192	Not Detected	--------	2.55E-02
K-40	1.77E+01	2.41	2.94E-01
LA-140	Not Detected	--------	4.87E-02
MN-52	Not Detected	--------	3.13E-02
MN-54	Not Detected	--------	3.20E-02
MN-56	Not Detected	--------	4.42E+01
MO-99	Not Detected	--------	2.98E-01
NA-22	Not Detected	--------	3.68E-02
NA-24	Not Detected	--------	1.03E-01
NB-95	Not Detected	--------	1.90E-01
ND-147	Not Detected	--------	1.82E-01
NI-57	Not Detected	--------	6.73E-02
BE-07	Not Detected	--------	2.24E-01
RU-103	Not Detected	--------	2.44E-02
RU-106	Not Detected	--------	2.50E-01
SB-122	Not Detected	--------	4.59E-02
SB-124	Not Detected	--------	2.84E-02
SB-125	Not Detected	--------	7.53E-02
SC-46	Not Detected	--------	4.61E-02
SR-85	Not Detected	--------	3.35E-02
TA-182	Not Detected	--------	1.37E-01
TA-183	Not Detected	--------	4.81E-01
TE-132	Not Detected	--------	3.13E-02
TL-201	Not Detected	--------	1.81E-01
XE-133	Not Detected	--------	1.56E-01
Y-88	Not Detected	--------	2.65E-02
ZN-65	Not Detected	--------	9.14E-02
ZR-95	Not Detected	--------	5.42E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

3-13-96 5:18:48 PM

*Dept 7714 Survey No. _____

* Reviewed by: 3/14/96 *Use Only Surveyed by: _____

Customer : MIKE YOUNG (7585/1148)
Customer Sample ID : 027914-02
Lab Sample ID : 60019304

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 919.000 gram
Sample Date/Time : 3-12-96 1:26:00 AM
Acquire Start Date : 3-13-96 3:29:57 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	8.60E-01	8.97E-01	1.40
TH-234	8.31E-01	2.34E-01	3.11E-01
RA-226	1.26	4.11E-01	5.25E-01
PB-214	5.01E-01	1.08E-01	5.21E-02
BI-214	4.78E-01	8.81E-02	5.47E-02
TH-232	7.99E-01	3.92E-01	1.85E-01
RA-228	8.13E-01	3.35E-01	1.34E-01
AC-228	6.61E-01	1.63E-01	1.77E-01
TH-228	Not Detected	--------	5.71E-01
RA-224	7.76E-01	2.16E-01	1.01E-01
PB-212	6.91E-01	1.50E-01	3.06E-02
BI-212	7.89E-01	3.38E-01	4.77E-01
TL-208	6.53E-01	1.23E-01	8.58E-02
U-235	~~8.51E-02~~	~~1.11E-01~~	1.55E-01 Not detected 3/14/96
TH-231	Not Detected	--------	1.26
PA-231	Not Detected	--------	1.13
TH-227	Not Detected	--------	2.93E-01
RA-223	Not Detected	--------	9.59E-02
RN-219	Not Detected	--------	3.20E-01
PB-211	Not Detected	--------	7.36E-01
TL-207	Not Detected	--------	1.26E+01
AM-241	Not Detected	--------	1.22E-01
PU-239	Not Detected	--------	2.93E+02
NP-237	Not Detected	--------	1.91E-01
PA-233	Not Detected	--------	4.89E-02
TH-229	Not Detected	--------	1.49E-01

[Summary Report] - Sample ID: 60019304

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.41E-02
AR-41	Not Detected	--------	9.65E+04
BA-133	Not Detected	--------	4.86E-02
BA-140	Not Detected	--------	9.97E-02
CD-109	Not Detected	--------	4.96E-01
CD-115	Not Detected	--------	9.52E-02
CE-139	Not Detected	--------	2.09E-02
CE-141	Not Detected	--------	3.59E-02
CE-144	Not Detected	--------	1.45E-01
CO-56	Not Detected	--------	3.00E-02
CO-57	Not Detected	--------	1.89E-02
CO-58	Not Detected	--------	2.77E-02
CO-60	Not Detected	--------	3.37E-02
CR-51	Not Detected	--------	1.91E-01
CS-134	Not Detected	--------	4.34E-02
CS-137	5.78E-02	1.88E-02	2.32E-02
CU-64	Not Detected	--------	5.97E+01
EU-152	Not Detected	--------	7.31E-02
EU-154	Not Detected	--------	1.50E-01
EU-155	Not Detected	--------	7.43E-02
FE-59	Not Detected	--------	6.87E-02
GD-153	Not Detected	--------	5.77E-02
HG-203	Not Detected	--------	2.39E-02
I-131	Not Detected	--------	2.64E-02
IN-115m	Not Detected	--------	2.36E+01
IR-192	Not Detected	--------	2.33E-02
K-40	1.66E+01	2.29	3.21E-01
LA-140	Not Detected	--------	6.15E-02
MN-52	Not Detected	--------	3.21E-02
MN-54	Not Detected	--------	3.13E-02
MN-56	Not Detected	--------	1.03E+03
MO-99	Not Detected	--------	3.42E-01
NA-22	Not Detected	--------	4.09E-02
NA-24	Not Detected	--------	1.78E-01
NB-95	Not Detected	--------	1.86E-01
ND-147	Not Detected	--------	1.85E-01
NI-57	Not Detected	--------	8.66E-02
BE-07	Not Detected	--------	2.13E-01
RU-103	Not Detected	--------	2.44E-02
RU-106	~~1.48E-01~~	~~1.37E-01~~	2.16E-01
SB-122	Not Detected	--------	5.12E-02
SB-124	Not Detected	--------	2.85E-02
SB-125	Not Detected	--------	7.03E-02
SC-46	Not Detected	--------	4.79E-02
SR-85	Not Detected	--------	3.29E-02
TA-182	Not Detected	--------	1.41E-01
TA-183	Not Detected	--------	1.30E-01
TE-132	Not Detected	--------	2.93E-02
TL-201	Not Detected	--------	8.65E-02
XE-133	Not Detected	--------	9.53E-02
Y-88	Not Detected	--------	2.33E-02
ZN-65	Not Detected	--------	9.47E-02
ZR-95	Not Detected	--------	5.46E-02

Not detected 3/14/96

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-13-96 3:44:13 PM *
****
* *Dept 7714 Survey No._____ *
* Reviewed by: 3/14/96 *Use Only Surveyed by:_____ *
****

Customer : MIKE YOUNG (7585/1148)
Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
Lab Sample ID : 60019305

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 3-13-96 3:31:33 PM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:
****

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.35E+04
TH-234	Not Detected	--------	4.87E+03
RA-226	Not Detected	--------	6.39E+03
PB-214	Not Detected	--------	6.43E+02
BI-214	Not Detected	--------	6.35E+02
TH-232	Not Detected	--------	2.02E+03
RA-228	Not Detected	--------	2.90E+03
AC-228	Not Detected	--------	1.63E+03
TH-228	Not Detected	--------	4.62E+04
RA-224	Not Detected	--------	1.60E+03
PB-212	Not Detected	--------	3.48E+03
BI-212	Not Detected	--------	3.22E+04
TL-208	Not Detected	--------	6.40E+03
U-235	Not Detected	--------	1.81E+03
TH-231	Not Detected	--------	1.76E+04
PA-231	Not Detected	--------	1.38E+04
TH-227	Not Detected	--------	2.36E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.25E+03
PB-211	Not Detected	--------	1.19E+04
TL-207	Not Detected	--------	2.16E+05
AM-241	8.86E+04	1.49E+04	5.15E+03
PU-239	Not Detected	--------	3.38E+06
NP-237	Not Detected	--------	2.63E+03
PA-233	Not Detected	--------	5.95E+02
TH-229	Not Detected	--------	2.13E+03

[Summary Report] - Sample ID: 60019305

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	--------	3.50E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.57E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.64E+05	1.60E+05	1.25E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	4.57E+06
CE-141	Not Detected	--------	5.73E+20
CE-144	Not Detected	--------	2.18E+05
CO-56	Not Detected	--------	1.73E+10
CO-57	Not Detected	--------	3.77E+04
CO-58	Not Detected	--------	7.36E+10
CO-60	7.41E+04	9.80E+03	3.34E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	1.77E+03
CS-137	6.73E+04	8.71E+03	5.30E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.15E+03
EU-154	Not Detected	--------	2.32E+03
EU-155	Not Detected	--------	2.31E+03
FE-59	Not Detected	--------	1.59E+16
GD-153	Not Detected	--------	2.28E+05
HG-203	Not Detected	--------	1.16E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.68E+10
K-40	Not Detected	--------	1.73E+03
LA-140	Not Detected	--------	1.00E+26
MN-52	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	2.88E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	9.20E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	3.76E+14
RU-103	Not Detected	--------	3.40E+17
RU-106	Not Detected	--------	1.17E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	1.79E+12
SB-125	Not Detected	--------	4.13E+03
SC-46	Not Detected	--------	4.82E+09
SR-85	Not Detected	--------	4.24E+11
TA-182	Not Detected	--------	1.72E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	5.91E+07
ZN-65	Not Detected	--------	2.43E+05
ZR-95	Not Detected	--------	9.91E+11

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 3-13-96 3:48:07 PM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 60019305
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 3-13-96 3:31:33 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.302E-02	4.032E-03	8.858E-02	<	:In	:	>
CS-137 Activity	6.862E-02	2.076E-03	6.728E-02	<	:	:	>
CO-60 Activity	7.514E-02	1.584E-03	7.357E-02	<	:	:	>

ok 3/14/96

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 3/14/96

002

RAD PROT 7714

505 845 3375

07:55

03/13/96

Survey Number: 3-96-0216

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept.	Date	Time	Duration
E.R. SITE #58F	#7585	3-12-96	1415 - 1730	N/A

Purpose	Request #	RWP #
RELEASE OF SAMPLES + EQUIPMENT	N/A	N/A

Instrument and Probe Type and Serial Number	Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1 / HP-260 / # 1407	JOHN P. Kilbane	John P Kilbane
BICRON MICRO REM # B216L		
TENNELEC LB-5100		

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. 20 /Isotope UNKNOWN: cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	ALPHA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. N/A /Isotope N/A: cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	RADIATION SURVEY Bkg. .009: mrem/hr (3)	Distance
1	SAMPLE BOTTLES GROUP #027896	80	80	ND	T					<.02	CONTACT
2	#027897										
3	#027898										
4	#027900										
5	#027901										
6	#027902					N/A					
7	#027903										
8	#027905										
9	#027906										
10	#027907										
11	#027908										
12	#027910										

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, if other than gamma (i.e. n or β).

Remarks:

Reviewed by:

003
RAD PROT 7714
505 845 3375
07:58
03/13/96

Survey Number: 3-96-0216

RADIOLOGICAL SURVEY FORM CONTINUATION

Location: E.R. SITE # 58F

Purpose: SAMPLES + EQUIPMENT

Date: 3-6-96

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. 20 /Isotope UNKNOWN				ALPHA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. N/A /Isotope N/A				RADIATION SURVEY Bkg. .009	
		cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	mrem/hr (3)	Distance
13	SAMPLE BOTTLES GROUP # 027911	80	80	ND	T					<.01	CONTACT
14	# 027912										
15	# 027913										
16	# 027915										
17	# 027918										
18	RINSE ATES - WATER										
19	(2) SMALL SHOVELS										
	N/A		N/A				N/A				N/A

RPOP-009.a
ver 950612

Survey No. 3-96-0216

Radiation Protection Sample Diagnostics (7715) TA-III BLDG 6921
Smear Analysis

Date: 3/12/96
Counting Unit id: 1 (SNL# S674564)
Data file name: C:\LBXL\UNIT1\63005406.XLD
Batch Ended: 3/12/96 17:03
Crosstalk Correction: Applied
ANALYZED BY KILBANE
REVIEWED BY JPK
Batch ID: E.R. #58F SAMPLE RELEASE 3-12-96

Alpha activity action level (DPM): 200.00
Beta activity action level (DPM): 1000.00
Certainty level for MDA and flags: 95.00%
High Voltage Setting: 1390
Application Revision: 3
Application Version: Standard

Alpha efficiency log file: pu238ab
Alpha Efficiency: 43.06%
Alpha to Beta Crosstalk: 10.90%
Alpha Background (CPM): 0.25
Alpha Correction Factor: 1.000
Beta efficiency log file: cl36ab
Beta Efficiency: 54.11%
Beta into Alpha Crosstalk: 0.85%
Beta Background (CPM): 2.65
Beta Correction Factor: 1.000

	Alpha Activity				Beta Activity				count	Alpha	Beta	Time
ID	DPM	σ	flags	MDA	DPM	σ	flags	MDA	Time	CPM	CPM	Complt
1	1.91	2.71	<MDA	11.32	4.21	4.23	<MDA	15.41	1.00	0.75	2.35	16:42
2	-0.59	2.65	<MDA	10.51	-4.89	1.99	<MDA	15.19	1.00	-0.25	-2.65	16:43
3	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	16:44
4	4.58	3.74	<AL	10.99	0.25	3.30	<MDA	15.63	1.00	1.75	0.35	16:45
5	1.97	2.66	<MDA	10.04	-1.39	2.73	<MDA	15.41	1.00	0.75	-0.65	16:47
6	4.49	3.77	<AL	11.45	5.85	4.62	<AL	15.63	1.00	1.75	3.35	16:48
7	-0.68	2.69	<MDA	11.19	2.58	3.79	<MDA	16.18	1.00	-0.25	1.35	16:49
8	1.97	2.66	<MDA	10.84	-1.39	2.73	<MDA	15.41	1.00	0.75	-0.65	16:50
9	2.00	2.65	<MDA	10.67	-3.25	1.99	<MDA	15.41	1.00	0.75	-1.65	16:51
10	1.82	2.77	<MDA	11.90	11.68	5.65	<AL	15.40	1.00	0.75	6.35	16:52
11	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	16:54
12	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	16:55
13	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	16:56
14	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	16:57
15	1.91	2.71	<MDA	11.32	4.21	4.23	<MDA	15.41	1.00	0.75	2.35	16:58
16	-0.68	2.69	<MDA	11.19	2.58	3.79	<MDA	15.18	1.00	-0.25	1.35	16:59
17	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	17:01
18	4.49	3.77	<AL	11.45	5.85	4.62	<AL	15.63	1.00	1.75	3.35	17:02
19	-0.68	2.69	<MDA	11.19	2.58	3.79	<MDA	15.18	1.00	-0.25	1.35	17:03

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 2

SF 2001-COC (6-95)

Internal Lab Batch No. _____

ER Site 58F AMIR-IN-HOUSE

AR/COC- 04944

Dept. No./Mail Stop: 7585/11423 95
Project/Task Manager: Mike Young (284-2522
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/TAT
Logbook Ref No: 0155
Service Order No.: CF0180

Date Samples Shipped: _____
Carrier/Waybill No.: _____
Lab Contact: AMIR Mohagheghi (7715)
Lab Destination: AMIR (844-6710)
SMO Contact/Phone: Doug Salmi (848-0962)
Send Report to SMO _____

Contract No.: _____
Case No.: 8835.110
SMO Authorization: _____
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location Tech Area III
Building _____ Room _____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: Gamma Spec	Lab Sample ID
027396-02	58F-GR-001-0.0-SS	0.0	58F	3-12-96 10:00	Soil	Poly	500ml	4°C	G	SA	X	
027897-02	58F-GR-002-0.0-SS	0.0	58F	3-12-96 10:15	Soil	P	500ml	4°C	G	SA	X	
027898-02	58F-GR-003-0.0-SS	0.0	58F	3-12-96 10:23	Soil	P	500ml	4°C	G	SA	X	
027901-02	58F-GR-005-0.0-SS	"	"	3-12-96 10:340	"	"	"	"	"	"	X	
027902-02	58F-GR-006-0.0-SS	"	"	3-12-96 10:45	"	"	"	"	"	"	X	
027903-02	58F-GR-007-0.0-SS	"	"	3-12-96 10:51	"	"	"	"	"	"	X	
027906-02	58F-GR-009-0.0-SS	"	"	3-12-96 11:06	"	"	"	"	"	"	X	
027907-02	58F-GR-010-0.0-SS	"	"	3-12-96 11:10	"	"	"	"	"	"	X	
027908-02	58F-GR-011-0.0-SS	"	"	3-12-96 11:16	"	"	"	"	"	"	X	
X 027909-02	58F-GR-012-0.0-SS	"	"	3-12-96	"	"	"	"	"	"	X	CC 3-12-96

RMMA ☑ Yes ☐ No Ref. No. _____

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☑ Normal ☐ Rush Required Report Date _____

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) _____
Entered by: _____
QC inits. _____

Special Instructions/QC Requirements
- Please send report to Mike Young.

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Corretta Carcisto	Corretta Carcisto	CC	Lamb/7584/284-3301
	Rob Nagel	Rob Nagel	RN	IT/7594
	Gilbert Quintana	Gilbert Quintana		

1. Relinquished by		Org.		Date		Time		
1. Received by	Doug Simmons	Org.	7713	Date	3/13/96	Time	1000	
2. Relinquished by		Org.		Date		Time		
2. Received by		Org.		Date		Time		
3. Relinquished by		Org.		Date		Time		
3. Received by		Org.		Date		Time		
4. Relinquished by		Org.		Date		Time		
4. Received by		Org.		Date		Time		
5. Relinquished by		Org.		Date		Time		
5. Received by		Org.		Date		Time		
6. Relinquished by		Org.		Date		Time		
6. Received by		Org.		Date		Time		

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

SF 2001-COD (9-94) AMIR-IN-HOUSE CONTINUED

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC- 04944

58F

Project Name: Foothills Test Area Project/Task Manager: MIKE YOUNG Case No.: 8835.110

Location Tech Area III

Building _____ Room _____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Parameter & Method Requested										Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	GAMMA SPEC										
02791 1 1 - 02	58F-GR-013-0.0-SS	0.0	58F	3-12-96 1250	Soil	Poly	500ml	4°C	G	SA	X										
02791 2 - 02	58F-GR-014-0.0-SS	"	"	3-12-96 1257	"	"	"	"	"	"	X										
02791 3 - 02	58F-GR-015-0.0-SS	"	"	3-12-96 1303	"	"	"	"	"	"	X										
02791 5 - 02	58F-GR-016-0.0-SS	"	"	3-12-96 1326	"	"	"	"	G	DU	X										
02791 8 - 02	58F-GR-017-0.0-SS	"	"	3-12-96 1332	"	"	"	"	"	SA	X										TAB
~~02791 9 - 02~~	~~58F-GR-018-0.0-SS~~	"	"	3-12-96	"	"	"	"	"	"	X	CC 3-12-96									DUP
02830 6 0 - 12	58F-GR-018-0.0-EB SS	—	"	3-12-96 1345	Water	Poly	"	4°	G	EB	X										
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	-																				
	-																				

Abnormal Conditions on Receipt

Recipient Initials _____

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics ER Site 58F AMIR. IN-HOUSE

Sample Analysis Request Form
Page 1 of 2

To be completed by Customer This goes with COC# 04944 *Shaded areas are for RPSD use only*

Customer: Mike Young
Organization: 7585 / 1148 ms
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed:
Suspect Isotopes:
Other Information: COC # 04944

Hazards/Special Instructions:
• Please send report to Mike Young (1148) ms

Batch Log Number: 600195
Logged By:

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

	Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
1	027896-02	Soil	3-12-96 10:00	500 ml	Gamma Spec.	01	< 300	777	
2	027897-02	"	3-12-96 10:15	"	"	02		823	
3	027898-02	"	3-12-96 10:23	"	"	03		822	
5	027901-02	"	3-12-96 10:40	"	"	04		769	
6	027902-02	"	3-12-96 10:45	"	"	05		798	
7	027903-02	"	3-12-96 10:51	"	"	06		876	
9	027906-02	"	3-12-96 11:06	"	"	07		968	
10	027907-02	"	3-12-96 11:10	"	"	08		827	
11	027908-02	"	3-12-96 11:16	"	"	09		829	
13	027911-02	"	3-12-96 1250	"	"	10		902	
14	027912-02	"	3-12-96 1257	"	"	11		910	
15	027913-02	"	3-12-96 1303	"	"	12		859	
16	027915-02	"	3-12-96 1326	"	"	13	↓	901	
17	027918-02	"	3-12-96 1338	"	"	14	< 300	900	

Relinquished by	Date 3/13/96	Time 1000	Received by	Date 3/13/96	Time 1000
Relinquished by	Date 3/26/96	Time 1420	Received by	Date 3-26-96	Time 1420
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics ER Site 58F AMIR-IN-HOUSE

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer This goes with COC# 04944

Shaded areas are for RPSD use only

Customer : Mike Young
Organization: 7585/1148ms
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: _____
Suspect Isotopes: _____
Other Information: COC # 04944

Hazards/Special Instructions:

Batch Log Number: 600195
Logged By: [illegible]

Analysis Type:
- ☑ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login _____
Results Faxed _____
Sample Disposal _____

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
028060-12	Water	3-12-96 1345	500ml	Gamma Spec.	15	2700	N/A	
LCS	—	1NOV90	—	γ spec	16	N/A	N/A	

Relinquished by Rod Nagel Date 3/13/96 Time 1000 Received by Gary Simmons Date 3/13/96 Time 1000
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

```
**********************************************************************
*                    Sandia National Laboratories                    *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]*
*                      3-17-96 12:36:37 AM                           *
**********************************************************************
*                                   *Dept. 7714                      *
* Reviewed by: SJM 3/19/96          *Use Only - Survey No._____      *
**********************************************************************

Customer           : M.YOUNG (7585)
Customer Sample ID : 027896-02
Lab Sample ID      : 60019501

Sample Description : MARINELLI SOLID SAMPLE
Sample Type        : Solid
Sample Geometry    : 1SMAR
Sample Quantity    :   777.000  gram
Sample Date/Time   :  3-12-96  10:00:00 AM
Acquire Start Date :  3-16-96  10:53:53 PM
Detector Name      : LAB01
Elapsed Live Time  :   6000 seconds
Elapsed Real Time  :   6003 seconds

Comments:
**********************************************************************
```

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.34
TH-234	Not Detected	--------	6.10E-01
RA-226	1.42	4.42E-01	5.73E-01
PB-214	6.16E-01	1.10E-01	7.78E-02
BI-214	5.79E-01	1.04E-01	7.23E-02
TH-232	8.38E-01	3.97E-01	1.93E-01
RA-228	7.71E-01	2.04E-01	1.48E-01
AC-228	9.27E-01	1.90E-01	1.53E-01
TH-228	Not Detected	--------	7.23E-01
RA-224	8.79E-01	2.34E-01	8.04E-02
PB-212	8.33E-01	1.50E-01	3.65E-02
BI-212	8.56E-01	3.15E-01	4.10E-01
TL-208	7.93E-01	1.48E-01	1.24E-01
U-235	Not Detected	--------	1.82E-01
TH-231	Not Detected	--------	1.80
PA-231	Not Detected	--------	1.30
TH-227	Not Detected	--------	3.37E-01
RA-223	Not Detected	--------	1.61E-01
RN-219	Not Detected	--------	3.76E-01
PB-211	Not Detected	--------	8.38E-01
TL-207	Not Detected	--------	1.44E+01
AM-241	Not Detected	--------	1.63E-01
PU-239	Not Detected	--------	3.32E+02
NP-237	Not Detected	--------	2.60E-01
PA-233	Not Detected	--------	5.62E-02
TH-229	Not Detected	--------	1.96E-01

♀

[Summary Report] - Sample ID: 60019501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.89E-02
AR-41	Not Detected	--------	5.37E+16
BA-133	Not Detected	--------	3.89E-02
BA-140	Not Detected	--------	1.45E-01
CD-109	Not Detected	--------	8.94E-01
CD-115	Not Detected	--------	2.73E-01
CE-139	Not Detected	--------	2.57E-02
CE-141	Not Detected	--------	4.55E-02
CE-144	Not Detected	--------	1.79E-01
CO-56	Not Detected	--------	3.91E-02
CO-57	Not Detected	--------	2.29E-02
CO-58	Not Detected	--------	3.49E-02
CO-60	Not Detected	--------	4.03E-02
CR-51	Not Detected	--------	2.40E-01
CS-134	Not Detected	--------	4.29E-02
CS-137	6.25E-02	2.21E-02	2.87E-02
CU-64	Not Detected	--------	2.95E+03
EU-152	Not Detected	--------	8.12E-02
EU-154	Not Detected	--------	1.85E-01
EU-155	Not Detected	--------	9.72E-02
FE-59	Not Detected	--------	8.11E-02
GD-153	Not Detected	--------	7.75E-02
HG-203	Not Detected	--------	2.94E-02
I-131	Not Detected	--------	3.95E-02
IN-115m	Not Detected	--------	1.53E+06
IR-192	Not Detected	--------	2.71E-02
K-40	1.76E+01	2.44	3.79E-01
LA-140	Not Detected	--------	2.53E-01
MN-52	Not Detected	--------	5.82E-02
MN-54	Not Detected	--------	3.77E-02
MN-56	Not Detected	--------	2.42E+11
MO-99	Not Detected	--------	8.54E-01
NA-22	Not Detected	--------	4.88E-02
NA-24	Not Detected	--------	5.33
NB-95	Not Detected	--------	3.09E-01
ND-147	Not Detected	--------	2.70E-01
NI-57	Not Detected	--------	4.12E-01
BE-07	Not Detected	--------	2.56E-01
RU-103	Not Detected	--------	2.92E-02
RU-106	Not Detected	--------	2.95E-01
SB-122	Not Detected	--------	1.30E-01
SB-124	Not Detected	--------	3.26E-02
SB-125	Not Detected	--------	7.69E-02
SC-46	Not Detected	--------	5.76E-02
SR-85	Not Detected	--------	3.95E-02
TA-182	Not Detected	--------	1.69E-01
TA-183	Not Detected	--------	2.58E-01
TE-132	Not Detected	--------	6.24E-02
TL-201	Not Detected	--------	2.14E-01
XE-133	Not Detected	--------	3.38E-01
Y-88	Not Detected	--------	3.14E-02
ZN-65	Not Detected	--------	1.12E-01
ZR-95	Not Detected	--------	6.50E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-17-96 2:24:06 AM *
****
* *Dept. 7714 *
* Reviewed by: AMM 3/19/96 *Use Only - Survey No._____ *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027897-02
Lab Sample ID : 60019502

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 1SMAR
Sample Quantity : 823.000 gram
Sample Date/Time : 3-12-96 10:15:00 AM
Acquire Start Date : 3-17-96 12:41:23 AM
Detector Name : LAB01
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.30
TH-234	Not Detected	--------	5.32E-01
RA-226	1.13	5.72E-01	8.58E-01
PB-214	5.91E-01	1.06E-01	7.68E-02
BI-214	5.42E-01	9.49E-02	5.82E-02
TH-232	8.37E-01	4.07E-01	2.46E-01
RA-228	7.42E-01	1.93E-01	1.48E-01
AC-228	8.20E-01	1.63E-01	1.14E-01
TH-228	2.80E-01	3.79E-01	6.13E-01
RA-224	8.09E-01	2.21E-01	1.07E-01
PB-212	7.89E-01	1.38E-01	3.65E-02
BI-212	6.36E-01	2.92E-01	4.10E-01
TL-208	6.80E-01	1.19E-01	7.97E-02
U-235	Not Detected	--------	1.73E-01
TH-231	Not Detected	--------	1.69
PA-231	Not Detected	--------	1.31
TH-227	Not Detected	--------	3.22E-01
RA-223	Not Detected	--------	1.52E-01
RN-219	Not Detected	--------	3.52E-01
PB-211	Not Detected	--------	7.88E-01
TL-207	Not Detected	--------	1.37E+01
AM-241	Not Detected	--------	1.67E-01
PU-239	Not Detected	--------	3.08E+02
NP-237	Not Detected	--------	2.50E-01
PA-233	Not Detected	--------	5.40E-02
TH-229	Not Detected	--------	1.88E-01

♀

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.50E-02
AR-41	Not Detected	--------	8.90E+16
BA-133	Not Detected	--------	3.71E-02
BA-140	Not Detected	--------	1.35E-01
CD-109	Not Detected	--------	8.56E-01
CD-115	Not Detected	--------	2.66E-01
CE-139	Not Detected	--------	2.45E-02
CE-141	Not Detected	--------	4.32E-02
CE-144	Not Detected	--------	1.69E-01
CO-56	Not Detected	--------	3.50E-02
CO-57	Not Detected	--------	2.21E-02
CO-58	Not Detected	--------	3.32E-02
CO-60	Not Detected	--------	3.73E-02
CR-51	Not Detected	--------	2.38E-01
CS-134	Not Detected	--------	3.89E-02
CS-137	1.74E-01	3.49E-02	3.13E-02
CU-64	Not Detected	--------	3.37E+03
EU-152	Not Detected	--------	7.75E-02
EU-154	Not Detected	--------	1.76E-01
EU-155	Not Detected	--------	9.31E-02
FE-59	Not Detected	--------	7.62E-02
GD-153	Not Detected	--------	7.48E-02
HG-203	Not Detected	--------	3.01E-02
I-131	Not Detected	--------	3.84E-02
IN-115m	Not Detected	--------	1.86E+06
IR-192	Not Detected	--------	2.64E-02
K-40	1.74E+01	2.40	3.59E-01
LA-140	Not Detected	--------	2.47E-01
MN-52	Not Detected	--------	5.00E-02
MN-54	Not Detected	--------	3.64E-02
MN-56	Not Detected	--------	3.28E+11
MO-99	Not Detected	--------	8.18E-01
NA-22	Not Detected	--------	4.30E-02
NA-24	Not Detected	--------	5.53
NB-95	Not Detected	--------	3.00E-01
ND-147	Not Detected	--------	2.55E-01
NI-57	Not Detected	--------	4.26E-01
BE-07	Not Detected	--------	2.51E-01
RU-103	Not Detected	--------	2.94E-02
RU-106	Not Detected	--------	3.02E-01
SB-122	Not Detected	--------	1.27E-01
SB-124	Not Detected	--------	2.95E-02
SB-125	Not Detected	--------	8.04E-02
SC-46	Not Detected	--------	5.60E-02
SR-85	Not Detected	--------	3.68E-02
TA-182	Not Detected	--------	1.66E-01
TA-183	Not Detected	--------	2.67E-01
TE-132	Not Detected	--------	6.00E-02
TL-201	Not Detected	--------	2.06E-01
XE-133	Not Detected	--------	3.28E-01
Y-88	Not Detected	--------	2.99E-02
ZN-65	Not Detected	--------	1.05E-01
ZR-95	Not Detected	--------	6.05E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-17-96 4:11:41 AM *
****
* *Dept. 7714 *
* Reviewed by: AMM 3/19/96 *Use Only - Survey No._____ *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027898-02
Lab Sample ID : 60019503

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 1SMAR
Sample Quantity : 822.000 gram
Sample Date/Time : 3-12-96 10:23:00 AM
Acquire Start Date : 3-17-96 2:28:55 AM
Detector Name : LAB01
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.28
TH-234	Not Detected	--------	5.25E-01
RA-226	1.25	3.86E-01	4.97E-01
PB-214	6.10E-01	1.04E-01	6.24E-02
BI-214	6.27E-01	1.06E-01	5.79E-02
TH-232	8.49E-01	4.03E-01	2.02E-01
RA-228	8.72E-01	2.70E-01	1.62E-01
AC-228	8.98E-01	1.77E-01	1.24E-01
TH-228	Not Detected	--------	6.78E-01
RA-224	8.12E-01	2.23E-01	1.11E-01
PB-212	8.42E-01	1.45E-01	3.74E-02
BI-212	6.94E-01	3.07E-01	4.29E-01
TL-208	7.76E-01	1.35E-01	9.12E-02
U-235	Not Detected	--------	1.75E-01
TH-231	Not Detected	--------	1.73
PA-231	Not Detected	--------	1.32
TH-227	Not Detected	--------	3.29E-01
RA-223	Not Detected	--------	1.54E-01
RN-219	Not Detected	--------	3.65E-01
PB-211	Not Detected	--------	8.18E-01
TL-207	Not Detected	--------	1.44E+01
AM-241	Not Detected	--------	1.67E-01
PU-239	Not Detected	--------	3.24E+02
NP-237	Not Detected	--------	2.49E-01
PA-233	Not Detected	--------	5.34E-02
TH-229	Not Detected	--------	1.93E-01

♀

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.53E-02
AR-41	Not Detected	--------	1.68E+17
BA-133	Not Detected	--------	3.95E-02
BA-140	Not Detected	--------	1.35E-01
CD-109	Not Detected	--------	8.67E-01
CD-115	Not Detected	--------	2.78E-01
CE-139	Not Detected	--------	2.46E-02
CE-141	Not Detected	--------	4.38E-02
CE-144	Not Detected	--------	1.72E-01
CO-56	Not Detected	--------	3.62E-02
CO-57	Not Detected	--------	2.28E-02
CO-58	Not Detected	--------	3.31E-02
CO-60	Not Detected	--------	3.64E-02
CR-51	Not Detected	--------	2.34E-01
CS-134	Not Detected	--------	4.01E-02
CS-137	4.38E-02	2.65E-02	4.00E-02
CU-64	Not Detected	--------	3.52E+03
EU-152	Not Detected	--------	7.94E-02
EU-154	Not Detected	--------	1.78E-01
EU-155	Not Detected	--------	9.41E-02
FE-59	Not Detected	--------	7.84E-02
GD-153	Not Detected	--------	7.48E-02
HG-203	Not Detected	--------	2.87E-02
I-131	Not Detected	--------	3.91E-02
IN-115m	Not Detected	--------	2.45E+06
IR-192	Not Detected	--------	2.65E-02
K-40	1.70E+01	2.35	2.93E-01
LA-140	Not Detected	--------	2.63E-01
MN-52	Not Detected	--------	5.11E-02
MN-54	Not Detected	--------	3.54E-02
MN-56	Not Detected	--------	5.28E+11
MO-99	Not Detected	--------	8.07E-01
NA-22	Not Detected	--------	4.67E-02
NA-24	Not Detected	--------	5.78
NB-95	Not Detected	--------	3.14E-01
ND-147	Not Detected	--------	2.43E-01
NI-57	Not Detected	--------	4.20E-01
BE-07	Not Detected	--------	2.47E-01
RU-103	Not Detected	--------	2.98E-02
RU-106	Not Detected	--------	2.71E-01
SB-122	Not Detected	--------	1.34E-01
SB-124	Not Detected	--------	3.01E-02
SB-125	Not Detected	--------	7.95E-02
SC-46	Not Detected	--------	5.73E-02
SR-85	Not Detected	--------	3.75E-02
TA-182	Not Detected	--------	1.66E-01
TA-183	Not Detected	--------	2.70E-01
TE-132	Not Detected	--------	6.45E-02
TL-201	Not Detected	--------	2.15E-01
XE-133	Not Detected	--------	3.35E-01
Y-88	Not Detected	--------	2.90E-02
ZN-65	Not Detected	--------	1.08E-01
ZR-95	Not Detected	--------	6.22E-02

```
**********************************************************************
*                  Sandia National Laboratories                      *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]  *
*                     3-17-96 10:08:34 AM                            *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: JAM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer            : M.YOUNG (7585)
Customer Sample ID  : 027901-02
Lab Sample ID       : 60019504

Sample Description  : MARINELLI SOLID SAMPLE
Sample Type         : Solid
Sample Geometry     : 1SMAR
Sample Quantity     :   769.000  gram
Sample Date/Time    :  3-12-96  10:40:00 AM
Acquire Start Date  :  3-17-96   8:25:49 AM
Detector Name       : LAB01
Elapsed Live Time   :   6000 seconds
Elapsed Real Time   :   6003 seconds

Comments:
**********************************************************************
```

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.35
TH-234	9.33E-01	2.83E-01	3.70E-01
RA-226	1.29	4.70E-01	6.50E-01
PB-214	6.71E-01	1.13E-01	6.02E-02
BI-214	6.02E-01	1.05E-01	6.47E-02
TH-232	7.44E-01	3.57E-01	1.93E-01
RA-228	8.07E-01	2.17E-01	1.66E-01
AC-228	8.79E-01	1.77E-01	1.29E-01
TH-228	Not Detected	--------	7.11E-01
RA-224	8.90E-01	2.42E-01	1.14E-01
PB-212	9.46E-01	1.63E-01	3.61E-02
BI-212	1.10	3.46E-01	4.22E-01
TL-208	8.02E-01	1.43E-01	1.06E-01
U-235	Not Detected	--------	1.81E-01
TH-231	Not Detected	--------	1.85
PA-231	Not Detected	--------	1.32
TH-227	Not Detected	--------	3.54E-01
RA-223	Not Detected	--------	1.69E-01
RN-219	Not Detected	--------	3.97E-01
PB-211	Not Detected	--------	8.88E-01
TL-207	Not Detected	--------	1.42E+01
AM-241	Not Detected	--------	1.73E-01
PU-239	Not Detected	--------	3.48E+02
NP-237	Not Detected	--------	1.97E-01
PA-233	Not Detected	--------	5.39E-02
TH-229	Not Detected	--------	2.04E-01

♀

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.69E-02
AR-41	Not Detected	--------	1.58E+18
BA-133	Not Detected	--------	4.07E-02
BA-140	Not Detected	--------	1.43E-01
CD-109	Not Detected	--------	9.28E-01
CD-115	Not Detected	--------	3.09E-01
CE-139	Not Detected	--------	2.64E-02
CE-141	Not Detected	--------	4.58E-02
CE-144	Not Detected	--------	1.87E-01
CO-56	Not Detected	--------	3.76E-02
CO-57	Not Detected	--------	2.40E-02
CO-58	Not Detected	--------	3.53E-02
CO-60	Not Detected	--------	4.04E-02
CR-51	Not Detected	--------	2.55E-01
CS-134	Not Detected	--------	4.30E-02
CS-137	1.86E-02	2.19E-02	3.52E-02
CU-64	Not Detected	--------	5.26E+03
EU-152	Not Detected	--------	8.20E-02
EU-154	Not Detected	--------	1.91E-01
EU-155	Not Detected	--------	1.02E-01
FE-59	Not Detected	--------	8.60E-02
GD-153	Not Detected	--------	7.94E-02
HG-203	Not Detected	--------	3.11E-02
I-131	Not Detected	--------	4.26E-02
IN-115m	Not Detected	--------	6.08E+06
IR-192	Not Detected	--------	2.82E-02
K-40	1.76E+01	2.45	4.31E-01
LA-140	Not Detected	--------	3.07E-01
MN-52	Not Detected	--------	6.16E-02
MN-54	Not Detected	--------	2.90E-02
MN-56	Not Detected	--------	2.51E+12
MO-99	Not Detected	--------	9.56E-01
NA-22	Not Detected	--------	4.71E-02
NA-24	Not Detected	--------	8.22
NB-95	~~7.60E-02~~	~~5.84E-02~~	~~1.48E-01~~ N.D.
ND-147	Not Detected	--------	2.83E-01
NI-57	Not Detected	--------	4.94E-01
BE-07	Not Detected	--------	2.59E-01
RU-103	Not Detected	--------	3.10E-02
RU-106	Not Detected	--------	2.96E-01
SB-122	Not Detected	--------	1.51E-01
SB-124	Not Detected	--------	3.28E-02
SB-125	Not Detected	--------	8.50E-02
SC-46	Not Detected	--------	6.19E-02
SR-85	Not Detected	--------	4.07E-02
TA-182	Not Detected	--------	1.79E-01
TA-183	Not Detected	--------	2.89E-01
TE-132	Not Detected	--------	7.12E-02
TL-201	Not Detected	--------	2.36E-01
XE-133	Not Detected	--------	3.96E-01
Y-88	Not Detected	--------	3.18E-02
ZN-65	Not Detected	--------	1.18E-01
ZR-95	Not Detected	--------	6.61E-02

JDM 3/19/96

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**********************************************************************
*                    Sandia National Laboratories                    *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]*
*                      3-17-96 11:56:06 AM                           *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: JMM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer           : M.YOUNG (7585)
Customer Sample ID : 027902-02
Lab Sample ID      : 60019505

Sample Description : MARINELLI SOLID SAMPLE
Sample Type        : Solid
Sample Geometry    : 1SMAR
Sample Quantity    :   798.000  gram
Sample Date/Time   :  3-12-96  10:45:00 AM
Acquire Start Date :  3-17-96  10:13:24 AM
Detector Name      : LAB01
Elapsed Live Time  :   6000 seconds
Elapsed Real Time  :   6003 seconds

Comments:
**********************************************************************
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.32
TH-234	Not Detected	--------	5.39E-01
RA-226	1.19	4.92E-01	7.07E-01
PB-214	6.29E-01	1.10E-01	7.44E-02
BI-214	5.87E-01	1.02E-01	6.24E-02
TH-232	8.32E-01	3.89E-01	1.61E-01
RA-228	7.80E-01	2.03E-01	1.52E-01
AC-228	9.17E-01	1.79E-01	1.19E-01
TH-228	7.04E-01	3.58E-01	5.18E-01
RA-224	9.23E-01	2.46E-01	1.02E-01
PB-212	8.63E-01	1.49E-01	3.62E-02
BI-212	9.78E-01	3.43E-01	4.46E-01
TL-208	8.72E-01	1.50E-01	1.01E-01
U-235	1.10E-01	1.23E-01	1.79E-01
TH-231	Not Detected	--------	1.82
PA-231	Not Detected	--------	1.29
TH-227	Not Detected	--------	3.39E-01
RA-223	Not Detected	--------	1.63E-01
RN-219	Not Detected	--------	3.67E-01
PB-211	Not Detected	--------	8.28E-01
TL-207	Not Detected	--------	1.43E+01
AM-241	Not Detected	--------	1.72E-01
PU-239	Not Detected	--------	3.32E+02
NP-237	Not Detected	--------	2.52E-01
PA-233	Not Detected	--------	5.44E-02
TH-229	Not Detected	--------	1.98E-01

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[Summary Report] - Sample ID: 60019505

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.53E-02
AR-41	Not Detected	--------	2.61E+18
BA-133	Not Detected	--------	3.92E-02
BA-140	Not Detected	--------	1.39E-01
CD-109	Not Detected	--------	8.89E-01
CD-115	Not Detected	--------	3.23E-01
CE-139	Not Detected	--------	2.52E-02
CE-141	Not Detected	--------	4.47E-02
CE-144	Not Detected	--------	1.79E-01
CO-56	Not Detected	--------	3.85E-02
CO-57	Not Detected	--------	2.26E-02
CO-58	Not Detected	--------	3.56E-02
CO-60	Not Detected	--------	3.70E-02
CR-51	Not Detected	--------	2.40E-01
CS-134	Not Detected	--------	4.20E-02
CS-137	2.03E-02	1.90E-02	2.99E-02
CU-64	Not Detected	--------	5.29E+03
EU-152	Not Detected	--------	8.22E-02
EU-154	Not Detected	--------	1.95E-01
EU-155	Not Detected	--------	9.82E-02
FE-59	Not Detected	--------	7.84E-02
GD-153	Not Detected	--------	7.63E-02
HG-203	Not Detected	--------	3.04E-02
I-131	Not Detected	--------	3.87E-02
IN-115m	Not Detected	--------	8.10E+06
IR-192	Not Detected	--------	2.67E-02
K-40	1.66E+01	2.31	3.84E-01
LA-140	Not Detected	--------	3.26E-01
MN-52	Not Detected	--------	6.15E-02
MN-54	Not Detected	--------	3.66E-02
MN-56	Not Detected	--------	4.06E+12
MO-99	Not Detected	--------	9.73E-01
NA-22	Not Detected	--------	4.68E-02
NA-24	Not Detected	--------	8.89
NB-95	Not Detected	--------	3.45E-01
ND-147	Not Detected	--------	2.61E-01
NI-57	Not Detected	--------	5.17E-01
BE-07	Not Detected	--------	2.64E-01
RU-103	Not Detected	--------	2.88E-02
RU-106	Not Detected	--------	3.00E-01
SB-122	Not Detected	--------	1.52E-01
SB-124	Not Detected	--------	3.21E-02
SB-125	Not Detected	--------	8.03E-02
SC-46	Not Detected	--------	5.82E-02
SR-85	Not Detected	--------	4.05E-02
TA-182	Not Detected	--------	1.69E-01
TA-183	Not Detected	--------	2.90E-01
TE-132	Not Detected	--------	6.83E-02
TL-201	Not Detected	--------	2.30E-01
XE-133	Not Detected	--------	3.95E-01
Y-88	Not Detected	--------	2.75E-02
ZN-65	Not Detected	--------	1.11E-01
ZR-95	Not Detected	--------	6.52E-02

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**********************************************************************
*                    Sandia National Laboratories                    *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]*
*                       3-17-96  1:43:42 PM                          *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: RJM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer            : M.YOUNG (7585)
Customer Sample ID  : 027903-02
Lab Sample ID       : 60019506

Sample Description  : MARINELLI SOLID SAMPLE
Sample Type         : Solid
Sample Geometry     : 1SMAR
Sample Quantity     :   876.000  gram
Sample Date/Time    :  3-12-96  10:51:00 AM
Acquire Start Date  :  3-17-96  12:00:55 PM
Detector Name       : LAB01
Elapsed Live Time   :   6000 seconds
Elapsed Real Time   :   6003 seconds

Comments:
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.24
TH-234	8.27E-01	2.46E-01	3.41E-01
RA-226	1.54	5.34E-01	7.37E-01
PB-214	6.24E-01	1.04E-01	5.68E-02
BI-214	5.59E-01	9.71E-02	6.02E-02
TH-232	7.20E-01	3.57E-01	2.37E-01
RA-228	9.35E-01	2.18E-01	1.50E-01
AC-228	7.90E-01	1.59E-01	1.16E-01
TH-228	6.91E-01	2.55E-01	3.22E-01
RA-224	9.69E-01	2.52E-01	8.98E-02
PB-212	8.37E-01	1.43E-01	3.52E-02
BI-212	8.07E-01	2.64E-01	3.21E-01
TL-208	7.31E-01	1.26E-01	8.35E-02
U-235	Not Detected	--------	1.67E-01
TH-231	Not Detected	--------	1.70
PA-231	Not Detected	--------	1.26
TH-227	Not Detected	--------	3.21E-01
RA-223	Not Detected	--------	1.56E-01
RN-219	Not Detected	--------	3.42E-01
PB-211	Not Detected	--------	7.88E-01
TL-207	Not Detected	--------	1.33E+01
AM-241	Not Detected	--------	1.60E-01
PU-239	Not Detected	--------	3.15E+02
NP-237	Not Detected	--------	1.74E-01
PA-233	Not Detected	--------	5.13E-02
TH-229	Not Detected	--------	1.88E-01

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Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.59E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.57E-02
BA-140	Not Detected	--------	1.38E-01
CD-109	Not Detected	--------	8.41E-01
CD-115	Not Detected	--------	3.00E-01
CE-139	Not Detected	--------	2.39E-02
CE-141	Not Detected	--------	4.19E-02
CE-144	Not Detected	--------	1.69E-01
CO-56	Not Detected	--------	3.59E-02
CO-57	Not Detected	--------	2.11E-02
CO-58	Not Detected	--------	3.34E-02
CO-60	Not Detected	--------	3.67E-02
CR-51	Not Detected	--------	2.30E-01
CS-134	Not Detected	--------	3.99E-02
CS-137	6.27E-02	2.20E-02	2.26E-02
CU-64	Not Detected	--------	5.99E+03
EU-152	Not Detected	--------	7.72E-02
EU-154	Not Detected	--------	1.71E-01
EU-155	Not Detected	--------	9.39E-02
FE-59	Not Detected	--------	7.68E-02
GD-153	Not Detected	--------	7.29E-02
HG-203	Not Detected	--------	2.89E-02
I-131	Not Detected	--------	3.92E-02
IN-115m	Not Detected	--------	9.56E+06
IR-192	Not Detected	--------	2.54E-02
K-40	1.70E+01	2.34	2.97E-01
LA-140	Not Detected	--------	3.05E-01
MN-52	Not Detected	--------	5.44E-02
MN-54	Not Detected	--------	3.40E-02
MN-56	Not Detected	--------	5.98E+12
MO-99	Not Detected	--------	9.02E-01
NA-22	Not Detected	--------	4.32E-02
NA-24	Not Detected	--------	9.23
NB-95	Not Detected	--------	3.34E-01
ND-147	Not Detected	--------	2.56E-01
NI-57	Not Detected	--------	5.10E-01
BE-07	Not Detected	--------	2.32E-01
RU-103	Not Detected	--------	2.74E-02
RU-106	Not Detected	--------	2.72E-01
SB-122	Not Detected	--------	1.41E-01
SB-124	Not Detected	--------	3.04E-02
SB-125	Not Detected	--------	7.17E-02
SC-46	Not Detected	--------	5.41E-02
SR-85	Not Detected	--------	3.82E-02
TA-182	Not Detected	--------	1.58E-01
TA-183	Not Detected	--------	2.72E-01
TE-132	Not Detected	--------	6.52E-02
TL-201	Not Detected	--------	2.22E-01
XE-133	Not Detected	--------	3.73E-01
Y-88	Not Detected	--------	2.44E-02
ZN-65	Not Detected	--------	1.04E-01
ZR-95	Not Detected	--------	6.29E-02

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**********************************************************************
*                    Sandia National Laboratories                    *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]*
*                       3-17-96  3:31:12 PM                          *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: ADM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer            : M.YOUNG (7585)
Customer Sample ID  : 027906-02
Lab Sample ID       : 60019507

Sample Description  : MARINELLI SOLID SAMPLE
Sample Type         : Solid
Sample Geometry     : 1SMAR
Sample Quantity     :   968.000  gram
Sample Date/Time    :  3-12-96  11:06:00 AM
Acquire Start Date  :  3-17-96   1:48:28 PM
Detector Name       : LAB01
Elapsed Live Time   :   6000 seconds
Elapsed Real Time   :   6003 seconds

Comments:
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.09
TH-234	Not Detected	--------	4.77E-01
RA-226	1.42	4.95E-01	6.84E-01
PB-214	5.48E-01	9.37E-02	5.73E-02
BI-214	5.25E-01	9.10E-02	5.65E-02
TH-232	7.51E-01	3.66E-01	2.24E-01
RA-228	8.75E-01	3.04E-01	1.41E-01
AC-228	7.83E-01	1.51E-01	9.87E-02
TH-228	5.49E-01	3.75E-01	5.75E-01
RA-224	7.47E-01	1.98E-01	6.79E-02
PB-212	7.47E-01	1.29E-01	3.39E-02
BI-212	1.06	3.20E-01	3.91E-01
TL-208	6.28E-01	1.10E-01	7.61E-02
U-235	Not Detected	--------	1.51E-01
TH-231	Not Detected	--------	1.55
PA-231	Not Detected	--------	1.14
TH-227	Not Detected	--------	2.90E-01
RA-223	Not Detected	--------	1.41E-01
RN-219	Not Detected	--------	3.22E-01
PB-211	Not Detected	--------	7.14E-01
TL-207	Not Detected	--------	1.25E+01
AM-241	Not Detected	--------	1.50E-01
PU-239	Not Detected	--------	2.90E+02
NP-237	Not Detected	--------	2.19E-01
PA-233	Not Detected	--------	4.84E-02
TH-229	Not Detected	--------	1.72E-01

♀

[Summary Report] - Sample ID: 60019507

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.34E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.35E-02
BA-140	Not Detected	--------	1.28E-01
CD-109	Not Detected	--------	7.66E-01
CD-115	Not Detected	--------	2.75E-01
CE-139	Not Detected	--------	2.19E-02
CE-141	Not Detected	--------	3.79E-02
CE-144	Not Detected	--------	1.56E-01
CO-56	Not Detected	--------	3.38E-02
CO-57	Not Detected	--------	2.03E-02
CO-58	Not Detected	--------	2.97E-02
CO-60	Not Detected	--------	3.33E-02
CR-51	Not Detected	--------	2.08E-01
CS-134	Not Detected	--------	3.56E-02
CS-137	6.24E-02	2.11E-02	2.74E-02
CU-64	Not Detected	--------	5.69E+03
EU-152	Not Detected	--------	7.01E-02
EU-154	Not Detected	--------	1.64E-01
EU-155	Not Detected	--------	8.93E-02
FE-59	Not Detected	--------	7.43E-02
GD-153	Not Detected	--------	6.77E-02
HG-203	Not Detected	--------	2.59E-02
I-131	Not Detected	--------	3.62E-02
IN-115m	Not Detected	--------	1.09E+07
IR-192	Not Detected	--------	2.40E-02
K-40	1.71E+01	2.36	3.10E-01
LA-140	Not Detected	--------	2.76E-01
MN-52	Not Detected	--------	5.69E-02
MN-54	Not Detected	--------	3.19E-02
MN-56	Not Detected	--------	8.50E+12
MO-99	Not Detected	--------	8.48E-01
NA-22	Not Detected	--------	4.12E-02
NA-24	Not Detected	--------	9.42
NB-95	Not Detected	--------	3.01E-01
ND-147	Not Detected	--------	2.40E-01
NI-57	Not Detected	--------	4.85E-01
BE-07	Not Detected	--------	2.18E-01
RU-103	Not Detected	--------	2.68E-02
RU-106	Not Detected	--------	2.43E-01
SB-122	Not Detected	--------	1.28E-01
SB-124	Not Detected	--------	2.72E-02
SB-125	Not Detected	--------	7.08E-02
SC-46	Not Detected	--------	5.13E-02
SR-85	Not Detected	--------	3.31E-02
TA-182	Not Detected	--------	1.51E-01
TA-183	Not Detected	--------	2.57E-01
TE-132	Not Detected	--------	6.27E-02
TL-201	Not Detected	--------	2.06E-01
XE-133	Not Detected	--------	3.53E-01
Y-88	Not Detected	--------	2.24E-02
ZN-65	Not Detected	--------	9.59E-02
ZR-95	Not Detected	--------	5.37E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

3-17-96 5:18:39 PM

Dept. 7714

Reviewed by: AMM 3/19/96 Use Only - Survey No. _____

Customer : M.YOUNG (7585)
Customer Sample ID : 027907-02
Lab Sample ID : 60019508

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 1SMAR
Sample Quantity : 827.000 gram
Sample Date/Time : 3-12-96 11:10:00 AM
Acquire Start Date : 3-17-96 3:35:58 PM
Detector Name : LAB01
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.27
TH-234	Not Detected	--------	3.85E-01
RA-226	1.02	5.18E-01	7.75E-01
PB-214	6.60E-01	1.17E-01	8.37E-02
BI-214	5.94E-01	1.03E-01	6.17E-02
TH-232	9.02E-01	4.24E-01	1.92E-01
RA-228	8.97E-01	2.50E-01	1.46E-01
AC-228	9.65E-01	1.91E-01	1.40E-01
TH-228	Not Detected	--------	6.55E-01
RA-224	9.42E-01	2.50E-01	1.06E-01
PB-212	8.37E-01	1.44E-01	3.59E-02
BI-212	7.76E-01	2.52E-01	2.98E-01
TL-208	7.87E-01	1.37E-01	9.45E-02
U-235	Not Detected	--------	1.71E-01
TH-231	Not Detected	--------	1.75
PA-231	Not Detected	--------	1.28
TH-227	Not Detected	--------	3.31E-01
RA-223	Not Detected	--------	1.61E-01
RN-219	Not Detected	--------	3.44E-01
PB-211	Not Detected	--------	7.89E-01
TL-207	Not Detected	--------	1.43E+01
AM-241	Not Detected	--------	1.65E-01
PU-239	Not Detected	--------	3.22E+02
NP-237	Not Detected	--------	1.71E-01
PA-233	Not Detected	--------	5.46E-02
TH-229	Not Detected	--------	1.91E-01

♀

[Summary Report] - Sample ID: 60019508

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.52E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.72E-02
BA-140	Not Detected	--------	1.44E-01
CD-109	Not Detected	--------	8.53E-01
CD-115	Not Detected	--------	3.22E-01
CE-139	Not Detected	--------	2.45E-02
CE-141	Not Detected	--------	4.42E-02
CE-144	Not Detected	--------	1.70E-01
CO-56	Not Detected	--------	3.86E-02
CO-57	Not Detected	--------	2.18E-02
CO-58	Not Detected	--------	3.51E-02
CO-60	Not Detected	--------	3.69E-02
CR-51	Not Detected	--------	2.28E-01
CS-134	Not Detected	--------	4.12E-02
CS-137	3.38E-02	1.97E-02	2.92E-02
CU-64	Not Detected	--------	6.85E+03
EU-152	Not Detected	--------	7.74E-02
EU-154	Not Detected	--------	1.88E-01
EU-155	Not Detected	--------	9.60E-02
FE-59	Not Detected	--------	7.88E-02
GD-153	Not Detected	--------	7.55E-02
HG-203	Not Detected	--------	2.94E-02
I-131	Not Detected	--------	4.09E-02
IN-115m	Not Detected	--------	1.63E+07
IR-192	Not Detected	--------	2.57E-02
K-40	1.72E+01	2.38	3.86E-01
LA-140	Not Detected	--------	3.25E-01
MN-52	Not Detected	--------	5.86E-02
MN-54	Not Detected	--------	3.51E-02
MN-56	Not Detected	--------	1.54E+13
MO-99	Not Detected	--------	9.84E-01
NA-22	Not Detected	--------	4.57E-02
NA-24	Not Detected	--------	1.03E+01
NB-95	Not Detected	--------	3.51E-01
ND-147	Not Detected	--------	2.60E-01
NI-57	Not Detected	--------	5.35E-01
BE-07	Not Detected	--------	2.52E-01
RU-103	Not Detected	--------	2.86E-02
RU-106	Not Detected	--------	2.81E-01
SB-122	Not Detected	--------	1.56E-01
SB-124	Not Detected	--------	3.22E-02
SB-125	Not Detected	--------	8.07E-02
SC-46	Not Detected	--------	5.83E-02
SR-85	Not Detected	--------	3.80E-02
TA-182	Not Detected	--------	1.71E-01
TA-183	Not Detected	--------	2.86E-01
TE-132	Not Detected	--------	7.19E-02
TL-201	Not Detected	--------	2.34E-01
XE-133	Not Detected	--------	4.07E-01
Y-88	Not Detected	--------	2.96E-02
ZN-65	Not Detected	--------	1.13E-01
ZR-95	Not Detected	--------	6.15E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

3-17-96 7:06:10 PM

*Dept. 7714

* Reviewed by: ATM 3/19/96 *Use Only - Survey No.

Customer : M.YOUNG (7585)
Customer Sample ID : 027908-02
Lab Sample ID : 60019509

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 1SMAR
Sample Quantity : 829.000 gram
Sample Date/Time : 3-12-96 11:16:00 AM
Acquire Start Date : 3-17-96 5:23:25 PM
Detector Name : LAB01
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.26
TH-234	Not Detected	--------	5.21E-01
RA-226	1.43	4.72E-01	6.34E-01
PB-214	5.99E-01	1.28E-01	4.34E-02
BI-214	5.62E-01	1.01E-01	7.17E-02
TH-232	8.56E-01	4.05E-01	1.94E-01
RA-228	8.36E-01	2.08E-01	1.48E-01
AC-228	8.50E-01	1.67E-01	1.14E-01
TH-228	7.99E-01	4.31E-01	6.37E-01
RA-224	9.52E-01	2.51E-01	9.93E-02
PB-212	8.59E-01	1.68E-01	3.68E-02
BI-212	1.14	3.58E-01	4.46E-01
TL-208	7.86E-01	1.39E-01	1.03E-01
U-235	Not Detected	--------	1.72E-01
TH-231	Not Detected	--------	1.73
PA-231	Not Detected	--------	1.30
TH-227	Not Detected	--------	3.32E-01
RA-223	Not Detected	--------	1.59E-01
RN-219	~~2.07E-01~~	~~2.80E-01~~	~~3.60E-01~~
PB-211	Not Detected	--------	8.18E-01
TL-207	Not Detected	--------	1.36E+01
AM-241	Not Detected	--------	1.59E-01
PU-239	Not Detected	--------	3.25E+02
NP-237	Not Detected	--------	2.50E-01
PA-233	Not Detected	--------	5.30E-02
TH-229	Not Detected	--------	1.89E-01

ND mee 3/18/96

♀

[Summary Report] - Sample ID: 60019509

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.29E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.71E-02
BA-140	Not Detected	--------	1.39E-01
CD-109	Not Detected	--------	8.74E-01
CD-115	Not Detected	--------	3.38E-01
CE-139	Not Detected	--------	2.51E-02
CE-141	Not Detected	--------	4.36E-02
CE-144	Not Detected	--------	1.69E-01
CO-56	Not Detected	--------	3.77E-02
CO-57	Not Detected	--------	2.23E-02
CO-58	Not Detected	--------	3.44E-02
CO-60	Not Detected	--------	3.78E-02
CR-51	Not Detected	--------	2.32E-01
CS-134	Not Detected	--------	4.01E-02
CS-137	Not Detected	--------	3.61E-02
CU-64	Not Detected	--------	7.56E+03
EU-152	Not Detected	--------	8.06E-02
EU-154	Not Detected	--------	1.78E-01
EU-155	Not Detected	--------	9.45E-02
FE-59	Not Detected	--------	8.27E-02
GD-153	Not Detected	--------	7.38E-02
HG-203	Not Detected	--------	2.86E-02
I-131	Not Detected	--------	4.09E-02
IN-115m	Not Detected	--------	2.17E+07
IR-192	Not Detected	--------	2.60E-02
K-40	1.64E+01	2.27	3.66E-01
LA-140	Not Detected	--------	3.45E-01
MN-52	Not Detected	--------	5.59E-02
MN-54	Not Detected	--------	3.62E-02
MN-56	Not Detected	--------	2.37E+13
MO-99	Not Detected	--------	9.44E-01
NA-22	Not Detected	--------	4.44E-02
NA-24	Not Detected	--------	1.07E+01
NB-95	Not Detected	--------	3.57E-01
ND-147	Not Detected	--------	2.52E-01
NI-57	Not Detected	--------	5.64E-01
BE-07	Not Detected	--------	2.59E-01
RU-103	Not Detected	--------	2.97E-02
RU-106	Not Detected	--------	2.83E-01
SB-122	Not Detected	--------	1.55E-01
SB-124	Not Detected	--------	2.92E-02
SB-125	Not Detected	--------	7.87E-02
SC-46	Not Detected	--------	5.55E-02
SR-85	Not Detected	--------	3.77E-02
TA-182	Not Detected	--------	1.61E-01
TA-183	Not Detected	--------	2.78E-01
TE-132	Not Detected	--------	7.15E-02
TL-201	Not Detected	--------	2.43E-01
XE-133	Not Detected	--------	4.13E-01
Y-88	Not Detected	--------	2.76E-02
ZN-65	Not Detected	--------	1.04E-01
ZR-95	Not Detected	--------	6.39E-02

```
**********************************************************************
*                  Sandia National Laboratories                      *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]  *
*                      3-17-96  8:53:46 PM                           *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: DMM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer            : M.YOUNG (7585)
Customer Sample ID  : 027911-02
Lab Sample ID       : 60019510

Sample Description  : MARINELLI SOLID SAMPLE
Sample Type         : Solid
Sample Geometry     : 1SMAR
Sample Quantity     :   902.000  gram
Sample Date/Time    :  3-12-96  12:50:00 PM
Acquire Start Date  :  3-17-96   7:10:59 PM
Detector Name       : LAB01
Elapsed Live Time   :   6000 seconds
Elapsed Real Time   :   6003 seconds

Comments:
**********************************************************************
```

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.15
TH-234	7.04E-01	2.57E-01	3.62E-01
RA-226	1.05	5.12E-01	7.62E-01
PB-214	5.31E-01	9.59E-02	7.18E-02
BI-214	4.59E-01	8.46E-02	6.28E-02
TH-232	8.09E-01	3.83E-01	1.88E-01
RA-228	7.18E-01	2.28E-01	1.45E-01
AC-228	6.79E-01	1.43E-01	1.17E-01
TH-228	4.98E-01	3.38E-01	5.16E-01
RA-224	7.00E-01	1.93E-01	9.55E-02
PB-212	7.03E-01	1.22E-01	3.22E-02
BI-212	7.37E-01	3.11E-01	4.33E-01
TL-208	6.82E-01	1.17E-01	7.34E-02
U-235	Not Detected	--------	1.59E-01
TH-231	Not Detected	--------	1.63
PA-231	Not Detected	--------	1.15
TH-227	Not Detected	--------	2.99E-01
RA-223	Not Detected	--------	1.48E-01
RN-219	Not Detected	--------	3.16E-01
PB-211	Not Detected	--------	7.01E-01
TL-207	Not Detected	--------	1.25E+01
AM-241	Not Detected	--------	1.49E-01
PU-239	Not Detected	--------	3.00E+02
NP-237	Not Detected	--------	1.89E-01
PA-233	Not Detected	--------	5.04E-02
TH-229	Not Detected	--------	1.79E-01

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[Summary Report] - Sample ID: 60019510

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.42E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.41E-02
BA-140	Not Detected	--------	1.26E-01
CD-109	Not Detected	--------	7.88E-01
CD-115	Not Detected	--------	3.01E-01
CE-139	Not Detected	--------	2.23E-02
CE-141	Not Detected	--------	4.04E-02
CE-144	Not Detected	--------	1.56E-01
CO-56	Not Detected	--------	3.50E-02
CO-57	Not Detected	--------	2.09E-02
CO-58	Not Detected	--------	3.23E-02
CO-60	Not Detected	--------	3.49E-02
CR-51	Not Detected	--------	2.19E-01
CS-134	Not Detected	--------	3.67E-02
CS-137	5.20E-02	2.51E-02	3.66E-02
CU-64	Not Detected	--------	7.24E+03
EU-152	Not Detected	--------	7.15E-02
EU-154	Not Detected	--------	1.63E-01
EU-155	Not Detected	--------	8.88E-02
FE-59	Not Detected	--------	7.97E-02
GD-153	Not Detected	--------	6.97E-02
HG-203	Not Detected	--------	2.67E-02
I-131	Not Detected	--------	3.60E-02
IN-115m	Not Detected	--------	2.00E+07
IR-192	Not Detected	--------	2.42E-02
K-40	1.74E+01	2.40	3.45E-01
LA-140	Not Detected	--------	3.14E-01
MN-52	Not Detected	--------	5.55E-02
MN-54	Not Detected	--------	1.93E-02
MN-56	Not Detected	--------	2.34E+13
MO-99	Not Detected	--------	8.92E-01
NA-22	Not Detected	--------	4.04E-02
NA-24	Not Detected	--------	1.03E+01
NB-95	Not Detected	--------	3.23E-01
ND-147	Not Detected	--------	2.47E-01
NI-57	Not Detected	--------	5.23E-01
BE-07	Not Detected	--------	2.30E-01
RU-103	Not Detected	--------	2.59E-02
RU-106	Not Detected	--------	2.59E-01
SB-122	Not Detected	--------	1.42E-01
SB-124	Not Detected	--------	2.87E-02
SB-125	Not Detected	--------	6.84E-02
SC-46	Not Detected	--------	5.28E-02
SR-85	Not Detected	--------	3.46E-02
TA-182	Not Detected	--------	1.54E-01
TA-183	Not Detected	--------	2.61E-01
TE-132	Not Detected	--------	6.51E-02
TL-201	Not Detected	--------	2.18E-01
XE-133	Not Detected	--------	3.82E-01
Y-88	Not Detected	--------	2.69E-02
ZN-65	Not Detected	--------	1.00E-01
ZR-95	Not Detected	--------	5.71E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

3-17-96 10:41:22 PM

*Dept. 7714

Reviewed by: MJM 3/19/96 *Use Only - Survey No. _____

Customer : M.YOUNG (7585)
Customer Sample ID : 027912-02
Lab Sample ID : 60019511

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 1SMAR
Sample Quantity : 910.000 gram
Sample Date/Time : 3-12-96 12:57:00 PM
Acquire Start Date : 3-17-96 8:58:36 PM
Detector Name : LAB01
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.13
TH-234	7.82E-01	2.46E-01	3.60E-01
RA-226	1.24	4.82E-01	6.85E-01
PB-214	4.79E-01	8.56E-02	5.97E-02
BI-214	4.48E-01	8.16E-02	5.72E-02
TH-232	7.25E-01	3.38E-01	1.35E-01
RA-228	7.22E-01	1.87E-01	1.43E-01
AC-228	7.93E-01	1.63E-01	1.30E-01
TH-228	Not Detected	--------	6.18E-01
RA-224	8.49E-01	2.24E-01	8.63E-02
PB-212	7.44E-01	1.30E-01	3.23E-02
BI-212	7.78E-01	2.91E-01	3.86E-01
TL-208	6.69E-01	1.18E-01	8.20E-02
U-235	Not Detected	--------	1.58E-01
TH-231	Not Detected	--------	1.56
PA-231	Not Detected	--------	1.22
TH-227	Not Detected	--------	2.95E-01
RA-223	Not Detected	--------	1.46E-01
RN-219	Not Detected	--------	3.27E-01
PB-211	Not Detected	--------	7.51E-01
TL-207	Not Detected	--------	1.29E+01
AM-241	Not Detected	--------	1.50E-01
PU-239	Not Detected	--------	2.94E+02
NP-237	Not Detected	--------	1.70E-01
PA-233	Not Detected	--------	4.77E-02
TH-229	Not Detected	--------	1.76E-01

♀

[Summary Report] - Sample ID: 60019511

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.43E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.38E-02
BA-140	Not Detected	--------	1.31E-01
CD-109	Not Detected	--------	7.89E-01
CD-115	Not Detected	--------	3.09E-01
CE-139	Not Detected	--------	2.22E-02
CE-141	Not Detected	--------	4.01E-02
CE-144	Not Detected	--------	1.60E-01
CO-56	Not Detected	--------	3.33E-02
CO-57	Not Detected	--------	2.03E-02
CO-58	Not Detected	--------	3.20E-02
CO-60	Not Detected	--------	3.43E-02
CR-51	Not Detected	--------	2.15E-01
CS-134	Not Detected	--------	3.54E-02
CS-137	5.25E-02	2.72E-02	4.04E-02
CU-64	Not Detected	--------	7.43E+03
EU-152	Not Detected	--------	7.35E-02
EU-154	Not Detected	--------	1.65E-01
EU-155	Not Detected	--------	8.81E-02
FE-59	Not Detected	--------	7.62E-02
GD-153	Not Detected	--------	6.88E-02
HG-203	Not Detected	--------	2.70E-02
I-131	Not Detected	--------	3.70E-02
IN-115m	Not Detected	--------	2.60E+07
IR-192	Not Detected	--------	2.35E-02
K-40	1.81E+01	2.49	3.56E-01
LA-140	Not Detected	--------	2.98E-01
MN-52	Not Detected	--------	5.86E-02
MN-54	Not Detected	--------	3.38E-02
MN-56	Not Detected	--------	3.49E+13
MO-99	Not Detected	--------	9.30E-01
NA-22	Not Detected	--------	4.08E-02
NA-24	Not Detected	--------	1.15E+01
NB-95	Not Detected	--------	3.20E-01
ND-147	Not Detected	--------	2.39E-01
NI-57	Not Detected	--------	5.42E-01
BE-07	Not Detected	--------	2.25E-01
RU-103	Not Detected	--------	2.68E-02
RU-106	Not Detected	--------	2.68E-01
SB-122	Not Detected	--------	1.44E-01
SB-124	Not Detected	--------	2.82E-02
SB-125	Not Detected	--------	7.10E-02
SC-46	Not Detected	--------	5.47E-02
SR-85	Not Detected	--------	3.40E-02
TA-182	Not Detected	--------	1.58E-01
TA-183	Not Detected	--------	2.65E-01
TE-132	Not Detected	--------	6.63E-02
TL-201	Not Detected	--------	2.33E-01
XE-133	Not Detected	--------	3.79E-01
Y-88	Not Detected	--------	2.39E-02
ZN-65	Not Detected	--------	1.04E-01
ZR-95	Not Detected	--------	5.76E-02

```
**********************************************************************
*                  Sandia National Laboratories                      *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]  *
*                     3-18-96 12:28:57 AM                            *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: MMM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer           : M.YOUNG (7585)
Customer Sample ID : 027913-02
Lab Sample ID      : 60019512

Sample Description : MARINELLI SOLID SAMPLE
Sample Type        : Solid
Sample Geometry    : 1SMAR
Sample Quantity    :   859.000  gram
Sample Date/Time   :  3-12-96   1:03:00 PM
Acquire Start Date :  3-17-96  10:46:11 PM
Detector Name      : LAB01
Elapsed Live Time  :   6000 seconds
Elapsed Real Time  :   6003 seconds

Comments:
**********************************************************************
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.26
TH-234	1.16	3.13E-01	3.65E-01
RA-226	1.16	4.62E-01	6.58E-01
PB-214	5.93E-01	1.02E-01	6.37E-02
BI-214	5.84E-01	1.08E-01	8.48E-02
TH-232	8.41E-01	4.04E-01	2.24E-01
RA-228	8.27E-01	2.77E-01	1.55E-01
AC-228	9.12E-01	1.80E-01	1.31E-01
TH-228	4.46E-01	3.39E-01	5.23E-01
RA-224	8.88E-01	2.33E-01	7.66E-02
PB-212	8.30E-01	1.51E-01	3.72E-02
BI-212	9.46E-01	3.14E-01	3.96E-01
TL-208	7.51E-01	1.28E-01	7.82E-02
U-235	Not Detected	--------	1.66E-01
TH-231	Not Detected	--------	1.70
PA-231	Not Detected	--------	1.24
TH-227	Not Detected	--------	3.23E-01
RA-223	Not Detected	--------	1.59E-01
RN-219	Not Detected	--------	3.60E-01
PB-211	Not Detected	--------	7.80E-01
TL-207	Not Detected	--------	1.35E+01
AM-241	Not Detected	--------	1.61E-01
PU-239	Not Detected	--------	3.23E+02
NP-237	Not Detected	--------	1.80E-01
PA-233	Not Detected	--------	5.05E-02
TH-229	Not Detected	--------	1.88E-01

♀

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.29E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.73E-02
BA-140	Not Detected	--------	1.41E-01
CD-109	Not Detected	--------	8.34E-01
CD-115	Not Detected	--------	3.37E-01
CE-139	Not Detected	--------	2.35E-02
CE-141	Not Detected	--------	4.23E-02
CE-144	Not Detected	--------	1.64E-01
CO-56	Not Detected	--------	3.46E-02
CO-57	Not Detected	--------	2.15E-02
CO-58	Not Detected	--------	3.26E-02
CO-60	Not Detected	--------	3.91E-02
CR-51	Not Detected	--------	2.37E-01
CS-134	Not Detected	--------	3.94E-02
CS-137	3.37E-02	1.88E-02	2.76E-02
CU-64	Not Detected	--------	9.21E+03
EU-152	Not Detected	--------	7.68E-02
EU-154	Not Detected	--------	1.80E-01
EU-155	Not Detected	--------	9.49E-02
FE-59	Not Detected	--------	8.01E-02
GD-153	Not Detected	--------	7.25E-02
HG-203	Not Detected	--------	2.80E-02
I-131	Not Detected	--------	4.03E-02
IN-115m	Not Detected	--------	3.60E+07
IR-192	Not Detected	--------	2.56E-02
K-40	1.64E+01	2.28	3.43E-01
LA-140	Not Detected	--------	3.51E-01
MN-52	Not Detected	--------	5.46E-02
MN-54	Not Detected	--------	3.69E-02
MN-56	Not Detected	--------	5.72E+13
MO-99	Not Detected	--------	1.00
NA-22	Not Detected	--------	4.32E-02
NA-24	Not Detected	--------	1.36E+01
NB-95	Not Detected	--------	3.54E-01
ND-147	Not Detected	--------	2.63E-01
NI-57	Not Detected	--------	6.05E-01
BE-07	Not Detected	--------	2.51E-01
RU-103	Not Detected	--------	2.81E-02
RU-106	Not Detected	--------	2.70E-01
SB-122	Not Detected	--------	1.52E-01
SB-124	Not Detected	--------	2.96E-02
SB-125	Not Detected	--------	7.67E-02
SC-46	Not Detected	--------	5.58E-02
SR-85	Not Detected	--------	3.71E-02
TA-182	Not Detected	--------	1.62E-01
TA-183	Not Detected	--------	2.88E-01
TE-132	Not Detected	--------	7.30E-02
TL-201	Not Detected	--------	2.44E-01
XE-133	Not Detected	--------	4.19E-01
Y-88	Not Detected	--------	2.79E-02
ZN-65	Not Detected	--------	1.07E-01
ZR-95	Not Detected	--------	6.57E-02

```
**********************************************************************
*                    Sandia National Laboratories                    *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]*
*                      3-18-96  2:16:30 AM                           *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: AJM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer            : M.YOUNG (7585)
Customer Sample ID  : 027915-02
Lab Sample ID       : 60019513

Sample Description  : MARINELLI SOLID SAMPLE
Sample Type         : Solid
Sample Geometry     : 1SMAR
Sample Quantity     :   901.000  gram
Sample Date/Time    :  3-12-96   1:26:00 PM
Acquire Start Date  :  3-18-96  12:33:43 AM
Detector Name       : LAB01
Elapsed Live Time   :   6000 seconds
Elapsed Real Time   :   6003 seconds

Comments:
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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.17
TH-234	Not Detected	--------	4.77E-01
RA-226	1.22	4.92E-01	7.06E-01
PB-214	5.38E-01	9.73E-02	7.34E-02
BI-214	4.96E-01	8.70E-02	5.36E-02
TH-232	7.94E-01	3.85E-01	2.27E-01
RA-228	7.07E-01	2.62E-01	1.37E-01
AC-228	7.12E-01	1.48E-01	1.16E-01
TH-228	5.19E-01	3.43E-01	5.22E-01
RA-224	8.29E-01	2.22E-01	1.01E-01
PB-212	7.24E-01	1.26E-01	3.22E-02
BI-212	8.53E-01	3.07E-01	4.04E-01
TL-208	6.41E-01	1.20E-01	9.93E-02
U-235	5.67E-02	1.07E-01	1.57E-01
TH-231	Not Detected	--------	1.57
PA-231	Not Detected	--------	1.18
TH-227	Not Detected	--------	2.92E-01
RA-223	Not Detected	--------	1.47E-01
RN-219	Not Detected	--------	3.35E-01
PB-211	Not Detected	--------	7.35E-01
TL-207	Not Detected	--------	1.27E+01
AM-241	Not Detected	--------	1.47E-01
PU-239	Not Detected	--------	2.90E+02
NP-237	Not Detected	--------	2.21E-01
PA-233	Not Detected	--------	4.83E-02
TH-229	Not Detected	--------	1.78E-01

♀

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.27E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.40E-02
BA-140	Not Detected	--------	1.35E-01
CD-109	Not Detected	--------	7.71E-01
CD-115	Not Detected	--------	3.30E-01
CE-139	Not Detected	--------	2.23E-02
CE-141	Not Detected	--------	3.95E-02
CE-144	Not Detected	--------	1.54E-01
CO-56	Not Detected	--------	3.18E-02
CO-57	Not Detected	--------	2.07E-02
CO-58	Not Detected	--------	3.21E-02
CO-60	Not Detected	--------	3.65E-02
CR-51	Not Detected	--------	2.07E-01
CS-134	Not Detected	--------	3.70E-02
CS-137	4.03E-02	1.86E-02	2.63E-02
CU-64	Not Detected	--------	9.27E+03
EU-152	Not Detected	--------	7.25E-02
EU-154	Not Detected	--------	1.65E-01
EU-155	Not Detected	--------	8.83E-02
FE-59	Not Detected	--------	7.50E-02
GD-153	Not Detected	--------	6.97E-02
HG-203	Not Detected	--------	2.64E-02
I-131	Not Detected	--------	3.64E-02
IN-115m	Not Detected	--------	4.31E+07
IR-192	Not Detected	--------	2.37E-02
K-40	1.74E+01	2.40	3.21E-01
LA-140	Not Detected	--------	3.51E-01
MN-52	Not Detected	--------	5.48E-02
MN-54	Not Detected	--------	3.26E-02
MN-56	Not Detected	--------	7.68E+13
MO-99	Not Detected	--------	9.86E-01
NA-22	Not Detected	--------	4.07E-02
NA-24	Not Detected	--------	1.31E+01
NB-95	~~6.79E-02~~	~~5.13E-02~~	~~1.38E-01~~ N.D. JGM 3/19/96
ND-147	Not Detected	--------	2.44E-01
NI-57	Not Detected	--------	5.68E-01
BE-07	Not Detected	--------	2.23E-01
RU-103	Not Detected	--------	2.67E-02
RU-106	Not Detected	--------	2.52E-01
SB-122	Not Detected	--------	1.59E-01
SB-124	Not Detected	--------	2.90E-02
SB-125	Not Detected	--------	6.72E-02
SC-46	Not Detected	--------	5.17E-02
SR-85	Not Detected	--------	3.55E-02
TA-182	Not Detected	--------	1.47E-01
TA-183	Not Detected	--------	2.65E-01
TE-132	Not Detected	--------	6.76E-02
TL-201	Not Detected	--------	2.33E-01
XE-133	Not Detected	--------	4.02E-01
Y-88	Not Detected	--------	2.57E-02
ZN-65	Not Detected	--------	9.88E-02
ZR-95	Not Detected	--------	5.99E-02

```
**********************************************************************
*                    Sandia National Laboratories                    *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]*
*                      3-18-96  4:03:59 AM                           *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: RJM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer            : M.YOUNG (7585)
Customer Sample ID  : 027918-02
Lab Sample ID       : 60019514

Sample Description  : MARINELLI SOLID SAMPLE
Sample Type         : Solid
Sample Geometry     : 1SMAR
Sample Quantity     :   900.000  gram
Sample Date/Time    :  3-12-96   1:38:00 PM
Acquire Start Date  :  3-18-96   2:21:16 AM
Detector Name       : LAB01
Elapsed Live Time   :   6000 seconds
Elapsed Real Time   :   6003 seconds

Comments:
**********************************************************************
```

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.20
TH-234	6.73E-01	2.44E-01	3.57E-01
RA-226	1.55	4.53E-01	5.79E-01
PB-214	5.85E-01	1.09E-01	8.97E-02
BI-214	5.08E-01	9.47E-02	7.52E-02
TH-232	7.86E-01	3.64E-01	1.35E-01
RA-228	8.98E-01	2.81E-01	1.51E-01
AC-228	8.23E-01	1.63E-01	1.17E-01
TH-228	5.39E-01	3.96E-01	6.11E-01
RA-224	8.25E-01	2.23E-01	1.10E-01
PB-212	8.31E-01	1.42E-01	3.42E-02
BI-212	8.79E-01	3.09E-01	4.03E-01
TL-208	7.23E-01	1.28E-01	9.42E-02
U-235	Not Detected	--------	1.60E-01
TH-231	Not Detected	--------	1.67
PA-231	Not Detected	--------	1.24
TH-227	Not Detected	--------	3.11E-01
RA-223	Not Detected	--------	1.60E-01
RN-219	Not Detected	--------	3.44E-01
PB-211	Not Detected	--------	7.80E-01
TL-207	Not Detected	--------	1.32E+01
AM-241	Not Detected	--------	1.58E-01
PU-239	Not Detected	--------	3.09E+02
NP-237	Not Detected	--------	1.76E-01
PA-233	Not Detected	--------	4.97E-02
TH-229	Not Detected	--------	1.84E-01

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Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.49E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	3.64E-02
BA-140	Not Detected	--------	1.35E-01
CD-109	Not Detected	--------	8.23E-01
CD-115	Not Detected	--------	3.34E-01
CE-139	Not Detected	--------	2.35E-02
CE-141	Not Detected	--------	4.11E-02
CE-144	Not Detected	--------	1.62E-01
CO-56	Not Detected	--------	3.55E-02
CO-57	Not Detected	--------	2.15E-02
CO-58	Not Detected	--------	3.15E-02
CO-60	Not Detected	--------	3.65E-02
CR-51	Not Detected	--------	2.18E-01
CS-134	Not Detected	--------	3.84E-02
CS-137	7.26E-02	2.56E-02	3.43E-02
CU-64	Not Detected	--------	1.10E+04
EU-152	Not Detected	--------	7.41E-02
EU-154	Not Detected	--------	1.65E-01
EU-155	Not Detected	--------	9.08E-02
FE-59	Not Detected	--------	7.78E-02
GD-153	Not Detected	--------	7.03E-02
HG-203	Not Detected	--------	2.75E-02
I-131	Not Detected	--------	3.86E-02
IN-115m	Not Detected	--------	5.47E+07
IR-192	Not Detected	--------	2.47E-02
K-40	1.67E+01	2.31	2.97E-01
LA-140	Not Detected	--------	3.46E-01
MN-52	Not Detected	--------	6.33E-02
MN-54	Not Detected	--------	3.37E-02
MN-56	Not Detected	--------	1.32E+14
MO-99	Not Detected	--------	1.01
NA-22	Not Detected	--------	3.96E-02
NA-24	Not Detected	--------	1.45E+01
NB-95	Not Detected	--------	3.50E-01
ND-147	Not Detected	--------	2.59E-01
NI-57	Not Detected	--------	5.57E-01
BE-07	Not Detected	--------	2.46E-01
RU-103	Not Detected	--------	2.81E-02
RU-106	Not Detected	--------	2.63E-01
SB-122	Not Detected	--------	1.57E-01
SB-124	Not Detected	--------	2.97E-02
SB-125	Not Detected	--------	7.63E-02
SC-46	Not Detected	--------	5.27E-02
SR-85	Not Detected	--------	3.62E-02
TA-182	Not Detected	--------	1.53E-01
TA-183	Not Detected	--------	2.86E-01
TE-132	Not Detected	--------	7.07E-02
TL-201	Not Detected	--------	2.43E-01
XE-133	Not Detected	--------	4.28E-01
Y-88	Not Detected	--------	2.87E-02
ZN-65	Not Detected	--------	1.02E-01
ZR-95	Not Detected	--------	6.25E-02

```
**********************************************************************
*                    Sandia National Laboratories                    *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]*
*                      3-18-96  5:50:38 AM                           *
**********************************************************************
*                                        *Dept. 7714                 *
* Reviewed by: DMM 3/19/96               *Use Only - Survey No._____ *
**********************************************************************

Customer            : M.YOUNG (7585)
Customer Sample ID  : 028060-12
Lab Sample ID       : 60019515

Sample Description  : MARINELLI LIQUID SAMPLE
Sample Type         : Liquid
Sample Geometry     : 1WMAR
Sample Quantity     :   500.000  mL
Sample Date/Time    :  3-12-96   1:45:00 PM
Acquire Start Date  :  3-18-96   4:08:49 AM
Detector Name       : LAB01
Elapsed Live Time   :   6000 seconds
Elapsed Real Time   :   6001 seconds

Comments:
**********************************************************************
```

Nuclide	Activity (pCi/mL)	2S Error	MDA
U-238	Not Detected	--------	3.60E-01
TH-234	Not Detected	--------	1.95E-01
RA-226	Not Detected	--------	2.80E-01
PB-214	Not Detected	--------	2.78E-02
BI-214	Not Detected	--------	3.06E-02
TH-232	Not Detected	--------	9.16E-02
RA-228	Not Detected	--------	8.66E-02
AC-228	Not Detected	--------	5.52E-02
TH-228	Not Detected	--------	2.88E-01
RA-224	Not Detected	--------	7.42E-02
PB-212	Not Detected	--------	2.46E-02
BI-212	Not Detected	--------	2.18E-01
TL-208	Not Detected	--------	4.13E-02
U-235	Not Detected	--------	8.57E-02
TH-231	Not Detected	--------	5.73E-01
PA-231	Not Detected	--------	6.23E-01
TH-227	Not Detected	--------	9.16E-02
RA-223	Not Detected	--------	5.50E-02
RN-219	Not Detected	--------	1.59E-01
PB-211	Not Detected	--------	3.64E-01
TL-207	Not Detected	--------	6.12
AM-241	Not Detected	--------	4.23E-02
PU-239	Not Detected	--------	1.52E+02
NP-237	Not Detected	--------	7.42E-02
PA-233	Not Detected	--------	2.46E-02
TH-229	Not Detected	--------	8.33E-02

♀

Nuclide	Activity (pCi/mL)	2S Error	MDA
AG-110m	Not Detected	--------	1.48E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	1.64E-02
BA-140	Not Detected	--------	6.06E-02
CD-109	Not Detected	--------	2.59E-01
CD-115	Not Detected	--------	1.34E-01
CE-139	Not Detected	--------	1.25E-02
CE-141	Not Detected	--------	2.21E-02
CE-144	Not Detected	--------	8.37E-02
CO-56	Not Detected	--------	1.95E-02
CO-57	Not Detected	--------	1.14E-02
CO-58	Not Detected	--------	1.34E-02
CO-60	Not Detected	--------	1.57E-02
CR-51	Not Detected	--------	1.18E-01
CS-134	Not Detected	--------	1.47E-02
CS-137	Not Detected	--------	1.50E-02
CU-64	Not Detected	--------	5.28E+03
EU-152	Not Detected	--------	3.61E-02
EU-154	Not Detected	--------	7.06E-02
EU-155	Not Detected	--------	4.55E-02
FE-59	Not Detected	--------	3.09E-02
GD-153	Not Detected	--------	3.15E-02
HG-203	Not Detected	--------	1.40E-02
I-131	Not Detected	--------	1.76E-02
IN-115m	Not Detected	--------	2.77E+07
IR-192	Not Detected	--------	1.21E-02
K-40	Not Detected	--------	1.98E-01
LA-140	Not Detected	--------	2.05E-01
MN-52	Not Detected	--------	3.77E-02
MN-54	Not Detected	--------	1.58E-02
MN-56	Not Detected	--------	1.13E+14
MO-99	Not Detected	--------	5.00E-01
NA-22	Not Detected	--------	1.51E-02
NA-24	Not Detected	--------	7.90
NB-95	Not Detected	--------	1.21E-01
ND-147	Not Detected	--------	1.24E-01
NI-57	Not Detected	--------	2.48E-01
BE-07	Not Detected	--------	1.23E-01
RU-103	Not Detected	--------	1.44E-02
RU-106	Not Detected	--------	1.38E-01
SB-122	Not Detected	--------	7.02E-02
SB-124	Not Detected	--------	1.52E-02
SB-125	Not Detected	--------	3.95E-02
SC-46	Not Detected	--------	1.56E-02
SR-85	Not Detected	--------	2.00E-02
TA-182	Not Detected	--------	4.52E-02
TA-183	Not Detected	--------	7.80E-02
TE-132	Not Detected	--------	3.43E-02
TL-201	Not Detected	--------	7.06E-02
XE-133	Not Detected	--------	1.47E-01
Y-88	Not Detected	--------	2.10E-02
ZN-65	Not Detected	--------	3.70E-02
ZR-95	Not Detected	--------	2.56E-02

Feature 58H

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab Batch No. _____ ER Site 58H

AR/COC- 04924

SF 2001-COC (6-95)

Dept. No./Mail Stop: 7585/1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No: _____
Service Order No.: CF 0180

Date Samples Shipped: 3-14-96
Carrier/Waybill No.: 43-9891
Lab Contact: EDIE KENT
Lab Destination: SEL
SMO Contact/Phone: Doug Salmi/848-0963
Send Report to SMO: Deborah McLaughlin

Contract No.: AL2480A
Case No.: 8835.110
SMO Authorization: [signature]
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Location Tech Area III
Building _____ Room _____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Metals (6010/7000 for TAL)	Isotopic Uranium	Thorium	Cesium 137	Lab Sample ID
027924-06	58H-GR-004-0.0-SS0	0.0	58H	3-13-96 1225	Soil	AG	250ml	NONE 4°C	G	SA	X				.1
027924-08	58H-GR-004-0.0-SS0	"	"	1225	"	"	"	"	"	"		X	X	X	.2
027929-06	58H-GR-008-0.0-SS0	"	"	1248	"	"	"	"	"	"	X				.1
027929-08	58H-GR-008-0.0-SS0	"	"	1248	"	"	"	"	"	"		X	X	X	.2
027934-06	58H-GR-012-0.0-SS0	"	"	1318	"	"	"	"	"	"	X				.1
027934-08	58H-GR-012-0.0-SS0	"	"	1318	"	"	"	"	"	"		X	X	X	.2
027971-06	58H-GR-016-0.0-SS0	"	"	1345	"	"	"	"	"	"	X				.1
027972-06	58H-GR-016-0.0-SSDO	"	"	1345	" DUP	"	"	"	"	DU	X				.11
027971-08	58H-GR-016-0.0-SS0	"	"	1345	"	"	"	"	"	SA		X	X	X	.2
027972-08	58H-GR-016-0.0-SSDO	"	"	1345	" DUP	"	"	"	"	DU		X	X	X	.12

Reference LOV (available at SMO)

Parameter & Method Requested

RMMA ☑ Yes ☐ No Ref. No. _____

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☑ Normal ☐ Rush Required Report Date _____

Sample Tracking — Date Entered (mo/dd/yy) _____ Entered by _____ QC Info _____

Special Instructions/QC Requirements
- Send report to Mike Young (1148ms)

List As Separate Report

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciato	Concetta Cacciato	CC	Lamb/7584/284-3301
	Rod Nagel	Rod Nagel	RN	IT/7584
	Gilbert L. Quintana	Gilbert L. Quintana	GLQ	IT/7584

	Org.	Date	Time		Org.	Date	Time
1. Relinquished by Rod Nagel	IT/7584	3/14/96	0930	4. Relinquished by			
1. Received by [signature]	7513	3/14/96	0938	4. Received by			
2. Relinquished by [signature]	7513	3/18/96	1480	5. Relinquished by			
2. Received by Doug Durand	CER	3/19/96	0900	5. Received by			
3. Relinquished by				6. Relinquished by			
3. Received by				6. Receivec by			

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

SF 2001-COD (9-94) ER Site 58H

ANALYSIS REQUEST AND CHAIN OF CUSTOD

AR/COC- 04924

Project Name: Foothills Test Area Project/Task Manager: Mike Young Case No.: 8835.110

Location Tech Area III Building ____ Room ____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Metals (6010/7000) for TAL	Isotopic Uranium	Iso Thorium	Cesium 137	Gamma Spec.	Lab Sample ID
027974-16	58H-GR-018-0.0-EB	–	58H	3-23-96 1415	Water	Poly	500ml	HNO_3	G	EB	X					.3
027974-18	58H-GR-018-0.0-EB	–	58H	" 1415	Water	Poly	1 Liter	HNO_3	G	EB		X				.4
027974-19	58H-GR-018-0.0-EB	–	58H	" 1415	Water	Poly	1 Liter	HNO_3	G	EB			X			.5
027974-20	58H-GR-018-0.0-EB	–	58H	↓ 1415	Water	Poly	2½ Liter	HNO_3	G	EB				X	X	.6
						EB										LAB USE

Abnormal Conditions on Receipt LAB USE

Recipient Initials

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027924-08 58H-GR-004-0.0-SSO
Lab ID : 9603314-02
Matrix : SOIL
Date Collected : 03/13/96
Date Received : 03/19/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		0.964	+/- 0.121	.04	0.0524	pCi/g	1.0	TLN	04/09/96	1954	82082	1
Thorium-230	B	0.797	+/- 0.105	.04	0.0286	pCi/g	1.0					
Thorium-232	B	0.876	+/- 0.111	.04	0.0248	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.558	+/- 0.0901	.09	0.0290	pCi/g	1.0	PEM	04/10/96	1739	82081	2
Uranium-235	UB	0.0363	+/- 0.0224	.09	0.0232	pCi/g	1.0					
Uranium-238	B	0.572	+/- 0.0909	.09	0.0190	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228	U	0.914	+/- 0.239	1	0.127	pCi/g	1.0	SCM	04/03/96	1955	82046	1
Americium-241	U	-0.0263	+/- 0.0861	2	0.135	pCi/g	1.0					
Cerium-144	U	0.0293	+/- 0.144	.5	0.181	pCi/g	1.0					
Cesium-134	U	0.000412	+/- 0.0192	.1	0.0294	pCi/g	1.0					
Cesium-137		0.128	+/- 0.0402	.04	0.0353	pCi/g	1.0					
Chromium-51	U	0.0932	+/- 0.226	1	0.383	pCi/g	1.0					
Cobalt-60	U	0.00634	+/- 0.0205	.1	0.0380	pCi/g	1.0					
Iron-59	U	-0.0562	+/- 0.0676	1	0.0947	pCi/g	1.0					
Lead-212		1.12	+/- 0.172	1	0.0490	pCi/g	1.0					
Lead-214	U	0.900	+/- 0.158	1	0.0571	pCi/g	1.0					
Potassium-40		20.6	+/- 2.75	1	0.348	pCi/g	1.0					
Radium-226	U	0.792	+/- 0.135	1	0.0590	pCi/g	1.0					
Radium-228	U	0.914	+/- 0.239	1	0.127	pCi/g	1.0					
Ruthenium-103	U	0.00463	+/- 0.021	1	0.0376	pCi/g	1.0					
Ruthenium-106	U	-0.0780	+/- 0.164	.8	0.275	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.182	pCi/g	1.0					
Thorium-232	U	1.10	+/- 0.168	2	0.0480	pCi/g	1.0					
Thorium-234	UB	0.998	+/- 1.31	5	1.09	pCi/g	1.0					
Uranium-235	U	0.131	+/- 0.11	1	0.189	pCi/g	1.0					

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027924-08 58H-GR-004-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.998	+/- 1.31	5	1.09	pCi/g	1.0					
Zirconium-95	U	0.0333	+/- 0.0543	1	0.0720	pCi/g	1.0	SCM	04/03/96	1955	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027924-08 58H-GR-004-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID	: 027929-08 58H-GR-008-0.0-SSO
Lab ID	: 9603314-04
Matrix	: SOIL
Date Collected	: 03/13/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		0.813	+/- 0.159	.04	0.124	pCi/g	1.0	TLN	04/08/96	2211	82082	1
Thorium-230	B	0.714	+/- 0.138	.04	0.0592	pCi/g	1.0					
Thorium-232	B	0.851	+/- 0.152	.04	0.0336	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.475	+/- 0.079	.09	0.0210	pCi/g	1.0	PEM	04/10/96	1739	82081	2
Uranium-235	UB	0.0123	+/- 0.0143	.09	0.0239	pCi/g	1.0					
Uranium-238	B	0.571	+/- 0.0882	.09	0.0262	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228	U	0.808	+/- 0.154	1	0.102	pCi/g	1.0	SCM	04/03/96	1959	82046	1
Americium-241	U	-0.0788	+/- 0.0824	2	0.127	pCi/g	1.0					
Cerium-144	U	-0.0471	+/- 0.0968	.5	0.165	pCi/g	1.0					
Cesium-134	U	-0.00680	+/- 0.0173	.1	0.0298	pCi/g	1.0					
Cesium-137		0.278	+/- 0.0473	.04	0.0355	pCi/g	1.0					
Chromium-51	U	0.166	+/- 0.3	1	0.357	pCi/g	1.0					
Cobalt-60	U	-0.00158	+/- 0.0182	.1	0.0334	pCi/g	1.0					
Iron-59	U	0.00786	+/- 0.0479	1	0.0847	pCi/g	1.0					
Lead-212	U	0.896	+/- 0.0615	1	0.0440	pCi/g	1.0					
Lead-214	U	0.732	+/- 0.0837	1	0.0568	pCi/g	1.0					
Potassium-40		17.4	+/- 0.988	1	0.282	pCi/g	1.0					
Radium-226	U	0.590	+/- 0.0918	1	0.0664	pCi/g	1.0					
Radium-228	U	0.808	+/- 0.154	1	0.102	pCi/g	1.0					
Ruthenium-103	U	-0.00937	+/- 0.0216	1	0.0378	pCi/g	1.0					
Ruthenium-106	U	-0.0434	+/- 0.158	.8	0.277	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.179	pCi/g	1.0					
Thorium-232	U	0.877	+/- 0.0602	2	0.0431	pCi/g	1.0					
Thorium-234	UB	0.851	+/- 0.838	5	1.09	pCi/g	1.0					
Uranium-235	U	0.0324	+/- 0.193	1	0.170	pCi/g	1.0					

40

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027929-08 58H-GR-008-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.851	+/- 0.838	5	1.09	pCi/g	1.0					
Zirconium-95	U	0.0312	+/- 0.0393	1	0.0732	pCi/g	1.0	SCM	04/03/96	1959	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089.	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027929-08 58H-GR-008-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: April 15, 1996

Sample ID	: 027934-08 58H-GR-012-0.0-SSO
Lab ID	: 9603314-06
Matrix	: SOIL
Date Collected	: 03/13/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.08	+/- 0.155	.04	0.0811	pCi/g	1.0	TLN	04/09/96	1954	82082	1
Thorium-230	B	0.962	+/- 0.137	.04	0.0111	pCi/g	1.0					
Thorium-232	B	0.999	+/- 0.141	.04	0.0111	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.535	+/- 0.0903	.09	0.0277	pCi/g	1.0	PEM	04/10/96	1739	82081	2
Uranium-235	UB	0.0207	+/- 0.0189	.09	0.0278	pCi/g	1.0					
Uranium-238	B	0.430	+/- 0.0795	.09	0.0200	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228	U	0.627	+/- 0.163	1	0.0696	pCi/g	1.0	SCM	04/04/96	1420	82046	1
Americium-241	U	0.0592	+/- 0.0729	2	0.0819	pCi/g	1.0					
Cerium-144	U	0.0192	+/- 0.0843	.5	0.131	pCi/g	1.0					
Cesium-134	U	-0.0170	+/- 0.0124	.1	0.0197	pCi/g	1.0					
Cesium-137	U	0.0108	+/- 0.0161	.04	0.0189	pCi/g	1.0					
Chromium-51	U	0.00230	+/- 0.152	1	0.252	pCi/g	1.0					
Cobalt-60	U	0.00904	+/- 0.0131	.1	0.0247	pCi/g	1.0					
Iron-59	U	0.0189	+/- 0.0333	1	0.0615	pCi/g	1.0					
Lead-212	U	0.617	+/- 0.091	1	0.0345	pCi/g	1.0					
Lead-214	U	0.579	+/- 0.106	1	0.0369	pCi/g	1.0					
Potassium-40		12.3	+/- 1.71	1	0.203	pCi/g	1.0					
Radium-226	U	0.469	+/- 0.0834	1	0.0433	pCi/g	1.0					
Radium-228	U	0.627	+/- 0.163	1	0.0696	pCi/g	1.0					
Ruthenium-103	U	0.00291	+/- 0.0144	1	0.0255	pCi/g	1.0					
Ruthenium-106	U	0.0356	+/- 0.102	.8	0.181	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.132	pCi/g	1.0					
Thorium-232	U	0.603	+/- 0.089	2	0.0338	pCi/g	1.0					
Thorium-234	UB	0.810	+/- 0.708	5	0.653	pCi/g	1.0					
Uranium-235	U	0.0689	+/- 0.0794	1	0.138	pCi/g	1.0					

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027934-08 58H-GR-012-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.810	+/- 0.708	5	0.653	pCi/g	1.0					
Zirconium-95	U	0.0109	+/- 0.0262	1	0.0460	pCi/g	1.0	SCM	04/04/96	1420	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027934-08 58H-GR-012-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID	: 027971-08 58H-GR-016-0.0-SSO
Lab ID	: 9603314-09
Matrix	: SOIL
Date Collected	: 03/13/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		0.982	+/- 0.21	.04	0.164	pCi/g	1.0	TLN	04/08/96	2123	82082	1
Thorium-230	B	0.767	+/- 0.17	.04	0.0716	pCi/g	1.0					
Thorium-232	B	0.897	+/- 0.185	.04	0.0470	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.530	+/- 0.0869	.09	0.0341	pCi/g	1.0	PEM	04/10/96	1739	82081	2
Uranium-235	UB	0.0233	+/- 0.018	.09	0.0223	pCi/g	1.0					
Uranium-238	B	0.507	+/- 0.0847	.09	0.0341	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228		1.08	+/- 0.241	1	0.0738	pCi/g	1.0	SCM	04/04/96	0727	82046	1
Americium-241	U	0.0138	+/- 0.0531	2	0.0847	pCi/g	1.0					
Cerium-144	U	0.00328	+/- 0.0836	.5	0.143	pCi/g	1.0					
Cesium-134	U	0.00379	+/- 0.0126	.1	0.0195	pCi/g	1.0					
Cesium-137	U	0.00676	+/- 0.0128	.04	0.0226	pCi/g	1.0					
Chromium-51	U	0.00524	+/- 0.182	1	0.268	pCi/g	1.0					
Cobalt-60	U	0.000505	+/- 0.0117	.1	0.0210	pCi/g	1.0					
Iron-59	U	-0.00806	+/- 0.0342	1	0.0596	pCi/g	1.0					
Lead-212	U	0.994	+/- 0.138	1	0.0405	pCi/g	1.0					
Lead-214	U	0.859	+/- 0.136	1	0.0390	pCi/g	1.0					
Potassium-40		19.6	+/- 2.63	1	0.221	pCi/g	1.0					
Radium-226	U	0.605	+/- 0.0966	1	0.0388	pCi/g	1.0					
Radium-228		1.08	+/- 0.241	1	0.0738	pCi/g	1.0					
Ruthenium-103	U	0.0208	+/- 0.0147	1	0.0268	pCi/g	1.0					
Ruthenium-106	U	-0.0961	+/- 0.109	.8	0.177	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.132	pCi/g	1.0					
Thorium-232	U	0.973	+/- 0.135	2	0.0396	pCi/g	1.0					
Thorium-234	UB	0.665	+/- 0.785	5	0.688	pCi/g	1.0					
Uranium-235	U	0.147	+/- 0.0887	1	0.151	pCi/g	1.0					

46

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Client: Sandia National Laboratories
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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027971-08 58H-GR-016-0.0-SSO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.665	+/- 0.785	5	0.688	pCi/g	1.0					
Zirconium-95	U	0.0205	+/- 0.0262	1	0.0465	pCi/g	1.0	SCM	04/04/96	0727	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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Client: Sandia National Laboratories
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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027971-08 58H-GR-016-0.0-SSO

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: April 15, 1996

Sample ID : 027972-08 58H-GR-016-0.0-SSDO
Lab ID : 9603314-10
Matrix : SOIL
Date Collected : 03/13/96
Date Received : 03/19/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		0.966	+/- 0.243	.04	0.204	pCi/g	1.0	TLN	04/08/96	2123	82082	1
Thorium-230	B	0.794	+/- 0.198	.04	0.0305	pCi/g	1.0					
Thorium-232	B	1.03	+/- 0.233	.04	0.0781	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.652	+/- 0.0966	.09	0.0217	pCi/g	1.0	PEM	04/10/96	1739	82081	2
Uranium-235	UB	0.0538	+/- 0.0249	.09	0.00849	pCi/g	1.0					
Uranium-238	B	0.581	+/- 0.09	.09	0.00847	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228	U	0.957	+/- 0.206	1	0.0769	pCi/g	1.0	SCM	04/04/96	2044	82046	1
Americium-241	U	-0.0166	+/- 0.0463	2	0.0803	pCi/g	1.0					
Cerium-144	U	-0.0392	+/- 0.0839	.5	0.141	pCi/g	1.0					
Cesium-134	U	-0.00466	+/- 0.0125	.1	0.0184	pCi/g	1.0					
Cesium-137	U	0.0117	+/- 0.0177	.04	0.0189	pCi/g	1.0					
Chromium-51	U	0.0333	+/- 0.157	1	0.261	pCi/g	1.0					
Cobalt-60	U	-0.00561	+/- 0.0133	.1	0.0227	pCi/g	1.0					
Iron-59	U	-0.0186	+/- 0.041	1	0.0603	pCi/g	1.0					
Lead-212	U	0.976	+/- 0.136	1	0.0406	pCi/g	1.0					
Lead-214	U	0.746	+/- 0.125	1	0.0394	pCi/g	1.0					
Potassium-40		18.3	+/- 2.47	1	0.196	pCi/g	1.0					
Radium-226	U	0.630	+/- 0.102	1	0.0365	pCi/g	1.0					
Radium-228	U	0.957	+/- 0.206	1	0.0769	pCi/g	1.0					
Ruthenium-103	U	0.00640	+/- 0.0143	1	0.0254	pCi/g	1.0					
Ruthenium-106	U	-0.0474	+/- 0.106	.8	0.177	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.131	pCi/g	1.0					
Thorium-232	U	0.955	+/- 0.133	2	0.0397	pCi/g	1.0					
Thorium-234	UB	0.904	+/- 0.869	5	0.689	pCi/g	1.0					
Uranium-235	U	0.0806	+/- 0.0831	1	0.143	pCi/g	1.0					

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027972-08 58H-GR-016-0.0-SSDO

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.904	+/- 0.869	5	0.689	pCi/g	1.0					
Zirconium-95	U	-0.00507	+/- 0.0269	1	0.0452	pCi/g	1.0	SCM	04/04/96	2044	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027972-08 58H-GR-016-0.0-SSDO

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 09, 1996

Sample ID	: 027974-18 58H-GR-018-0.0-EB
Lab ID	: 9603314-12
Matrix	: AQUEOUS
Date Collected	: 03/13/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234		1.09	+/- 0.204	.15	0.0825	pCi/L	1.0	ADW	04/05/96	1159	82697	1
Uranium-235	U	0.00781	+/- 0.032	.15	0.0766	pCi/L	1.0					
Uranium-238	UB	0.0834	+/- 0.0536	.15	0.0501	pCi/L	1.0					

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	EPI A-011

GEL Laboratory Certifications **EPI Laboratory Certifications**

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CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 09, 1996

Sample ID : 027974-18 58H-GR-018-0.0-EB

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 18, 1996

Sample ID	: 027974-19 58H-GR-018-0.0-EB
Lab ID	: 9603314-13
Matrix	: AQUEOUS
Date Collected	: 03/13/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228	U	-0.00114	+/- 0.0872	.15	0.246	pCi/L	1.0	PCW	04/17/96	0822	82936	1
Thorium-230	U	0.0278	+/- 0.0507	.15	0.106	pCi/L	1.0					
Thorium-232	U	0.0405	+/- 0.0622	.15	0.122	pCi/L	1.0					

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	EPI A-012

GEL Laboratory Certifications **EPI Laboratory Certifications**

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GENERAL ENGINEERING LABORATORIES

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 18, 1996

Sample ID : 027974-19 58H-GR-018-0.0-EB

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

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GENERAL ENGINEERING LABORATORIES

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: April 02, 1996

Sample ID	: 027974-20 58H-GR-018-0.0-EB
Lab ID	: 9603314-14
Matrix	: AQUEOUS
Date Collected	: 03/13/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Gamma PHA - 21 items												
Actinium-228	U	4.91	+/- 8.52	30	15.8	pCi/L	1.0	SCM	03/29/96	1229	82448	1
Americium-241	U	6.40	+/- 10.2	100	17.8	pCi/L	1.0					
Cerium-144	U	2.07	+/- 12.6	60	22.7	pCi/L	1.0					
Cesium-134	U	-2.56	+/- 1.93	10	3.02	pCi/L	1.0					
Cesium-137	U	1.33	+/- 2	10	3.85	pCi/L	1.0					
Chromium-51	U	-0.180	+/- 21.7	30	37.4	pCi/L	1.0					
Cobalt-60	U	-0.406	+/- 2.13	10	3.83	pCi/L	1.0					
Iron-59	U	2.56	+/- 4.65	10	8.38	pCi/L	1.0					
Lead-212	U	1.86	+/- 4.82	15	6.99	pCi/L	1.0					
Lead-214	U	0.957	+/- 4.12	10	7.21	pCi/L	1.0					
Potassium-40	UB	36.8	+/- 40.9	110	31.4	pCi/L	1.0					
Radium-226		8.77	+/- 7.18	6.34	8.81	pCi/L	1.0					
Radium-228	U	4.91	+/- 8.52	15	15.8	pCi/L	1.0					
Ruthenium-103	U	0.0462	+/- 2.46	10	4.47	pCi/L	1.0					
Ruthenium-106	U	9.65	+/- 18.3	90	34.7	pCi/L	1.0					
Thorium-231	U	7.20	+/- 10.8	15	18.1	pCi/L	1.0					
Thorium-232	U	1.83	+/- 4.74	15	6.87	pCi/L	1.0					
Thorium-234	U	86.6	+/- 148	350	168	pCi/L	1.0					
Uranium-235	U	4.18	+/- 13	21.5	23.6	pCi/L	1.0					
Uranium-238	U	86.6	+/- 148	500	137	pCi/L	1.0					
Zirconium-95	U	-1.71	+/- 3.98	10	6.78	pCi/L	1.0					

Comments:

DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

56

GENERAL ENGINEERING LABORATORIES

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 02, 1996

Sample ID : 027974-20 58H-GR-018-0.0-EB

M = Method	Method-Description
M 1	EPI A-013

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 02, 1996

Sample ID : 027974-20 58H-GR-018-0.0-EB

GEL Laboratory Certifications **EPI Laboratory Certifications**

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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58H

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

SF 2001-COC (6-95)

Internal Lab Batch No. 611205

AMIR - IN-HOUSE "RUSH"

AR/COC- 04945

Dept. No./Mail Stop: 7585/11428
Project/Task Manager: Mike Yuan/7585
Project Name: Foothills Test Area
Record Center Code: ER/1332/58F/DAT
Logbook Ref No:
Service Order No.: CF0180

Date Samples Shipped: 3-14-96
Carrier/Waybill No.: HC
Lab Contact: AMIR MOHAGHEGH
Lab Destination: AMIR
SMO Contact/Phone: Peg Selmi / 848-0963
Send Report to SMO D. McLaughlin

Contract No.: N/A
Case No.: 88251 10
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

Location Tech Area III
Building ____ Room ____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	GAMMA SPEC	Lab Sample ID
027923-02	58H-GR-024-0.0-SS	0.0	58H		Soil	Poly	500ml	4C	G	SA	X	
~~027924-02~~	~~58H-GR-025-0.0-SS~~											
027928-02	58H-GR-003-0.0-SS	0.0	58H		"	"	"	"	"	"	X	
027933-02	58H-GR-012-0.0-SS	0.0	58H		"	"	"	"	"	"	X	
027938-02	58H-GR-016-0.0-SS	0.0	58H		"	"	"	"	"	"	X	
												LAB USE

RMMA ☑ Yes ☐ No Ref. No. ____

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☑ Rush Required Report Date ____

Sample Tracking SMO USE
Date Entered (mm/dd/yy) ____
Entered by: ____
QC inits. ____

Special Instructions/QC Requirements
- Please send report to Mike Yuan, ED RANKIN (emo)
- Need 24 hour TURN-A-ROUND
- This COC# 04945 will release COC# 04924

Abnormal Conditions on Receipt LAB USE

Sample Team Members

Name	Signature	Init	Company/Organization/Phone
Concetta Corrunto	Concetta Corrunto	CC	Lamb/7584/844-3301
[illegible]	[illegible]	[illegible]	[illegible]
Gilbert L. Quintana	Gilbert L. Quintana	GLQ	IT/7584

1. Relinquished by		Org.	Date	Time	4. Relinquished by	Org.	Date	Time
1. Received by		Org.	Date	Time	4. Received by	Org.	Date	Time
2. Relinquished by		Org.	Date	Time	5. Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics 581H (goes with CoC# 04945)

Sample Analysis Request Form
Page 1 of 1

Shaded areas are for RPSD use only

To be completed by Customer

Customer: Mike Young
Organization: 7585/1148
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: 3-15-96
Suspect Isotopes:
Other Information:

Hazards/Special Instructions:
- Need 24 hour TURN-A-ROUND
- Send report to ED RANKIN, MIKE YOUNG, or call C.C. 284-3301, 268-7713

Batch Log Number: 60205
Logged By: Jean

LIMS Login
Results Faxed
Sample Disposal

Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
027923-02	Soil	3-13-96 1225	500ml	Gamma Spec	01	<300	896	
027928-02	"	1248	"	" "	02		820	
027933-02	"	1318	"	" "	03		807	
027938-02	"	1345	"	" "	04		873	
LCS		1/Nov/90			05			Det. 2
LCS		1/Nov/90	"		06			Det. 3

Relinquished by	Date 3/14/96	Time 1037	Received by	Date 3/14/96	Time 1037
Relinquished by	Date 3/15/96	Time 200	Received by	Date 3/15/96	Time 200
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-14-96 2:51:37 PM *
****
* *Dept 7714 Survey No._____ *
* Reviewed by: 3/15/96 *Use Only Surveyed by:_____ *
****

Customer : M.YOUNG/RANKIN (7585/SMO)
Customer Sample ID : 027938-02
Lab Sample ID : 60020504

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 873.000 gram
Sample Date/Time : 3-13-96 1:45:00 PM
Acquire Start Date : 3-14-96 1:08:20 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	1.53	8.55E-01	1.20
TH-234	8.65E-01	2.44E-01	3.14E-01
RA-226	1.14	4.05E-01	5.35E-01
PB-214	5.12E-01	1.18E-01	8.29E-02
BI-214	4.97E-01	9.32E-02	6.29E-02
TH-232	7.74E-01	3.89E-01	2.28E-01
RA-228	7.67E-01	1.88E-01	1.28E-01
AC-228	7.65E-01	1.51E-01	1.06E-01
TH-228	Not Detected	--------	5.95E-01
RA-224	7.17E-01	2.00E-01	8.25E-02
PB-212	7.63E-01	1.65E-01	3.31E-02
BI-212	8.31E-01	2.71E-01	3.33E-01
TL-208	6.51E-01	1.24E-01	8.89E-02
U-235	~~9.17E-02~~	~~1.09E-01~~	1.53E-01
TH-231	Not Detected	--------	1.32
PA-231	Not Detected	--------	1.15
TH-227	Not Detected	--------	3.19E-01
RA-223	Not Detected	--------	9.76E-02
RN-219	Not Detected	--------	3.30E-01
PB-211	Not Detected	--------	7.49E-01
TL-207	Not Detected	--------	1.24E+01
AM-241	Not Detected	--------	1.27E-01
PU-239	Not Detected	--------	2.89E+02
NP-237	Not Detected	--------	2.01E-01
PA-233	Not Detected	--------	4.86E-02
TH-229	Not Detected	--------	1.54E-01

Not detected 3/15/96

[Summary Report] - Sample ID: 60020504

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	2.85E-02
AR-41	Not Detected	--------	3.76E+02
BA-133	Not Detected	--------	5.08E-02
BA-140	Not Detected	--------	9.49E-02
CD-109	Not Detected	--------	4.88E-01
CD-115	Not Detected	--------	8.00E-02
CE-139	Not Detected	--------	2.08E-02
CE-141	Not Detected	--------	3.50E-02
CE-144	Not Detected	--------	1.50E-01
CO-56	Not Detected	--------	3.06E-02
CO-57	Not Detected	--------	1.92E-02
CO-58	Not Detected	--------	3.05E-02
CO-60	Not Detected	--------	3.65E-02
CR-51	Not Detected	--------	1.96E-01
CS-134	Not Detected	--------	4.48E-02
CS-137	Not Detected	--------	3.26E-02
CU-64	Not Detected	--------	2.50E+01
EU-152	Not Detected	--------	7.94E-02
EU-154	Not Detected	--------	1.56E-01
EU-155	Not Detected	--------	7.60E-02
FE-59	Not Detected	--------	6.52E-02
GD-153	Not Detected	--------	5.84E-02
HG-203	Not Detected	--------	2.45E-02
I-131	Not Detected	--------	2.66E-02
IN-115m	Not Detected	--------	2.49
IR-192	Not Detected	--------	2.33E-02
K-40	1.48E+01	2.06	3.43E-01
LA-140	Not Detected	--------	5.19E-02
MN-52	Not Detected	--------	3.25E-02
MN-54	~~1.35E-02~~	~~1.24E-02~~	1.94E-02 not detected 3/15/96
MN-56	Not Detected	--------	2.04E+01
MO-99	Not Detected	--------	2.90E-01
NA-22	Not Detected	--------	4.02E-02
NA-24	Not Detected	--------	9.49E-02
NB-95	Not Detected	--------	1.80E-01
ND-147	Not Detected	--------	1.79E-01
NI-57	Not Detected	--------	6.79E-02
BE-07	Not Detected	--------	2.19E-01
RU-103	Not Detected	--------	2.57E-02
RU-106	Not Detected	--------	2.77E-01
SB-122	Not Detected	--------	4.53E-02
SB-124	Not Detected	--------	2.88E-02
SB-125	Not Detected	--------	7.46E-02
SC-46	Not Detected	--------	4.96E-02
SR-85	Not Detected	--------	3.49E-02
TA-182	Not Detected	--------	1.44E-01
TA-183	Not Detected	--------	1.23E-01
TE-132	Not Detected	--------	2.62E-02
TL-201	Not Detected	--------	7.91E-02
XE-133	Not Detected	--------	8.21E-02
Y-88	Not Detected	--------	2.52E-02
ZN-65	Not Detected	--------	9.86E-02
ZR-95	Not Detected	--------	5.50E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-14-96 2:50:16 PM

Reviewed by: 3/15/96 *Dept 7714 Survey No.
*Use Only Surveyed by:

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 027933-02
Lab Sample ID : 60020503

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 807.000 gram
Sample Date/Time : 3-13-96 1:18:00 PM
Acquire Start Date : 3-14-96 1:05:26 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6002 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.55
TH-234	6.96E-01	4.00E-01	5.94E-01
RA-226	9.85E-01	4.26E-01	6.20E-01
PB-214	3.96E-01	6.80E-02	4.44E-02
BI-214	3.71E-01	6.79E-02	5.10E-02
TH-232	4.91E-01	2.32E-01	1.10E-01
RA-228	5.16E-01	1.32E-01	1.02E-01
AC-228	5.09E-01	1.08E-01	8.96E-02
TH-228	4.29E-01	1.68E-01	3.61E-01
RA-224	4.78E-01	1.33E-01	7.66E-02
PB-212	4.72E-01	8.25E-02	3.03E-02
BI-212	5.64E-01	2.24E-01	3.04E-01
TL-208	4.90E-01	8.59E-02	5.95E-02
U-235	Not Detected	--------	1.70E-01
TH-231	Not Detected	--------	1.99
PA-231	Not Detected	--------	1.10
TH-227	Not Detected	--------	2.69E-01
RA-223	Not Detected	--------	1.43E-01
RN-219	Not Detected	--------	2.99E-01
PB-211	Not Detected	--------	6.93E-01
TL-207	Not Detected	--------	1.03E+01
AM-241	Not Detected	--------	4.00E-01
PU-239	Not Detected	--------	3.38E+02
NP-237	Not Detected	--------	3.22E-01
PA-233	Not Detected	--------	4.43E-02
TH-229	Not Detected	--------	2.14E-01

[Summary Report] - Sample ID: 60020503

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	2.38E-02
AR-41	Not Detected	--------	3.31E+02
BA-133	Not Detected	--------	4.56E-02
BA-140	Not Detected	--------	8.54E-02
CD-109	Not Detected	--------	9.60E-01
CD-115	Not Detected	--------	6.64E-02
CE-139	Not Detected	--------	2.22E-02
CE-141	Not Detected	--------	3.95E-02
CE-144	Not Detected	--------	1.79E-01
CO-56	Not Detected	--------	2.65E-02
CO-57	Not Detected	--------	2.43E-02
CO-58	Not Detected	--------	2.26E-02
CO-60	Not Detected	--------	2.78E-02
CR-51	Not Detected	--------	1.76E-01
CS-134	Not Detected	--------	3.81E-02
CS-137	Not Detected	--------	2.73E-02
CU-64	Not Detected	--------	1.96E+01
EU-152	Not Detected	--------	6.56E-02
EU-154	Not Detected	--------	1.36E-01
EU-155	Not Detected	--------	4.33E-02
FE-59	Not Detected	--------	5.28E-02
GD-153	Not Detected	--------	8.60E-02
HG-203	Not Detected	--------	2.19E-02
I-131	Not Detected	--------	2.31E-02
IN-115m	Not Detected	--------	2.19
IR-192	Not Detected	--------	2.08E-02
K-40	9.92	1.39	2.53E-01
LA-140	Not Detected	--------	4.09E-02
MN-52	Not Detected	--------	2.61E-02
MN-54	Not Detected	--------	2.59E-02
MN-56	Not Detected	--------	1.97E+01
MO-99	Not Detected	--------	2.41E-01
NA-22	Not Detected	--------	3.16E-02
NA-24	Not Detected	--------	8.03E-02
NB-95	Not Detected	--------	1.52E-01
ND-147	Not Detected	--------	1.62E-01
NI-57	Not Detected	--------	5.87E-02
BE-07	Not Detected	--------	1.90E-01
RU-103	Not Detected	--------	2.09E-02
RU-106	Not Detected	--------	2.10E-01
SB-122	Not Detected	--------	3.91E-02
SB-124	Not Detected	--------	2.53E-02
SB-125	Not Detected	--------	6.10E-02
SC-46	Not Detected	--------	3.87E-02
SR-85	Not Detected	--------	2.84E-02
TA-182	Not Detected	--------	1.13E-01
TA-183	Not Detected	--------	3.98E-01
TE-132	Not Detected	--------	2.58E-02
TL-201	Not Detected	--------	1.47E-01
XE-133	Not Detected	--------	1.26E-01
Y-88	Not Detected	--------	2.13E-02
ZN-65	Not Detected	--------	7.51E-02
ZR-95	Not Detected	--------	4.48E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-15-96 11:52:17 AM *
****
* *Dept 7714 Survey No._____ *
* Reviewed by: 3/15/96 *Use Only Surveyed by:_____ *
****

Customer : M.YOUNG/RANKIN (7585/SMO)
Customer Sample ID : 027928-02
Lab Sample ID : 60020502

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 820.000 gram
Sample Date/Time : 3-13-96 12:48:00 PM
Acquire Start Date : 3-14-96 11:19:19 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	9.14E-01	8.66E-01	1.34
TH-234	1.12	3.39E-01	3.31E-01
RA-226	1.57	5.29E-01	6.91E-01
PB-214	5.53E-01	1.21E-01	6.39E-02
BI-214	5.27E-01	9.74E-02	6.07E-02
TH-232	7.41E-01	3.62E-01	1.58E-01
RA-228	7.65E-01	3.04E-01	1.59E-01
AC-228	7.54E-01	1.53E-01	1.13E-01
TH-228	4.95E-01	3.09E-01	4.50E-01
RA-224	6.14E-01	1.78E-01	8.51E-02
PB-212	7.33E-01	1.63E-01	3.57E-02
BI-212	7.30E-01	3.40E-01	4.86E-01
TL-208	6.93E-01	1.26E-01	7.56E-02
U-235	Not Detected	--------	1.57E-01
TH-231	Not Detected	--------	1.34
PA-231	Not Detected	--------	1.20
TH-227	Not Detected	--------	3.28E-01
RA-223	Not Detected	--------	9.93E-02
RN-219	Not Detected	--------	3.51E-01
PB-211	Not Detected	--------	8.18E-01
TL-207	Not Detected	--------	1.36E+01
AM-241	Not Detected	--------	1.32E-01
PU-239	Not Detected	--------	2.90E+02
NP-237	Not Detected	--------	2.06E-01
PA-233	Not Detected	--------	5.12E-02
TH-229	Not Detected	--------	1.55E-01

[Summary Report] - Sample ID: 60020502

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.83E-02
AR-41	Not Detected	--------	2.80E+02
BA-133	Not Detected	--------	5.19E-02
BA-140	Not Detected	--------	1.02E-01
CD-109	Not Detected	--------	5.61E-01
CD-115	Not Detected	--------	8.35E-02
CE-139	Not Detected	--------	2.19E-02
CE-141	Not Detected	--------	3.58E-02
CE-144	Not Detected	--------	1.52E-01
CO-56	Not Detected	--------	3.08E-02
CO-57	Not Detected	--------	1.96E-02
CO-58	Not Detected	--------	3.11E-02
CO-60	Not Detected	--------	3.19E-02
CR-51	Not Detected	--------	2.02E-01
CS-134	Not Detected	--------	4.79E-02
CS-137	2.12E-01	4.01E-02	3.15E-02
CU-64	Not Detected	--------	2.54E+01
EU-152	Not Detected	--------	7.71E-02
EU-154	Not Detected	--------	1.62E-01
EU-155	Not Detected	--------	7.76E-02
FE-59	Not Detected	--------	7.28E-02
GD-153	Not Detected	--------	5.92E-02
HG-203	Not Detected	--------	2.56E-02
I-131	Not Detected	--------	2.93E-02
IN-115m	Not Detected	--------	2.30
IR-192	Not Detected	--------	2.37E-02
K-40	1.53E+01	2.12	2.89E-01
LA-140	Not Detected	--------	5.27E-02
MN-52	Not Detected	--------	3.54E-02
MN-54	Not Detected	--------	3.33E-02
MN-56	Not Detected	--------	1.63E+01
MO-99	Not Detected	--------	2.99E-01
NA-22	~~7.82E-03~~	~~7.87E-03~~	1.53E-02 not detected 3/16/96
NA-24	Not Detected	--------	8.74E-02
NB-95	Not Detected	--------	1.83E-01
ND-147	Not Detected	--------	1.85E-01
NI-57	Not Detected	--------	6.94E-02
BE-07	Not Detected	--------	2.36E-01
RU-103	Not Detected	--------	2.64E-02
RU-106	Not Detected	--------	2.80E-01
SB-122	Not Detected	--------	4.52E-02
SB-124	Not Detected	--------	3.00E-02
SB-125	Not Detected	--------	7.60E-02
SC-46	Not Detected	--------	4.95E-02
SR-85	Not Detected	--------	3.63E-02
TA-182	Not Detected	--------	1.43E-01
TA-183	Not Detected	--------	1.27E-01
TE-132	Not Detected	--------	2.70E-02
TL-201	Not Detected	--------	8.02E-02
XE-133	Not Detected	--------	8.21E-02
Y-88	Not Detected	--------	2.63E-02
ZN-65	Not Detected	--------	9.83E-02
ZR-95	Not Detected	--------	5.16E-02

Std 584

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-14-96 1:00:41 PM

Reviewed by: 3/15/96 *Dept 7714 Survey No. *Use Only Surveyed by:

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 027923-02
Lab Sample ID : 60020501

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 896.000 gram
Sample Date/Time : 3-13-96 12:25:00 PM
Acquire Start Date : 3-14-96 11:16:55 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.89
TH-234	9.69E-01	3.26E-01	4.65E-01
RA-226	1.38	3.91E-01	4.95E-01
PB-214	5.21E-01	9.08E-02	6.98E-02
BI-214	5.37E-01	8.66E-02	4.17E-02
TH-232	6.99E-01	3.34E-01	1.85E-01
RA-228	8.59E-01	2.40E-01	1.23E-01
AC-228	7.99E-01	1.49E-01	9.81E-02
TH-228	7.24E-01	2.11E-01	3.63E-01
RA-224	7.50E-01	1.88E-01	6.60E-02
PB-212	7.77E-01	1.35E-01	3.32E-02
BI-212	8.21E-01	1.15E-01	2.57E-01
TL-208	7.12E-01	1.19E-01	8.29E-02
U-235	Not Detected	--------	2.01E-01
TH-231	Not Detected	--------	2.31
PA-231	Not Detected	--------	1.22
TH-227	Not Detected	--------	3.15E-01
RA-223	Not Detected	--------	1.62E-01
RN-219	Not Detected	--------	3.29E-01
PB-211	Not Detected	--------	7.78E-01
TL-207	Not Detected	--------	1.17E+01
AM-241	Not Detected	--------	4.55E-01
PU-239	Not Detected	--------	3.10E+02
NP-237	Not Detected	--------	2.33E-01
PA-233	Not Detected	--------	4.96E-02
TH-229	Not Detected	--------	2.42E-01

[Summary Report] - Sample ID: 60020501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.28E-02
AR-41	Not Detected	--------	2.61E+02
BA-133	Not Detected	--------	4.97E-02
BA-140	Not Detected	--------	9.48E-02
CD-109	Not Detected	--------	8.02E-01
CD-115	Not Detected	--------	7.54E-02
CE-139	Not Detected	--------	2.58E-02
CE-141	Not Detected	--------	4.58E-02
CE-144	Not Detected	--------	2.03E-01
CO-56	Not Detected	--------	2.86E-02
CO-57	Not Detected	--------	2.75E-02
CO-58	Not Detected	--------	2.73E-02
CO-60	Not Detected	--------	3.15E-02
CR-51	Not Detected	--------	1.91E-01
CS-134	Not Detected	--------	4.12E-02
CS-137	1.00E-01	3.21E-02	1.78E-02
CU-64	Not Detected	--------	2.23E+01
EU-152	Not Detected	--------	7.38E-02
EU-154	Not Detected	--------	1.53E-01
EU-155	Not Detected	--------	1.16E-01
FE-59	Not Detected	--------	6.13E-02
GD-153	Not Detected	--------	9.42E-02
HG-203	Not Detected	--------	2.45E-02
I-131	Not Detected	--------	2.50E-02
IN-115m	Not Detected	--------	2.18
IR-192	Not Detected	--------	2.29E-02
K-40	1.69E+01	2.30	2.60E-01
LA-140	Not Detected	--------	4.35E-02
MN-52	Not Detected	--------	2.84E-02
MN-54	Not Detected	--------	2.86E-02
MN-56	Not Detected	--------	1.66E+01
MO-99	Not Detected	--------	2.67E-01
NA-22	Not Detected	--------	3.51E-02
NA-24	Not Detected	--------	8.62E-02
NB-95	Not Detected	--------	1.76E-01
ND-147	Not Detected	--------	1.74E-01
NI-57	Not Detected	--------	6.52E-02
BE-07	Not Detected	--------	2.04E-01
RU-103	Not Detected	--------	2.27E-02
RU-106	Not Detected	--------	2.34E-01
SB-122	Not Detected	--------	4.39E-02
SB-124	Not Detected	--------	2.63E-02
SB-125	Not Detected	--------	6.88E-02
SC-46	Not Detected	--------	4.31E-02
SR-85	Not Detected	--------	3.10E-02
TA-182	Not Detected	--------	1.27E-01
TA-183	Not Detected	--------	4.50E-01
TE-132	Not Detected	--------	2.85E-02
TL-201	Not Detected	--------	1.67E-01
XE-133	Not Detected	--------	1.43E-01
Y-88	Not Detected	--------	2.07E-02
ZN-65	Not Detected	--------	8.41E-02
ZR-95	Not Detected	--------	4.96E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-14-96 3:46:14 PM *
****
* *Dept 7714 Survey No._____ *
* Reviewed by: 3/15/96 *Use Only Surveyed by:_____ *
****

Customer : M.YOUNG/RANKIN (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
Lab Sample ID : 60020506

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 3-14-96 3:34:02 PM
Detector Name : LAB03
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Comments:
****

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	6.45E+03
TH-234	Not Detected	--------	2.75E+03
RA-226	Not Detected	--------	5.64E+03
PB-214	Not Detected	--------	7.11E+02
BI-214	Not Detected	--------	7.03E+02
TH-232	Not Detected	--------	2.12E+03
RA-228	Not Detected	--------	3.25E+03
AC-228	Not Detected	--------	1.93E+03
TH-228	Not Detected	--------	4.47E+04
RA-224	Not Detected	--------	4.60E+02
PB-212	Not Detected	--------	3.39E+03
BI-212	Not Detected	--------	3.68E+04
TL-208	Not Detected	--------	6.92E+03
U-235	Not Detected	--------	1.46E+03
TH-231	Not Detected	--------	9.21E+03
PA-231	Not Detected	--------	1.32E+04
TH-227	Not Detected	--------	2.28E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.61E+03
PB-211	Not Detected	--------	1.25E+04
TL-207	Not Detected	--------	2.42E+05
AM-241	8.84E+04	1.39E+04	2.06E+03
PU-239	Not Detected	--------	2.50E+06
NP-237	Not Detected	--------	1.50E+03
PA-233	Not Detected	--------	6.09E+02
TH-229	Not Detected	--------	1.29E+03

[Summary Report] - Sample ID: 60020506

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	--------	4.02E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.23E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.28E+05	8.46E+04	9.71E+04
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	4.04E+06
CE-141	Not Detected	--------	4.74E+20
CE-144	Not Detected	--------	1.69E+05
CO-56	Not Detected	--------	2.01E+10
CO-57	1.71E+04	1.69E+04	2.69E+04
CO-58	Not Detected	--------	8.72E+10
CO-60	7.30E+04	9.57E+03	6.52E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	2.00E+03
CS-137	6.70E+04	8.70E+03	5.59E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.29E+03
EU-154	Not Detected	--------	2.65E+03
EU-155	Not Detected	--------	1.53E+03
FE-59	Not Detected	--------	1.89E+16
GD-153	Not Detected	--------	1.34E+05
HG-203	Not Detected	--------	1.21E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.84E+10
K-40	Not Detected	--------	1.78E+03
LA-140	Not Detected	--------	1.00E+26
MN-52	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.29E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	9.98E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	4.20E+14
RU-103	Not Detected	--------	3.91E+17
RU-106	Not Detected	--------	1.41E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	2.12E+12
SB-125	Not Detected	--------	4.35E+03
SC-46	Not Detected	--------	5.76E+09
SR-85	Not Detected	--------	4.86E+11
TA-182	Not Detected	--------	2.04E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	6.29E+07
ZN-65	Not Detected	--------	2.78E+05
ZR-95	Not Detected	--------	1.13E+12

****
*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program
* Quality Assurance Report
*
****

Report Date : 3-14-96 3:48:54 PM
QA File : C:\GENIEPC\CAMFILES\LCS3.QAF
Analyst : GLS
Sample ID : 60020506
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 3-14-96 3:34:02 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.558E-02	1.489E-02	8.840E-02	<			>
CS-137 Activity	6.702E-02	5.484E-04	6.698E-02	<			>
CO-60 Activity	7.432E-02	6.308E-04	7.323E-02	<	In		>

OK 3/15/96

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 3/15/96

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, NM 87185-1093

date: March 18, 1996
to: D.L. McLaughlin, MS-0871 (7576)

from: K.A. Roberts, MS-1093 (7714)

subject: COC: 04945: Sample Number: 027923-02, 027928-02, 027933-02, 027938-02

The reference sample may be sent to General Engineering Laboratory without violating their Materials License with the State of South Carolina, License Number 13.

If you have any questions please contact me at 845-3227.

Mike Young
Site 58H

Survey No. 3-96-0218

Radiation Protection Sample Diagnostics (7715) TA-III BLDG 6921

Smear Analysis

Date: 3/13/96
Counting Unit id: 1 (SN:# S674564)
Data file name: C:\LBXL\UNIT1\64005504.XLD
Batch Ended: 3/13/96 16:09
Crosstalk Correction: Applied
ANALYZED BY KILBANE
REVIEWED BY JPK

Alpha activity action level (DPM): 200.00
Beta activity action level (DPM): 1000.00
Certainty level for MDA and flags: 95.00%
High Voltage Setting: 1300

Application Revision: 3
Application Version: Standard

Alpha efficiency log file: pu238ab
Alpha Efficiency: 49.06%
Alpha to Beta Crosstalk: 10.98%
Alpha Background (CPM): 0.25
Alpha Correction Factor: 1.000

Beta efficiency log file: sr36ab
Beta Efficiency: 54.11%
Beta into Alpha Crosstalk: 0.85%
Beta Background (CPM): 2.65
Beta Correction Factor: 1.000

Batch ID: E.R. #58 SAMPLE & EQUIPMENT RELEASE 3-13-96 (KILBANE)

	Alpha Activity				Beta Activity				count	Alpha	Beta	Time
ID	DPM	σ	flags	MDA	DPM	σ	flags	MDA	Time	CPM	CPM	Compit
1	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	15:44
2	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	15:45
3	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	15:47
4	-0.62	2.65	<MDA	10.69	-3.02	1.99	<MDA	15.19	1.00	-0.25	-1.65	15:48
5	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	15:49
6	0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	15:50
7	-0.77	2.75	<MDA	11.78	10.04	5.33	<AL	15.17	1.00	-0.25	5.35	15:51
8	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	15:53
9	1.91	2.71	<MDA	11.32	4.21	4.23	<MDA	15.41	1.00	0.75	2.35	15:54
10	4.54	3.75	<AL	11.15	2.12	3.79	<MDA	15.53	1.00	1.75	1.35	15:55
11	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	15:56
12	-0.62	2.65	<MDA	10.69	-3.02	1.99	<MDA	15.19	1.00	-0.25	-1.65	15:57
13	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	15:58
14	-0.73	2.72	<MDA	11.49	6.31	4.62	<AL	15.18	1.00	-0.25	3.35	15:59
15	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	16:01
16	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	16:02
17	-0.64	2.66	<MDA	10.66	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	16:03
18	1.97	2.66	<MDA	10.64	-1.39	2.73	<MDA	15.41	1.00	0.75	-0.65	16:04
19	-0.62	2.65	<MDA	10.69	-3.02	1.99	<MDA	15.19	1.00	-0.25	-1.65	16:05
20	2.00	2.65	<MDA	10.67	-3.25	1.99	<MDA	15.41	1.00	0.75	-1.65	16:06
21	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	16:08
22	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	16:09

Survey Number: 3-96-02.B

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept.	Date	Time	Duration
E.R. #58F	#7585	3-13-96	1430-1600	N/A

Purpose	Request #	RWP #
SAMPLE + EQUIPMENT RELEASE	N/A	N/A

Instrument and Probe Type and Serial Number	Surveyor(s) Printed Name	Surveyor(s) Signature
ASR-1 / HP-260 / # 2355	JOHN P. Kilbane	John P Kilbane
EICRON MICRON REM # B2161		
TENNELEC LB-5100		

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. 20 Isotope UNKNOWN: cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	ALPHA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. N/A Isotope N/A: cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	RADIATION SURVEY Bkg. .009: mr em/hr (3)	Distance
1	SAMPLE BOTTLE GROUP # 027939	80	80	ND	T					<.02	CONTACT
2	# 027938										
3	# 027972										
4	# 027971										
5	# 027935										
6	# 027924 & 027923						N/A				
7	# 027921										
8	# 027973										
9	# 027932										
10	# 027920										
11	# 027922										
12	# 027933 & 027934										

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed Note (3): Indicate type, if other than gamma (i.e. n or β).

Remarks:

Reviewed by:

RPOP-008.a

Survey Number: 3-96-0218

RADIOLOGICAL SURVEY FORM CONTINUATION

Location: E.R. SITE #58

Purpose: SAMPLE + EQUIPMENT

Date: 3-13-96

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☑Yes ☐No % Eff. 20 /Isotope UNKNOWN				ALPHA CONTAMINATION Counting Data Attached ☑Yes ☐No % Eff. N/A /Isotope N/A				RADIATION SURVEY Bkg. .009	
		cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	mrem/hr (1)	Distance
13	SAMPLE BOTTLE GROUP #027928 : 027928	80	80	~~N/A~~ ND 3-13-96	T					<.02	CONTACT
14	#027926										
15	#027925										
16	#027927										
17	#027937										
18	#027936										
19	#027931										
20	#027930					N/A					
21	#027974										
22	(2) SMALL SHOVELS										
			N/A							N/A	
	N/A										

RPOP-009.a
ver 950612

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form

581H (goes with COC# 024945)

Page 1 of 1

Shaded areas are for RPSD use only

To be completed by Customer

Customer: Mike Young
Organization: 7585/1148
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: 3-15-96
Suspect Isotopes:
Other Information:

Hazards/Special Instructions:
- Need 24 hour TURN-A-ROUND
- Send report to ED RANKIN, MIKE YOUNG, or call C.C. 284-3301, 268-7713

Batch Log Number: 600205
Logged By: Dee
LIMS Login
Results Faxed
Sample Disposal

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
027923-02	Soil	3-13-96 1225	500ml	Gamma Spec	01	<300	896	
027928-02	"	1248	"	" "	02		820	
027933-02	"	1318	"	" "	03		807	
027938-02	"	1345	"	" "	04		873	
LCS		1/100/90			05			Det. 2
LCS		1/100/90	"		06			Det. 3

Relinquished by _____ Date 3/14/96 Time 1037 Received by _____ Date 3/14/96 Time 1037
Relinquished by _____ Date 3/15/96 Time 200 Received by _____ Date 3/15/96 Time 206
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

03/18/96 09:09 505 844 4970 QUALITY TECHNOLOGIES

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 2

AR/COC- 04946

SF 2001-COC (6-95)

Internal Lab Batch No. 60203 ER Site 58H AMIR-IN-HOUSE

Dept. No./Mail Stop: 7585/1148	Date Samples Shipped:	Contract No.:	
Project/Task Manager: Mike Young / 284-2575	Carrier/Waybill No.:	Case No.: 8325.110	
Project Name: Foothills Test Area	Lab Contact: Amir Mohagheghi (7715)	SMO Authorization:	
Record Center Code: ER/1332/58/DAT	Lab Destination: AMIR (844-6710)	Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154	
Logbook Ref No:	SMO Contact/Phone: Doug Salmi (848-0962)		
Service Order No.: CF0180	Send Report to SMO		

Location Tech Area III

Building ____ Room ____

Parameter & Method Requested: Gamma Spec

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
027920-02	58H-GR-001-0.0-SS	0.0	58H		Soil	Poly	500ml	4C	G	SA	
027921-02	58H-GR-002-0.0-SS	"			"	"	"	"	"	"	
027922-02	58H-GR-003-0.0-SS	"			"	"	"	"	"	"	
027925-02	58H-GR-005-0.0-SS	"		1139	"	"	"	"	"	"	
027926-02	58H-GR-006-0.0-SS	"		1241	"	"	"	"	"	"	
027927-02	58H-GR-007-0.0-SS	"			"	"	"	"	"	"	
027930-02	58H-GR-009-0.0-SS	"		1355	"	"	"	"	"	"	
027931-02	58H-GR-010-0.0-SS	"			"	"	"	"	"	"	
027932-02	58H-GR-011-0.0-SS	"			"	"	"	"	"	"	
027935-02	58H-GR-013-0.0-SS	"		1503	"	"	"	"	"	"	

RMMA ☑ Yes ☐ No Ref. No. ____

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☑ Normal ☐ Rush Required Report Date ____

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ____
Entered by: ____

QC inits. ____

Special Instructions/QC Requirements
* Please send report to Mike Young

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cuevas	Concetta Cuevas	CC	Lamb/7584/284-3301
	Rick Mayer	Rick Mayer	RM	IT/7584
	Gilbert Quintana	Gilbert Quintana	GQ	IT/7584

1. Relinquished by	Concetta Cuevas	Org. 7584	Date 3-14-96	Time 10:00	4. Relinquished by	Org.	Date	Time
1. Received by		Org. SNL 7713	Date 3/14/96	Time 1000	4. Received by	Org.	Date	Time
2. Relinquished by		Org.	Date	Time	5. Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

AR/COC- 04946

BATCH # 600203

ER Site 58H AMIR-IN-HOUSE CONTINUATION

FOOTHILLS

Project Name: TEST AREA Project/Task Manager: Mike Young Case No.: 8835.110

Location Tech Area III

Building _____ Room _____

Parameter & Method Requested

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						GAMMA SPEC	Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type		
027936-02	58H-GR-014-00-SS	0.0	58H	7/[illegible] 1135	Soil	Poly	500ml	4°	G	SA	X	
027937-02	58H-GR-015-00-SS	"	"	1141	"	"	"	"	"	"	X	
027939-02	58H-GR-016-00-SS	"	"	1145	"	"	"	"	"	"	X	
027973-02	58H-GR-017-00-SS	"	"	1155	"	"	"	"	"	"	X	
027974-12	58H-GR-018-00-EB	—	"	↓ 1115	Water	Poly	500ml	4°	G	EB	X	

Abnormal Conditions on Receipt

Recipient Initials _____

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics ER Site 58H

Sample Analysis Request Form
Page 1 of 2

To be completed by Customer This goes with COC# 049460 *Shaded areas are for RPSD use only*

Customer: Mike Young
Organization: 7585/1148ms
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: 3-28-96
Suspect Isotopes:
Other Information: 04946

Hazards/Special Instructions:
Please send reports to
Mike Young (1148ms)
or call C.C. for Pickup 284-3301
(263-7713) mdn.

Batch Log Number: 600203
Logged By: JMS
LIMS Login
Results Faxed
Sample Disposal

Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
027920-02	Soil	3-13-96 1207	500ml	Gamma Spec.	01 ✓	~~87~~ 7300	937	Det 2
027921-02	"	1213	"	"	02 ✓		765	Det 3
027922-02	"	1217	"	"	03 ✓		627	Det 2
027925-02	"	1238	"	"	04 ✓		741	Det 3
027926-02		1241	"	"	05 ✓		730	Det 2
027927-02		1245	"	"	06 ✓		805	Det 3
027930-02		1255	"	"	07 ✓		879	Det 2
027931-02		1313	"	"	08 ✓		948	Det 3
027932-02		1315	"	"	09 ✓		830	Det 2
027935-02		1323	"	"	10 ✓		672	det 03
027936-02		1338	"	"	11 ✓		903	det 02
027937-02		1341	"	"	12 ✓		830	det 03
027939-02	Soil/DUP	1345	"	"	13 ✓		844	Det 02
027973-02	Soil	1352	"	"	14 ✓		720	Det 3

Relinquished by Cornelia Camacho Date 3-14-96 Time 10:00 Received by [signature] Date 3/14/96 Time 1000
Relinquished by [signature] Date 3/26/96 Time 1425 Received by Cornelia Camacho Date 3-26-96 Time 1425
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics ER Site 58H

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer This goes with COC # 04946

Shaded areas are for RPSD use only

Customer : Mike Young
Organization: 7585/1148 MS
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: 3-28-96
Suspect Isotopes:
Other Information: 04946

Hazards/Special Instructions:

Batch Log Number: 600203
Logged By: JM

LIMS Login
Results Faxed
Sample Disposal

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

	Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
18	027974-12	Water	3-13 96 1415	500ml	Gamma Spec.	15	7300	N/A	
	LCS	—	1 Nov 80	—	γ spec	16/17	NA	NA	16-Det02 17-Det03

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-18-96 6:54:13 PM *
****
*
* Analyzed by: RT Preston 3/19/96 Reviewed by: 3/21/96 *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027920-02
Lab Sample ID : 60020301

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 937.000 gram
Sample Date/Time : 3-13-96 12:07:00 PM
Acquire Start Date : 3-18-96 5:11:14 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.91
TH-234	9.45E-01	3.29E-01	4.78E-01
RA-226	Not Detected	--------	8.62E-01
PB-214	5.23E-01	9.10E-02	7.04E-02
BI-214	4.74E-01	8.27E-02	6.01E-02
TH-232	7.26E-01	3.42E-01	1.20E-01
RA-228	7.48E-01	1.70E-01	1.18E-01
AC-228	7.75E-01	1.43E-01	8.81E-02
TH-228	8.36E-01	2.05E-01	3.83E-01
RA-224	8.38E-01	2.08E-01	8.10E-02
PB-212	7.32E-01	1.22E-01	3.42E-02
BI-212	7.51E-01	2.37E-01	2.38E-01
TL-208	6.67E-01	1.13E-01	8.27E-02
~~U-235~~	~~1.67E-01~~	~~1.30E-01~~	2.04E-01 not detected 3/21/96
TH-231	Not Detected	--------	2.35
PA-231	Not Detected	--------	1.23
TH-227	Not Detected	--------	3.11E-01
RA-223	Not Detected	--------	2.11E-01
RN-219	Not Detected	--------	3.32E-01
PB-211	Not Detected	--------	7.70E-01
TL-207	Not Detected	--------	1.11E+01
AM-241	Not Detected	--------	4.66E-01
PU-239	Not Detected	--------	6.07E+02
NP-237	Not Detected	--------	2.22E-01
PA-233	Not Detected	--------	5.01E-02
TH-229	Not Detected	--------	2.40E-01

[Summary Report] - Sample ID: 60020301

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.19E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.09E-02
BA-140	Not Detected	--------	1.14E-01
CD-109	Not Detected	--------	7.70E-01
CD-115	Not Detected	--------	2.85E-01
CE-139	Not Detected	--------	2.62E-02
CE-141	Not Detected	--------	5.17E-02
CE-144	Not Detected	--------	2.06E-01
CO-56	Not Detected	--------	2.82E-02
CO-57	Not Detected	--------	2.77E-02
CO-58	Not Detected	--------	2.60E-02
CO-60	Not Detected	--------	2.93E-02
CR-51	Not Detected	--------	2.18E-01
CS-134	Not Detected	--------	4.07E-02
CS-137	1.77E-01	3.17E-02	2.66E-02
CU-64	Not Detected	--------	5.60E+03
EU-152	Not Detected	--------	1.96E-01
EU-154	Not Detected	--------	1.50E-01
EU-155	Not Detected	--------	1.19E-01
FE-59	Not Detected	--------	6.13E-02
GD-153	Not Detected	--------	9.52E-02
HG-203	Not Detected	--------	2.62E-02
I-131	Not Detected	--------	3.60E-02
IN-115m	Not Detected	--------	1.58E+07
IR-192	Not Detected	--------	2.47E-02
K-40	1.61E+01	2.19	3.79E-01
LA-140	Not Detected	--------	2.63E-01
MN-54	Not Detected	--------	2.82E-02
MN-56	Not Detected	--------	1.34E+13
MO-99	Not Detected	--------	7.74E-01
NA-22	Not Detected	--------	3.38E-02
NA-24	Not Detected	--------	9.27
NB-95	Not Detected	--------	3.94E-01
ND-147	Not Detected	--------	2.26E-01
NI-57	Not Detected	--------	4.52E-01
BE-07	Not Detected	--------	2.18E-01
RU-103	Not Detected	--------	2.46E-02
RU-106	Not Detected	--------	2.29E-01
SB-122	Not Detected	--------	1.26E-01
SB-124	Not Detected	--------	2.70E-02
SB-125	Not Detected	--------	7.21E-02
SC-46	Not Detected	--------	4.46E-02
SR-85	Not Detected	--------	3.26E-02
TA-182	Not Detected	--------	1.30E-01
TA-183	Not Detected	--------	8.24E-01
TE-132	Not Detected	--------	7.20E-02
TL-201	Not Detected	--------	4.48E-01
V-48	Not Detected	--------	3.56E-02
XE-133	Not Detected	--------	5.51E-01
Y-88	Not Detected	--------	2.17E-02
ZN-65	Not Detected	--------	8.59E-02
ZR-95	Not Detected	--------	4.98E-02

```
*****************************************************************************
*                       Sandia National Laboratories                        *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]       *
*                          3-19-96  9:55:08 AM                              *
*****************************************************************************
*                                                                           *
* Analyzed by: RJPreston 3/19/96      Reviewed by:            3/21/96       *
*****************************************************************************
```

Customer : M. YOUNG (7585)
Customer Sample ID : 027921-02
Lab Sample ID : 60020302

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 765.000 gram
Sample Date/Time : 3-13-96 12:13:00 PM
Acquire Start Date : 3-19-96 8:11:25 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.19
TH-234	1.13	2.98E-01	3.56E-01
RA-226	1.44	5.44E-01	7.43E-01
PB-214	6.81E-01	1.47E-01	7.33E-02
BI-214	5.68E-01	1.03E-01	5.64E-02
TH-232	9.16E-01	4.44E-01	1.79E-01
RA-228	8.60E-01	2.13E-01	1.53E-01
AC-228	9.15E-01	1.84E-01	1.39E-01
TH-228	5.55E-01	3.14E-01	4.45E-01
RA-224	8.42E-01	2.35E-01	1.03E-01
PB-212	9.32E-01	2.01E-01	3.72E-02
BI-212	1.07	3.57E-01	4.55E-01
TL-208	8.92E-01	1.64E-01	1.10E-01
U-235	Not Detected	--------	1.75E-01
TH-231	Not Detected	--------	1.46
PA-231	Not Detected	--------	1.27
TH-227	Not Detected	--------	3.77E-01
RA-223	Not Detected	--------	1.43E-01
RN-219	Not Detected	--------	3.81E-01
PB-211	Not Detected	--------	8.75E-01
TL-207	Not Detected	--------	1.45E+01
AM-241	Not Detected	--------	1.45E-01
PU-239	Not Detected	--------	3.12E+02
NP-237	Not Detected	--------	1.65E-01
PA-233	Not Detected	--------	5.49E-02
TH-229	Not Detected	--------	1.65E-01

[Summary Report] - Sample ID: 60020302

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.20E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.39E-02
BA-140	Not Detected	--------	1.43E-01
CD-109	Not Detected	--------	7.85E-01
CD-115	Not Detected	--------	4.21E-01
CE-139	Not Detected	--------	2.49E-02
CE-141	Not Detected	--------	4.48E-02
CE-144	Not Detected	--------	1.68E-01
CO-56	Not Detected	--------	3.53E-02
CO-57	Not Detected	--------	2.14E-02
CO-58	Not Detected	--------	3.53E-02
CO-60	Not Detected	--------	3.76E-02
CR-51	Not Detected	--------	2.51E-01
CS-134	Not Detected	--------	5.33E-02
CS-137	9.06E-02	2.69E-02	2.36E-02
CU-64	Not Detected	--------	1.62E+04
EU-152	Not Detected	--------	2.39E-01
EU-154	Not Detected	--------	1.86E-01
EU-155	Not Detected	--------	6.59E-02
FE-59	Not Detected	--------	8.22E-02
GD-153	Not Detected	--------	6.59E-02
HG-203	Not Detected	--------	2.96E-02
I-131	Not Detected	--------	4.59E-02
IN-115m	Not Detected	--------	1.92E+08
IR-192	Not Detected	--------	2.72E-02
K-40	1.70E+01	2.36	3.77E-01
LA-140	Not Detected	--------	4.54E-01
MN-54	Not Detected	--------	3.73E-02
MN-56	Not Detected	--------	9.16E+14
MO-99	Not Detected	--------	1.18
NA-22	Not Detected	--------	4.59E-02
NA-24	Not Detected	--------	2.31E+01
NB-95	Not Detected	--------	5.40E-01
ND-147	Not Detected	--------	2.90E-01
NI-57	Not Detected	--------	7.38E-01
BE-07	Not Detected	--------	2.62E-01
RU-103	Not Detected	--------	2.99E-02
RU-106	Not Detected	--------	3.09E-01
SB-122	Not Detected	--------	1.86E-01
SB-124	Not Detected	--------	3.51E-02
SB-125	Not Detected	--------	7.89E-02
SC-46	Not Detected	--------	5.70E-02
SR-85	Not Detected	--------	4.09E-02
TA-182	Not Detected	--------	1.66E-01
TA-183	Not Detected	--------	2.73E-01
TE-132	Not Detected	--------	8.44E-02
TL-201	Not Detected	--------	2.71E-01
V-48	Not Detected	--------	4.62E-02
XE-133	Not Detected	--------	4.14E-01
Y-88	Not Detected	--------	2.97E-02
ZN-65	Not Detected	--------	1.07E-01
ZR-95	Not Detected	--------	6.50E-02

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-19-96 10:11:45 AM
*
* Analyzed by: 3/21/96 Reviewed by: 3/21/96
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027922-02
Lab Sample ID : 60020303

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 627.000 gram
Sample Date/Time : 3-13-96 12:17:00 PM
Acquire Start Date : 3-19-96 8:23:02 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.52
TH-234	Not Detected	--------	5.73E-01
RA-226	9.65E-01	4.07E-01	5.81E-01
PB-214	4.33E-01	8.11E-02	6.74E-02
BI-214	3.36E-01	7.15E-02	6.92E-02
TH-232	8.47E-01	4.02E-01	2.06E-01
RA-228	8.99E-01	2.16E-01	1.58E-01
AC-228	9.15E-01	1.40E-01	9.38E-02
TH-228	8.72E-01	2.82E-01	4.87E-01
RA-224	9.55E-01	2.44E-01	1.02E-01
PB-212	8.63E-01	1.47E-01	4.50E-02
BI-212	1.04	3.36E-01	4.27E-01
TL-208	7.49E-01	1.29E-01	9.15E-02
U-235	Not Detected	--------	2.45E-01
TH-231	Not Detected	--------	2.86
PA-231	Not Detected	--------	1.50
TH-227	Not Detected	--------	4.00E-01
RA-223	Not Detected	--------	2.65E-01
RN-219	Not Detected	--------	4.15E-01
PB-211	Not Detected	--------	9.61E-01
TL-207	Not Detected	--------	1.48E+01
AM-241	Not Detected	--------	5.73E-01
PU-239	Not Detected	--------	3.99E+02
NP-237	Not Detected	--------	3.96E-01
PA-233	Not Detected	--------	6.20E-02
TH-229	Not Detected	--------	2.96E-01

[Summary Report] - Sample ID: 60020303

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	5.26E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.25E-02
BA-140	Not Detected	--------	1.49E-01
CD-109	Not Detected	--------	1.04
CD-115	Not Detected	--------	4.38E-01
CE-139	Not Detected	--------	3.15E-02
CE-141	Not Detected	--------	6.22E-02
CE-144	Not Detected	--------	2.47E-01
CO-56	Not Detected	--------	3.73E-02
CO-57	Not Detected	--------	3.39E-02
CO-58	Not Detected	--------	3.33E-02
CO-60	Not Detected	--------	3.71E-02
CR-51	Not Detected	--------	2.75E-01
CS-134	Not Detected	--------	4.89E-02
CS-137	1.85E-01	4.74E-02	3.13E-02
CU-64	Not Detected	--------	1.69E+04
EU-152	Not Detected	--------	2.53E-01
EU-154	Not Detected	--------	1.93E-01
EU-155	Not Detected	--------	1.42E-01
FE-59	Not Detected	--------	8.09E-02
GD-153	Not Detected	--------	1.18E-01
HG-203	Not Detected	--------	3.27E-02
I-131	Not Detected	--------	4.80E-02
IN-115m	Not Detected	--------	2.03E+08
IR-192	Not Detected	--------	3.01E-02
K-40	1.37E+01	1.91	4.86E-01
LA-140	Not Detected	--------	4.31E-01
MN-54	Not Detected	--------	1.98E-02
MN-56	Not Detected	--------	1.00E+15
MO-99	Not Detected	--------	1.12
NA-22	Not Detected	--------	4.27E-02
NA-24	Not Detected	--------	2.19E+01
NB-95	Not Detected	--------	5.71E-01
ND-147	Not Detected	--------	2.82E-01
NI-57	Not Detected	--------	7.20E-01
~~BE-07~~	~~8.38E-02~~	~~1.01E-01~~	1.61E-01 Not detected 3/21/96
RU-103	Not Detected	--------	3.12E-02
RU-106	Not Detected	--------	2.97E-01
SB-122	Not Detected	--------	1.97E-01
SB-124	Not Detected	--------	3.49E-02
SB-125	Not Detected	--------	8.85E-02
SC-46	Not Detected	--------	5.41E-02
SR-85	Not Detected	--------	4.21E-02
TA-182	Not Detected	--------	1.59E-01
TA-183	Not Detected	--------	1.10
TE-132	Not Detected	--------	9.98E-02
TL-201	Not Detected	--------	6.35E-01
V-48	Not Detected	--------	4.45E-02
XE-133	Not Detected	--------	8.29E-01
Y-88	Not Detected	--------	2.61E-02
ZN-65	Not Detected	--------	1.03E-01
ZR-95	Not Detected	--------	6.59E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-19-96 11:46:07 AM *
****
*
* Analyzed by: R T Preston 3/19/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027925-02
Lab Sample ID : 60020304

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 741.000 gram
Sample Date/Time : 3-13-96 12:38:00 PM
Acquire Start Date : 3-19-96 10:02:37 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.07
TH-234	6.06E-01	2.12E-01	3.14E-01
RA-226	1.53	5.15E-01	6.67E-01
PB-214	5.38E-01	1.22E-01	7.72E-02
BI-214	5.21E-01	9.99E-02	7.05E-02
TH-232	7.26E-01	3.55E-01	1.55E-01
RA-228	6.60E-01	2.60E-01	1.65E-01
AC-228	7.58E-01	1.60E-01	1.31E-01
TH-228	4.50E-01	3.88E-01	5.99E-01
RA-224	6.66E-01	1.96E-01	1.02E-01
PB-212	7.46E-01	1.63E-01	3.49E-02
BI-212	1.05	3.25E-01	3.87E-01
TL-208	6.57E-01	1.25E-01	8.36E-02
U-235	~~7.60E-02~~	~~1.15E-01~~	1.62E-01 Not detected 3/4/96
TH-231	Not Detected	--------	1.36
PA-231	Not Detected	--------	1.19
TH-227	Not Detected	--------	3.43E-01
RA-223	Not Detected	--------	1.33E-01
RN-219	Not Detected	--------	3.57E-01
PB-211	Not Detected	--------	7.94E-01
TL-207	Not Detected	--------	1.34E+01
AM-241	Not Detected	--------	1.36E-01
PU-239	Not Detected	--------	2.99E+02
NP-237	Not Detected	--------	2.10E-01
PA-233	Not Detected	--------	5.13E-02
TH-229	Not Detected	--------	1.58E-01

[Summary Report] - Sample ID: 60020304

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.08E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.20E-02
BA-140	Not Detected	--------	1.44E-01
CD-109	Not Detected	--------	5.37E-01
CD-115	Not Detected	--------	4.09E-01
CE-139	Not Detected	--------	2.32E-02
CE-141	Not Detected	--------	4.14E-02
CE-144	Not Detected	--------	1.52E-01
CO-56	Not Detected	--------	3.32E-02
CO-57	Not Detected	--------	2.03E-02
CO-58	Not Detected	--------	3.36E-02
CO-60	Not Detected	--------	3.68E-02
CR-51	Not Detected	--------	2.25E-01
CS-134	Not Detected	--------	5.00E-02
CS-137	7.31E-02	2.31E-02	2.82E-02
CU-64	Not Detected	--------	1.65E+04
EU-152	Not Detected	--------	2.20E-01
EU-154	Not Detected	--------	1.75E-01
EU-155	Not Detected	--------	3.81E-02
FE-59	Not Detected	--------	7.79E-02
GD-153	Not Detected	--------	6.22E-02
HG-203	Not Detected	--------	2.74E-02
I-131	Not Detected	--------	4.47E-02
IN-115m	Not Detected	--------	2.29E+08
IR-192	Not Detected	--------	2.45E-02
K-40	1.26E+01	1.79	4.13E-01
LA-140	Not Detected	--------	4.64E-01
MN-54	Not Detected	--------	3.28E-02
MN-56	Not Detected	--------	1.27E+15
MO-99	Not Detected	--------	1.12
NA-22	Not Detected	--------	3.98E-02
NA-24	Not Detected	--------	2.14E+01
NB-95	Not Detected	--------	4.97E-01
ND-147	Not Detected	--------	2.74E-01
NI-57	Not Detected	--------	7.27E-01
BE-07	Not Detected	--------	2.54E-01
RU-103	Not Detected	--------	2.91E-02
RU-106	Not Detected	--------	2.85E-01
SB-122	Not Detected	--------	1.70E-01
SB-124	Not Detected	--------	3.21E-02
SB-125	Not Detected	--------	7.71E-02
SC-46	Not Detected	--------	5.52E-02
SR-85	Not Detected	--------	3.83E-02
TA-182	Not Detected	--------	1.58E-01
TA-183	Not Detected	--------	2.57E-01
TE-132	Not Detected	--------	7.82E-02
TL-201	Not Detected	--------	2.57E-01
V-48	Not Detected	--------	4.54E-02
XE-133	Not Detected	--------	3.92E-01
Y-88	Not Detected	--------	2.87E-02
ZN-65	Not Detected	--------	1.03E-01
ZR-95	Not Detected	--------	6.26E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-21-96 5:33:54 PM *
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* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7785)
Customer Sample ID : 027926-02
Lab Sample ID : 60020305

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 730.000 gram
Sample Date/Time : 3-13-96 12:41:00 PM
Acquire Start Date : 3-19-96 10:22:51 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.03
TH-234	9.36E-01	3.42E-01	4.69E-01
RA-226	1.24	3.65E-01	4.61E-01
PB-214	5.24E-01	8.69E-02	5.10E-02
BI-214	4.92E-01	8.44E-02	5.26E-02
TH-232	6.91E-01	3.36E-01	2.08E-01
RA-228	7.92E-01	2.15E-01	1.20E-01
AC-228	7.72E-01	1.48E-01	9.72E-02
TH-228	6.43E-01	2.30E-01	4.55E-01
RA-224	7.70E-01	2.01E-01	1.01E-01
PB-212	7.41E-01	1.30E-01	3.70E-02
BI-212	8.14E-01	1.14E-01	2.51E-01
TL-208	6.35E-01	1.12E-01	8.48E-02
U-235	Not Detected	--------	2.10E-01
TH-231	Not Detected	--------	2.46
PA-231	Not Detected	--------	1.29
TH-227	Not Detected	--------	3.39E-01
RA-223	Not Detected	--------	2.29E-01
RN-219	Not Detected	--------	3.41E-01
PB-211	Not Detected	--------	8.11E-01
TL-207	Not Detected	--------	1.19E+01
AM-241	Not Detected	--------	4.92E-01
PU-239	Not Detected	--------	3.43E+02
NP-237	Not Detected	--------	2.51E-01
PA-233	Not Detected	--------	5.19E-02
TH-229	Not Detected	--------	2.52E-01

[Summary Report] - Sample ID: 60020305

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.77E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.41E-02
BA-140	Not Detected	--------	1.31E-01
CD-109	Not Detected	--------	8.69E-01
CD-115	Not Detected	--------	3.72E-01
CE-139	Not Detected	--------	2.74E-02
CE-141	Not Detected	--------	5.33E-02
CE-144	Not Detected	--------	2.16E-01
CO-56	Not Detected	--------	3.34E-02
CO-57	Not Detected	--------	2.84E-02
CO-58	Not Detected	--------	2.92E-02
CO-60	Not Detected	--------	3.32E-02
CR-51	Not Detected	--------	2.31E-01
CS-134	Not Detected	--------	4.36E-02
CS-137	1.04E-01	2.64E-02	2.04E-02
CU-64	Not Detected	--------	1.50E+04
EU-152	Not Detected	--------	2.27E-01
EU-154	Not Detected	--------	1.62E-01
EU-155	Not Detected	--------	1.25E-01
FE-59	Not Detected	--------	6.58E-02
GD-153	Not Detected	--------	1.02E-01
HG-203	Not Detected	--------	2.88E-02
I-131	Not Detected	--------	4.06E-02
IN-115m	Not Detected	--------	2.17E+08
IR-192	Not Detected	--------	2.56E-02
K-40	1.31E+01	1.82	3.10E-01
LA-140	Not Detected	--------	3.85E-01
MN-54	Not Detected	--------	3.17E-02
MN-56	Not Detected	--------	1.37E+15
MO-99	Not Detected	--------	9.89E-01
NA-22	Not Detected	--------	3.52E-02
NA-24	Not Detected	--------	2.17E+01
NB-95	Not Detected	--------	4.89E-01
ND-147	Not Detected	--------	2.63E-01
NI-57	Not Detected	--------	6.73E-01
BE-07	Not Detected	--------	2.33E-01
RU-103	Not Detected	--------	2.72E-02
RU-106	Not Detected	--------	2.53E-01
SB-122	Not Detected	--------	1.67E-01
SB-124	Not Detected	--------	2.95E-02
SB-125	Not Detected	--------	7.41E-02
SC-46	Not Detected	--------	4.75E-02
SR-85	Not Detected	--------	3.54E-02
TA-182	Not Detected	--------	1.37E-01
TA-183	Not Detected	--------	9.48E-01
TE-132	Not Detected	--------	8.68E-02
TL-201	Not Detected	--------	5.52E-01
V-48	Not Detected	--------	3.66E-02
XE-133	Not Detected	--------	7.28E-01
Y-88	Not Detected	--------	2.51E-02
ZN-65	Not Detected	--------	8.93E-02
ZR-95	Not Detected	--------	5.50E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-19-96 1:41:30 PM *
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*
* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027927-02
Lab Sample ID : 60020306

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 805.000 gram
Sample Date/Time : 3-13-96 12:45:00 PM
Acquire Start Date : 3-19-96 11:53:00 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.00
TH-234	7.63E-01	2.44E-01	3.17E-01
RA-226	1.35	4.88E-01	6.53E-01
PB-214	5.33E-01	1.17E-01	6.43E-02
BI-214	4.73E-01	9.19E-02	6.78E-02
TH-232	6.44E-01	3.23E-01	1.78E-01
RA-228	7.79E-01	3.24E-01	1.36E-01
AC-228	7.50E-01	1.52E-01	1.13E-01
TH-228	5.86E-01	3.23E-01	4.56E-01
RA-224	6.77E-01	1.92E-01	7.46E-02
PB-212	6.76E-01	1.48E-01	3.25E-02
BI-212	8.27E-01	2.97E-01	3.84E-01
TL-208	6.07E-01	1.20E-01	9.39E-02
U-235	Not Detected	--------	1.52E-01
TH-231	Not Detected	--------	1.32
PA-231	Not Detected	--------	1.08
TH-227	Not Detected	--------	3.13E-01
RA-223	Not Detected	--------	1.30E-01
RN-219	Not Detected	--------	3.42E-01
PB-211	Not Detected	--------	7.93E-01
TL-207	Not Detected	--------	1.28E+01
AM-241	Not Detected	--------	1.27E-01
PU-239	Not Detected	--------	2.75E+02
NP-237	Not Detected	--------	1.97E-01
PA-233	Not Detected	--------	4.86E-02
TH-229	Not Detected	--------	1.52E-01

[Summary Report] - Sample ID: 60020306

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.92E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	4.88E-02
BA-140	Not Detected	--------	1.23E-01
CD-109	Not Detected	--------	5.44E-01
CD-115	Not Detected	--------	3.76E-01
CE-139	Not Detected	--------	2.16E-02
CE-141	Not Detected	--------	3.90E-02
CE-144	Not Detected	--------	1.51E-01
CO-56	Not Detected	--------	3.28E-02
CO-57	Not Detected	--------	1.86E-02
CO-58	Not Detected	--------	3.09E-02
CO-60	Not Detected	--------	3.47E-02
CR-51	Not Detected	--------	2.14E-01
CS-134	Not Detected	--------	4.74E-02
CS-137	9.73E-02	2.62E-02	2.97E-02
CU-64	Not Detected	--------	1.65E+04
EU-152	Not Detected	--------	2.21E-01
EU-154	Not Detected	--------	1.60E-01
EU-155	Not Detected	--------	7.42E-02
FE-59	Not Detected	--------	7.29E-02
GD-153	Not Detected	--------	5.75E-02
HG-203	Not Detected	--------	2.58E-02
I-131	Not Detected	--------	4.30E-02
IN-115m	Not Detected	--------	2.68E+08
IR-192	Not Detected	--------	2.41E-02
K-40	1.27E+01	1.79	2.98E-01
LA-140	Not Detected	--------	4.32E-01
MN-54	Not Detected	--------	3.18E-02
MN-56	Not Detected	--------	1.98E+15
MO-99	Not Detected	--------	1.01
NA-22	Not Detected	--------	3.77E-02
NA-24	Not Detected	--------	2.35E+01
NB-95	Not Detected	--------	4.60E-01
ND-147	Not Detected	--------	2.55E-01
NI-57	Not Detected	--------	7.08E-01
BE-07	Not Detected	--------	2.30E-01
RU-103	Not Detected	--------	2.62E-02
RU-106	Not Detected	--------	2.76E-01
SB-122	Not Detected	--------	1.65E-01
SB-124	Not Detected	--------	3.11E-02
SB-125	Not Detected	--------	7.36E-02
SC-46	Not Detected	--------	5.11E-02
SR-85	Not Detected	--------	3.66E-02
TA-182	Not Detected	--------	1.47E-01
TA-183	Not Detected	--------	2.40E-01
TE-132	Not Detected	--------	7.55E-02
TL-201	Not Detected	--------	2.42E-01
V-48	Not Detected	--------	4.20E-02
XE-133	Not Detected	--------	3.84E-01
Y-88	Not Detected	--------	2.62E-02
ZN-65	Not Detected	--------	9.65E-02
ZR-95	Not Detected	--------	5.51E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-19-96 2:27:25 PM
*
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* Analyzed by: 3/28/96 Reviewed by: 3/28/96

Customer : M. YOUNG (7785)
Customer Sample ID : 027930-02
Lab Sample ID : 60020307

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 879.000 gram
Sample Date/Time : 3-13-96 12:55:00 PM
Acquire Start Date : 3-19-96 12:38:43 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.68
TH-234	Not Detected	--------	6.17E-01
RA-226	7.56E-01	4.88E-01	7.54E-01
PB-214	3.53E-01	7.11E-02	4.34E-02
BI-214	3.14E-01	6.02E-02	5.07E-02
TH-232	6.10E-01	3.00E-01	1.96E-01
RA-228	7.62E-01	2.72E-01	1.19E-01
AC-228	5.63E-01	1.15E-01	9.09E-02
TH-228	5.25E-01	1.87E-01	3.52E-01
RA-224	5.79E-01	1.52E-01	6.77E-02
PB-212	5.99E-01	1.02E-01	3.37E-02
BI-212	5.18E-01	2.13E-01	2.93E-01
TL-208	5.24E-01	9.58E-02	8.06E-02
~~U-235~~	~~7.76E-02~~	~~1.46E-01~~	1.88E-01 Not detected 3/28/96
TH-231	Not Detected	--------	2.21
PA-231	Not Detected	--------	1.14
TH-227	Not Detected	--------	2.89E-01
RA-223	Not Detected	--------	2.06E-01
RN-219	Not Detected	--------	3.01E-01
PB-211	Not Detected	--------	7.13E-01
TL-207	Not Detected	--------	1.01E+01
AM-241	Not Detected	--------	4.25E-01
PU-239	Not Detected	--------	4.05E+02
NP-237	Not Detected	--------	3.03E-01
PA-233	Not Detected	--------	4.67E-02
TH-229	Not Detected	--------	2.28E-01

[Summary Report] - Sample ID: 60020307

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	2.93E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	4.66E-02
BA-140	Not Detected	--------	1.11E-01
CD-109	Not Detected	--------	1.02
CD-115	Not Detected	--------	3.30E-01
CE-139	Not Detected	--------	2.43E-02
CE-141	Not Detected	--------	4.76E-02
CE-144	Not Detected	--------	1.90E-01
CO-56	~~9.50E-03~~	~~1.15E-02~~	1.85E-02 Not detected 3/21/96
CO-57	Not Detected	--------	2.57E-02
CO-58	Not Detected	--------	2.44E-02
CO-60	Not Detected	--------	2.96E-02
CR-51	Not Detected	--------	2.07E-01
CS-134	Not Detected	--------	3.80E-02
CS-137	Not Detected	--------	3.22E-02
CU-64	Not Detected	--------	1.65E+04
EU-152	Not Detected	--------	1.99E-01
EU-154	Not Detected	--------	1.40E-01
EU-155	Not Detected	--------	1.11E-01
FE-59	Not Detected	--------	6.14E-02
GD-153	Not Detected	--------	9.17E-02
HG-203	Not Detected	--------	2.50E-02
I-131	Not Detected	--------	3.57E-02
IN-115m	Not Detected	--------	2.56E+08
IR-192	Not Detected	--------	2.28E-02
K-40	1.32E+01	1.82	3.54E-01
LA-140	Not Detected	--------	3.54E-01
MN-54	Not Detected	--------	2.67E-02
MN-56	Not Detected	--------	2.05E+15
MO-99	Not Detected	--------	8.68E-01
NA-22	Not Detected	--------	3.31E-02
NA-24	Not Detected	--------	1.87E+01
NB-95	Not Detected	--------	4.25E-01
ND-147	Not Detected	--------	2.20E-01
NI-57	Not Detected	--------	5.69E-01
BE-07	Not Detected	--------	2.12E-01
RU-103	Not Detected	--------	2.38E-02
RU-106	Not Detected	--------	2.29E-01
SB-122	Not Detected	--------	1.47E-01
SB-124	Not Detected	--------	2.59E-02
SB-125	Not Detected	--------	6.60E-02
SC-46	Not Detected	--------	4.24E-02
SR-85	Not Detected	--------	3.08E-02
TA-182	Not Detected	--------	1.24E-01
TA-183	Not Detected	--------	8.23E-01
TE-132	Not Detected	--------	8.00E-02
TL-201	Not Detected	--------	5.03E-01
V-48	Not Detected	--------	3.44E-02
XE-133	Not Detected	--------	6.71E-01
Y-88	Not Detected	--------	2.16E-02
ZN-65	Not Detected	--------	8.20E-02
ZR-95	Not Detected	--------	4.87E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-21-96 5:45:37 PM *
****
*
* Analyzed by: 3/20/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027931-02
Lab Sample ID : 60020308

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 948.000 gram
Sample Date/Time : 3-13-96 1:13:00 PM
Acquire Start Date : 3-19-96 2:03:21 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	6.18E-01	4.74E-01	7.09E-01
TH-234	7.11E-01	2.12E-01	2.77E-01
RA-226	8.47E-01	4.79E-01	7.21E-01
PB-214	3.60E-01	8.31E-02	5.64E-02
BI-214	3.04E-01	6.45E-02	5.60E-02
TH-232	6.62E-01	3.36E-01	2.05E-01
RA-228	5.93E-01	1.61E-01	1.27E-01
AC-228	5.35E-01	1.10E-01	7.84E-02
TH-228	Not Detected	--------	5.11E-01
RA-224	4.75E-01	1.39E-01	6.20E-02
PB-212	5.66E-01	1.20E-01	2.89E-02
BI-212	5.81E-01	2.44E-01	3.34E-01
TL-208	5.22E-01	1.02E-01	7.58E-02
U-235	Not Detected	--------	1.36E-01
TH-231	Not Detected	--------	1.16
PA-231	Not Detected	--------	1.03
TH-227	Not Detected	--------	2.67E-01
RA-223	Not Detected	--------	1.14E-01
RN-219	Not Detected	--------	2.86E-01
PB-211	Not Detected	--------	6.52E-01
TL-207	Not Detected	--------	1.18E+01
AM-241	Not Detected	--------	1.12E-01
PU-239	Not Detected	--------	2.47E+02
NP-237	Not Detected	--------	1.66E-01
PA-233	Not Detected	--------	4.20E-02
TH-229	Not Detected	--------	1.33E-01

[Summary Report] - Sample ID: 60020308

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.01E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	4.17E-02
BA-140	Not Detected	--------	1.21E-01
CD-109	Not Detected	--------	4.51E-01
CD-115	Not Detected	--------	3.37E-01
CE-139	Not Detected	--------	1.93E-02
CE-141	Not Detected	--------	3.49E-02
CE-144	Not Detected	--------	1.36E-01
CO-56	Not Detected	--------	2.82E-02
CO-57	Not Detected	--------	1.69E-02
CO-58	Not Detected	--------	2.84E-02
CO-60	Not Detected	--------	3.27E-02
CR-51	Not Detected	--------	1.93E-01
CS-134	Not Detected	--------	3.73E-02
CS-137	2.04E-02	1.41E-02	2.13E-02
CU-64	Not Detected	--------	1.89E+04
EU-152	Not Detected	--------	1.98E-01
EU-154	Not Detected	--------	1.36E-01
EU-155	Not Detected	--------	6.98E-02
FE-59	Not Detected	--------	6.81E-02
GD-153	Not Detected	--------	5.12E-02
HG-203	Not Detected	--------	2.24E-02
I-131	Not Detected	--------	3.55E-02
IN-115m	Not Detected	--------	3.07E+08
IR-192	Not Detected	--------	2.08E-02
K-40	1.63E+01	2.24	2.97E-01
LA-140	Not Detected	--------	3.20E-01
MN-54	Not Detected	--------	2.95E-02
MN-56	Not Detected	--------	2.70E+15
MO-99	Not Detected	--------	9.55E-01
NA-22	Not Detected	--------	3.88E-02
NA-24	Not Detected	--------	2.60E+01
NB-95	Not Detected	--------	3.98E-01
ND-147	Not Detected	--------	2.38E-01
NI-57	Not Detected	--------	6.84E-01
BE-07	Not Detected	--------	2.06E-01
RU-103	Not Detected	--------	2.42E-02
RU-106	Not Detected	--------	2.42E-01
SB-122	Not Detected	--------	1.46E-01
SB-124	Not Detected	--------	2.67E-02
SB-125	Not Detected	--------	6.33E-02
SC-46	Not Detected	--------	4.43E-02
SR-85	Not Detected	--------	3.15E-02
TA-182	Not Detected	--------	1.28E-01
TA-183	Not Detected	--------	2.17E-01
TE-132	Not Detected	--------	6.87E-02
TL-201	Not Detected	--------	2.20E-01
V-48	Not Detected	--------	3.98E-02
XE-133	Not Detected	--------	3.56E-01
Y-88	Not Detected	--------	2.25E-02
ZN-65	Not Detected	--------	8.46E-02
ZR-95	Not Detected	--------	5.15E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-19-96 6:41:24 PM *
****
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* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027932-02
Lab Sample ID : 60020309

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 830.000 gram
Sample Date/Time : 3-13-96 1:15:00 PM
Acquire Start Date : 3-19-96 4:58:33 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.64
TH-234	5.74E-01	2.94E-01	4.70E-01
RA-226	7.60E-01	3.91E-01	5.85E-01
PB-214	3.10E-01	6.06E-02	5.48E-02
BI-214	2.47E-01	5.90E-02	6.62E-02
TH-232	5.83E-01	2.79E-01	1.50E-01
RA-228	5.59E-01	2.16E-01	1.19E-01
AC-228	4.90E-01	1.08E-01	9.81E-02
TH-228	4.34E-01	1.80E-01	3.77E-01
RA-224	5.40E-01	1.44E-01	6.63E-02
PB-212	5.35E-01	9.33E-02	3.43E-02
BI-212	5.80E-01	2.44E-01	3.41E-01
TL-208	4.86E-01	8.95E-02	7.33E-02
U-235	Not Detected	--------	1.84E-01
TH-231	Not Detected	--------	2.14
PA-231	Not Detected	--------	1.11
TH-227	Not Detected	--------	2.87E-01
RA-223	Not Detected	--------	2.03E-01
RN-219	Not Detected	--------	2.96E-01
PB-211	Not Detected	--------	6.93E-01
TL-207	Not Detected	--------	1.12E+01
AM-241	Not Detected	--------	4.40E-01
PU-239	Not Detected	--------	2.49E+02
NP-237	Not Detected	--------	2.02E-01
PA-233	Not Detected	--------	4.68E-02
TH-229	Not Detected	--------	2.23E-01

[Summary Report] - Sample ID: 60020309

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	2.73E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	4.78E-02
BA-140	Not Detected	--------	1.18E-01
CD-109	Not Detected	--------	7.00E-01
CD-115	Not Detected	--------	3.51E-01
CE-139	Not Detected	--------	2.43E-02
CE-141	Not Detected	--------	4.72E-02
CE-144	Not Detected	--------	1.89E-01
CO-56	Not Detected	--------	2.86E-02
CO-57	Not Detected	--------	2.57E-02
CO-58	Not Detected	--------	2.50E-02
CO-60	Not Detected	--------	2.87E-02
CR-51	Not Detected	--------	2.04E-01
CS-134	Not Detected	--------	3.81E-02
CS-137	Not Detected	--------	3.02E-02
CU-64	Not Detected	--------	1.89E+04
EU-152	Not Detected	--------	1.95E-01
EU-154	Not Detected	--------	1.46E-01
EU-155	Not Detected	--------	1.06E-01
FE-59	Not Detected	--------	6.13E-02
GD-153	Not Detected	--------	8.96E-02
HG-203	Not Detected	--------	2.44E-02
I-131	Not Detected	--------	3.66E-02
IN-115m	Not Detected	--------	4.80E+08
IR-192	Not Detected	--------	2.29E-02
K-40	1.10E+01	1.54	3.93E-01
LA-140	Not Detected	--------	3.61E-01
MN-54	Not Detected	--------	2.71E-02
MN-56	Not Detected	--------	5.94E+15
MO-99	Not Detected	--------	9.18E-01
NA-22	Not Detected	--------	3.20E-02
NA-24	Not Detected	--------	2.33E+01
NB-95	Not Detected	--------	4.35E-01
ND-147	Not Detected	--------	2.34E-01
NI-57	Not Detected	--------	6.29E-01
BE-07	Not Detected	--------	2.09E-01
RU-103	Not Detected	--------	2.42E-02
RU-106	Not Detected	--------	2.23E-01
SB-122	~~4.22E-02~~	~~5.33E-02~~	8.59E-02 Not detected 3/21/96
SB-124	Not Detected	--------	2.63E-02
SB-125	Not Detected	--------	6.50E-02
SC-46	Not Detected	--------	4.15E-02
SR-85	Not Detected	--------	3.12E-02
TA-182	Not Detected	--------	1.20E-01
TA-183	Not Detected	--------	8.87E-01
TE-132	Not Detected	--------	8.04E-02
TL-201	Not Detected	--------	5.09E-01
V-48	Not Detected	--------	3.40E-02
XE-133	Not Detected	--------	6.99E-01
Y-88	Not Detected	--------	2.36E-02
ZN-65	Not Detected	--------	7.94E-02
ZR-95	Not Detected	--------	4.66E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-19-96 5:40:21 PM *
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* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027935-02
Lab Sample ID : 60020310

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 672.000 gram
Sample Date/Time : 3-13-96 1:23:00 PM
Acquire Start Date : 3-19-96 3:51:34 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.33
TH-234	1.18	4.03E-01	4.11E-01
RA-226	1.65	4.90E-01	5.82E-01
PB-214	6.53E-01	1.43E-01	7.79E-02
BI-214	6.26E-01	1.19E-01	8.56E-02
TH-232	9.76E-01	4.72E-01	1.78E-01
RA-228	1.04	2.34E-01	1.50E-01
AC-228	9.42E-01	1.86E-01	1.27E-01
TH-228	8.46E-01	5.49E-01	8.16E-01
RA-224	1.04	2.83E-01	8.77E-02
PB-212	1.00	2.17E-01	3.89E-02
BI-212	1.34	3.86E-01	4.43E-01
TL-208	9.99E-01	1.80E-01	1.11E-01
U-235	Not Detected	--------	1.83E-01
TH-231	Not Detected	--------	1.60
PA-231	Not Detected	--------	1.35
TH-227	Not Detected	--------	4.06E-01
RA-223	Not Detected	--------	1.62E-01
RN-219	Not Detected	--------	3.98E-01
PB-211	Not Detected	--------	9.19E-01
TL-207	Not Detected	--------	1.55E+01
AM-241	Not Detected	--------	1.66E-01
PU-239	Not Detected	--------	3.38E+02
NP-237	Not Detected	--------	2.45E-01
PA-233	Not Detected	--------	5.83E-02
TH-229	Not Detected	--------	1.79E-01

[Summary Report] - Sample ID: 60020310

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	3.61E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.09E-02
BA-140	Not Detected	--------	1.58E-01
CD-109	Not Detected	--------	6.51E-01
CD-115	Not Detected	--------	4.92E-01
CE-139	Not Detected	--------	2.67E-02
CE-141	Not Detected	--------	4.77E-02
CE-144	Not Detected	--------	1.75E-01
CO-56	Not Detected	--------	3.76E-02
CO-57	Not Detected	--------	2.19E-02
CO-58	Not Detected	--------	3.78E-02
CO-60	Not Detected	--------	4.43E-02
CR-51	Not Detected	--------	2.65E-01
CS-134	Not Detected	--------	5.82E-02
CS-137	Not Detected	--------	4.15E-02
CU-64	Not Detected	--------	2.71E+04
EU-152	Not Detected	--------	2.61E-01
EU-154	Not Detected	--------	1.90E-01
EU-155	Not Detected	--------	9.14E-02
FE-59	Not Detected	--------	8.53E-02
GD-153	Not Detected	--------	6.93E-02
HG-203	Not Detected	--------	3.22E-02
I-131	Not Detected	--------	4.99E-02
IN-115m	Not Detected	--------	5.63E+08
IR-192	Not Detected	--------	2.94E-02
K-40	1.41E+01	2.00	4.03E-01
LA-140	Not Detected	--------	5.49E-01
MN-54	Not Detected	--------	3.86E-02
MN-56	Not Detected	--------	5.57E+15
MO-99	Not Detected	--------	1.25
NA-22	Not Detected	--------	4.60E-02
NA-24	Not Detected	--------	3.27E+01
NB-95	Not Detected	--------	6.12E-01
ND-147	Not Detected	--------	2.93E-01
NI-57	Not Detected	--------	9.21E-01
BE-07	Not Detected	--------	2.81E-01
RU-103	Not Detected	--------	3.31E-02
RU-106	Not Detected	--------	3.25E-01
SB-122	Not Detected	--------	2.03E-01
SB-124	Not Detected	--------	3.98E-02
SB-125	Not Detected	--------	8.64E-02
SC-46	Not Detected	--------	5.87E-02
SR-85	Not Detected	--------	4.54E-02
TA-182	Not Detected	--------	1.73E-01
TA-183	Not Detected	--------	3.26E-01
TE-132	Not Detected	--------	9.35E-02
TL-201	Not Detected	--------	3.22E-01
V-48	Not Detected	--------	5.43E-02
XE-133	Not Detected	--------	4.92E-01
Y-88	Not Detected	--------	3.06E-02
ZN-65	Not Detected	--------	1.11E-01
ZR-95	Not Detected	--------	7.13E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-20-96 10:01:29 AM *
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* *
* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027936-02
Lab Sample ID : 60020311

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 903.000 gram
Sample Date/Time : 3-13-96 1:38:00 PM
Acquire Start Date : 3-20-96 8:17:32 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.97
TH-234	7.54E-01	2.96E-01	5.11E-01
RA-226	1.10	3.75E-01	4.56E-01
PB-214	4.61E-01	7.86E-02	5.43E-02
BI-214	4.25E-01	8.65E-02	8.67E-02
TH-232	7.13E-01	3.35E-01	1.63E-01
RA-228	8.02E-01	1.78E-01	1.20E-01
AC-228	8.35E-01	1.53E-01	9.28E-02
TH-228	8.56E-01	2.55E-01	4.13E-01
RA-224	8.61E-01	2.14E-01	8.00E-02
PB-212	8.39E-01	1.47E-01	3.57E-02
BI-212	9.05E-01	2.43E-01	2.74E-01
TL-208	7.85E-01	1.27E-01	8.10E-02
U-235	Not Detected	--------	2.02E-01
TH-231	Not Detected	--------	2.40
PA-231	Not Detected	--------	1.24
TH-227	Not Detected	--------	3.28E-01
RA-223	Not Detected	--------	2.35E-01
RN-219	Not Detected	--------	3.29E-01
PB-211	Not Detected	--------	7.76E-01
TL-207	Not Detected	--------	1.16E+01
AM-241	Not Detected	--------	4.68E-01
PU-239	Not Detected	--------	4.76E+02
NP-237	Not Detected	--------	2.40E-01
PA-233	Not Detected	--------	5.09E-02
TH-229	Not Detected	--------	2.50E-01

[Summary Report] - Sample ID: 60020311

Nuclide	Activity (pCi/gram)	2S Error	MDA	
AG-110m	Not Detected	--------	2.71E-02	
AR-41	Not Detected	--------	1.00E+26	
BA-133	Not Detected	--------	5.14E-02	
BA-140	Not Detected	--------	1.26E-01	
CD-109	Not Detected	--------	8.33E-01	
CD-115	Not Detected	--------	4.66E-01	
CE-139	Not Detected	--------	2.61E-02	
CE-141	Not Detected	--------	5.26E-02	
CE-144	Not Detected	--------	2.11E-01	
CO-56	~~1.29E-02~~	~~1.03E-02~~	1.89E-02	Not detected 3/21/96
CO-57	Not Detected	--------	2.84E-02	
CO-58	Not Detected	--------	2.78E-02	
CO-60	Not Detected	--------	3.03E-02	
CR-51	Not Detected	--------	2.31E-01	
CS-134	Not Detected	--------	4.11E-02	
CS-137	Not Detected	--------	3.00E-02	
CU-64	Not Detected	--------	4.70E+04	
EU-152	Not Detected	--------	2.10E-01	
EU-154	Not Detected	--------	1.56E-01	
EU-155	Not Detected	--------	1.23E-01	
FE-59	Not Detected	--------	6.86E-02	
GD-153	Not Detected	--------	1.01E-01	
HG-203	Not Detected	--------	2.76E-02	
I-131	Not Detected	--------	4.18E-02	
IN-115m	Not Detected	--------	5.28E+09	
IR-192	Not Detected	--------	2.51E-02	
K-40	1.73E+01	2.34	3.49E-01	
LA-140	Not Detected	--------	5.24E-01	
MN-54	Not Detected	--------	1.56E-02	
MN-56	Not Detected	--------	3.59E+17	
MO-99	Not Detected	--------	1.18	
NA-22	Not Detected	--------	3.55E-02	
NA-24	Not Detected	--------	5.15E+01	
NB-95	Not Detected	--------	5.60E-01	
ND-147	Not Detected	--------	2.52E-01	
NI-57	Not Detected	--------	9.46E-01	
BE-07	Not Detected	--------	2.19E-01	
RU-103	Not Detected	--------	2.61E-02	
RU-106	Not Detected	--------	2.41E-01	
SB-122	~~4.99E-02~~	~~6.55E-02~~	1.06E-01	Not detected 3/21/96
SB-124	Not Detected	--------	2.84E-02	
SB-125	Not Detected	--------	7.20E-02	
SC-46	Not Detected	--------	4.51E-02	
SR-85	Not Detected	--------	3.35E-02	
TA-182	Not Detected	--------	1.30E-01	
TA-183	Not Detected	--------	1.03	
TE-132	Not Detected	--------	1.01E-01	
TL-201	Not Detected	--------	6.48E-01	
V-48	Not Detected	--------	3.92E-02	
XE-133	Not Detected	--------	9.31E-01	
Y-88	Not Detected	--------	2.18E-02	
ZN-65	Not Detected	--------	8.73E-02	
ZR-95	Not Detected	--------	5.21E-02	

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-20-96 10:35:55 AM *
****
* *
* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027937-02
Lab Sample ID : 60020312

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 830.000 gram
Sample Date/Time : 3-13-96 1:41:00 PM
Acquire Start Date : 3-20-96 8:21:21 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	5.41E-01	6.04E-01	9.49E-01
TH-234	9.89E-01	2.66E-01	3.56E-01
RA-226	1.09	5.20E-01	7.58E-01
PB-214	6.53E-01	1.40E-01	6.93E-02
BI-214	5.73E-01	1.06E-01	6.76E-02
TH-232	7.15E-01	3.71E-01	2.56E-01
RA-228	7.96E-01	2.67E-01	1.63E-01
AC-228	9.07E-01	1.73E-01	1.09E-01
TH-228	9.03E-01	3.80E-01	4.31E-01
RA-224	7.79E-01	2.19E-01	9.93E-02
PB-212	8.60E-01	1.85E-01	3.42E-02
BI-212	8.22E-01	3.02E-01	3.97E-01
TL-208	8.09E-01	1.46E-01	8.97E-02
U-235	~~8.56E-02~~	~~1.18E-01~~	1.65E-01 Not detected 3/21/96
TH-231	Not Detected	--------	1.41
PA-231	Not Detected	--------	1.21
TH-227	Not Detected	--------	3.46E-01
RA-223	Not Detected	--------	1.49E-01
RN-219	Not Detected	--------	3.55E-01
PB-211	Not Detected	--------	8.01E-01
TL-207	Not Detected	--------	1.31E+01
AM-241	Not Detected	--------	1.42E-01
PU-239	Not Detected	--------	3.04E+02
NP-237	Not Detected	--------	1.71E-01
PA-233	Not Detected	--------	5.36E-02
TH-229	Not Detected	--------	1.66E-01

[Summary Report] - Sample ID: 60020312

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.38E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.30E-02
BA-140	Not Detected	--------	1.46E-01
CD-109	Not Detected	--------	5.93E-01
CD-115	Not Detected	--------	5.25E-01
CE-139	Not Detected	--------	2.41E-02
CE-141	Not Detected	--------	4.28E-02
CE-144	Not Detected	--------	1.62E-01
CO-56	Not Detected	--------	3.41E-02
CO-57	Not Detected	--------	2.11E-02
CO-58	Not Detected	--------	3.43E-02
CO-60	Not Detected	--------	3.77E-02
CR-51	Not Detected	--------	2.51E-01
CS-134	Not Detected	--------	5.01E-02
CS-137	1.23E-01	3.07E-02	3.40E-02
CU-64	Not Detected	--------	5.57E+04
EU-152	Not Detected	--------	2.32E-01
EU-154	Not Detected	--------	1.78E-01
EU-155	Not Detected	--------	8.36E-02
FE-59	Not Detected	--------	8.15E-02
GD-153	Not Detected	--------	6.29E-02
HG-203	Not Detected	--------	2.82E-02
I-131	Not Detected	--------	4.73E-02
IN-115m	Not Detected	--------	5.96E+09
IR-192	Not Detected	--------	2.67E-02
K-40	1.76E+01	2.43	3.58E-01
LA-140	Not Detected	--------	6.44E-01
MN-54	Not Detected	--------	1.11E-02
MN-56	Not Detected	--------	3.91E+17
MO-99	Not Detected	--------	1.39
NA-22	Not Detected	--------	4.29E-02
NA-24	Not Detected	--------	6.42E+01
NB-95	Not Detected	--------	5.94E-01
ND-147	Not Detected	--------	2.88E-01
NI-57	Not Detected	--------	1.14
BE-07	Not Detected	--------	2.59E-01
RU-103	Not Detected	--------	2.99E-02
RU-106	Not Detected	--------	2.88E-01
SB-122	Not Detected	--------	2.32E-01
SB-124	Not Detected	--------	3.34E-02
SB-125	Not Detected	--------	7.83E-02
SC-46	Not Detected	--------	5.62E-02
SR-85	Not Detected	--------	3.83E-02
TA-182	Not Detected	--------	1.65E-01
TA-183	Not Detected	--------	3.05E-01
TE-132	Not Detected	--------	9.58E-02
TL-201	Not Detected	--------	3.25E-01
V-48	Not Detected	--------	4.69E-02
XE-133	Not Detected	--------	5.42E-01
Y-88	Not Detected	--------	2.52E-02
ZN-65	Not Detected	--------	1.07E-01
ZR-95	Not Detected	--------	5.90E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-20-96 12:10:57 PM *
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* *
* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *
****

Customer : M. YOUNG (7585)
Customer Sample ID : 027939-02
Lab Sample ID : 60020313

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 844.000 gram
Sample Date/Time : 3-13-96 1:45:00 PM
Acquire Start Date : 3-20-96 10:26:54 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.85
TH-234	9.23E-01	3.27E-01	5.06E-01
RA-226	9.15E-01	4.04E-01	5.90E-01
PB-214	4.28E-01	8.23E-02	7.65E-02
BI-214	3.64E-01	6.81E-02	5.55E-02
TH-232	6.92E-01	3.26E-01	1.60E-01
RA-228	8.14E-01	1.80E-01	1.19E-01
AC-228	7.64E-01	1.48E-01	1.08E-01
TH-228	7.56E-01	2.64E-01	4.03E-01
RA-224	6.83E-01	1.77E-01	8.21E-02
PB-212	7.17E-01	1.21E-01	3.75E-02
BI-212	8.34E-01	3.08E-01	4.21E-01
TL-208	6.49E-01	1.11E-01	7.96E-02
U-235	Not Detected	--------	2.02E-01
TH-231	Not Detected	--------	2.25
PA-231	Not Detected	--------	1.25
TH-227	Not Detected	--------	3.24E-01
RA-223	Not Detected	--------	2.26E-01
RN-219	Not Detected	--------	3.26E-01
PB-211	Not Detected	--------	7.83E-01
TL-207	Not Detected	--------	1.18E+01
AM-241	Not Detected	--------	4.63E-01
PU-239	Not Detected	--------	3.89E+02
NP-237	Not Detected	--------	2.37E-01
PA-233	Not Detected	--------	4.98E-02
TH-229	Not Detected	--------	2.40E-01

[Summary Report] - Sample ID: 60020313

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	2.58E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.13E-02
BA-140	Not Detected	--------	1.25E-01
CD-109	Not Detected	--------	8.24E-01
CD-115	Not Detected	--------	4.85E-01
CE-139	Not Detected	--------	2.62E-02
CE-141	Not Detected	--------	5.24E-02
CE-144	Not Detected	--------	2.08E-01
CO-56	~~1.73E 02~~	~~1.17E 02~~	1.86E-02 Not detected 3/21/96
CO-57	Not Detected	--------	2.79E-02
CO-58	Not Detected	--------	2.76E-02
CO-60	Not Detected	--------	3.10E-02
CR-51	Not Detected	--------	2.33E-01
CS-134	Not Detected	--------	4.08E-02
CS-137	Not Detected	--------	3.01E-02
CU-64	Not Detected	--------	5.30E+04
EU-152	Not Detected	--------	2.05E-01
EU-154	Not Detected	--------	1.57E-01
EU-155	Not Detected	--------	1.18E-01
FE-59	Not Detected	--------	6.39E-02
GD-153	Not Detected	--------	9.68E-02
HG-203	Not Detected	--------	2.71E-02
I-131	Not Detected	--------	4.22E-02
IN-115m	Not Detected	--------	7.32E+09
IR-192	Not Detected	--------	2.52E-02
K-40	1.50E+01	2.06	3.77E-01
LA-140	Not Detected	--------	5.32E-01
MN-54	Not Detected	--------	1.71E-02
MN-56	Not Detected	--------	5.95E+17
MO-99	Not Detected	--------	1.13
NA-22	Not Detected	--------	3.44E-02
NA-24	Not Detected	--------	5.73E+01
NB-95	Not Detected	--------	5.61E-01
ND-147	Not Detected	--------	2.54E-01
NI-57	Not Detected	--------	9.88E-01
BE-07	Not Detected	--------	2.17E-01
RU-103	Not Detected	--------	2.56E-02
RU-106	Not Detected	--------	2.45E-01
SB-122	Not Detected	--------	1.96E-01
SB-124	Not Detected	--------	2.86E-02
SB-125	Not Detected	--------	7.00E-02
SC-46	Not Detected	--------	4.56E-02
SR-85	Not Detected	--------	3.27E-02
TA-182	Not Detected	--------	1.33E-01
TA-183	Not Detected	--------	1.01
TE-132	Not Detected	--------	1.03E-01
TL-201	Not Detected	--------	6.54E-01
V-48	Not Detected	--------	3.92E-02
XE-133	Not Detected	--------	9.07E-01
Y-88	Not Detected	--------	2.13E-02
ZN-65	Not Detected	--------	8.78E-02
ZR-95	Not Detected	--------	5.21E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-20-96 12:07:41 PM *
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* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *
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Customer : M. YOUNG (7585)
Customer Sample ID : 027973-02
Lab Sample ID : 60020314

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 720.000 gram
Sample Date/Time : 3-13-96 1:52:00 PM
Acquire Start Date : 3-20-96 10:24:03 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	6.23E-01	4.67E-01	6.91E-01
TH-234	8.53E-01	2.51E-01	3.30E-01
RA-226	1.34	5.55E-01	7.81E-01
PB-214	5.57E-01	1.24E-01	7.43E-02
BI-214	4.80E-01	9.23E-02	6.28E-02
TH-232	7.15E-01	3.72E-01	2.57E-01
RA-228	7.96E-01	2.09E-01	1.48E-01
AC-228	6.66E-01	1.42E-01	1.09E-01
TH-228	5.78E-01	2.78E-01	3.67E-01
RA-224	7.98E-01	2.25E-01	8.80E-02
PB-212	7.42E-01	1.62E-01	3.55E-02
BI-212	9.27E-01	4.07E-01	5.76E-01
TL-208	7.08E-01	1.34E-01	8.95E-02
U-235	Not Detected	--------	1.63E-01
TH-231	Not Detected	--------	1.42
PA-231	Not Detected	--------	1.24
TH-227	Not Detected	--------	3.50E-01
RA-223	Not Detected	--------	1.47E-01
RN-219	Not Detected	--------	3.58E-01
PB-211	Not Detected	--------	8.06E-01
TL-207	Not Detected	--------	1.43E+01
AM-241	Not Detected	--------	1.35E-01
PU-239	Not Detected	--------	2.95E+02
NP-237	Not Detected	--------	1.58E-01
PA-233	Not Detected	--------	5.33E-02
TH-229	Not Detected	--------	1.58E-01

[Summary Report] - Sample ID: 60020314

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.06E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.38E-02
BA-140	Not Detected	--------	1.55E-01
CD-109	Not Detected	--------	5.47E-01
CD-115	Not Detected	--------	5.44E-01
CE-139	Not Detected	--------	2.35E-02
CE-141	Not Detected	--------	4.32E-02
CE-144	Not Detected	--------	1.58E-01
CO-56	Not Detected	--------	3.43E-02
CO-57	Not Detected	--------	2.00E-02
CO-58	Not Detected	--------	3.13E-02
CO-60	Not Detected	--------	3.34E-02
CR-51	Not Detected	--------	2.45E-01
CS-134	Not Detected	--------	5.12E-02
CS-137	8.51E-02	2.59E-02	3.13E-02
CU-64	Not Detected	--------	6.17E+04
EU-152	Not Detected	--------	2.39E-01
EU-154	Not Detected	--------	1.73E-01
EU-155	Not Detected	--------	8.08E-02
FE-59	Not Detected	--------	7.93E-02
GD-153	Not Detected	--------	6.28E-02
HG-203	Not Detected	--------	2.90E-02
I-131	Not Detected	--------	4.92E-02
IN-115m	Not Detected	--------	8.03E+09
IR-192	Not Detected	--------	2.70E-02
K-40	1.27E+01	1.81	3.33E-01
LA-140	Not Detected	--------	6.69E-01
MN-54	Not Detected	--------	3.53E-02
MN-56	Not Detected	--------	6.48E+17
MO-99	Not Detected	--------	1.34
NA-22	Not Detected	--------	4.15E-02
NA-24	Not Detected	--------	6.92E+01
NB-95	Not Detected	--------	6.09E-01
ND-147	Not Detected	--------	2.97E-01
NI-57	Not Detected	--------	1.24
BE-07	Not Detected	--------	2.51E-01
RU-103	Not Detected	--------	3.00E-02
RU-106	Not Detected	--------	3.00E-01
SB-122	Not Detected	--------	2.32E-01
SB-124	Not Detected	--------	3.44E-02
SB-125	Not Detected	--------	7.63E-02
SC-46	Not Detected	--------	5.88E-02
SR-85	Not Detected	--------	3.97E-02
TA-182	Not Detected	--------	1.69E-01
TA-183	Not Detected	--------	2.94E-01
TE-132	Not Detected	--------	9.71E-02
TL-201	Not Detected	--------	3.23E-01
V-48	Not Detected	--------	4.77E-02
XE-133	Not Detected	--------	5.61E-01
Y-88	Not Detected	--------	2.72E-02
ZN-65	Not Detected	--------	1.07E-01
ZR-95	Not Detected	--------	6.44E-02

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-20-96 2:14:34 PM
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Analyzed by: 3/21/96 Reviewed by: 3/21/96

Customer : M. YOUNG (7585)
Customer Sample ID : 027974-12
Lab Sample ID : 60020315

Sample Description : MARINELLI LIQUID SAMPLE
Sample Type : Liquid
Sample Geometry : 2WMAR
Sample Quantity : 500.000 mL
Sample Date/Time : 3-13-96 2:15:00 PM
Acquire Start Date : 3-20-96 12:30:36 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6001 seconds

Comments:

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Nuclide	Activity (pCi/mL)	2S Error	MDA
U-238	Not Detected	--------	1.68
TH-234	Not Detected	--------	4.00E-01
RA-226	Not Detected	--------	4.62E-01
PB-214	Not Detected	--------	4.10E-02
BI-214	Not Detected	--------	4.84E-02
TH-232	Not Detected	--------	1.35E-01
RA-228	Not Detected	--------	1.39E-01
AC-228	Not Detected	--------	7.82E-02
TH-228	Not Detected	--------	4.25E-01
RA-224	Not Detected	--------	1.03E-01
PB-212	Not Detected	--------	3.46E-02
BI-212	Not Detected	--------	3.03E-01
TL-208	Not Detected	--------	5.98E-02
U-235	Not Detected	--------	1.47E-01
TH-231	Not Detected	--------	1.34
PA-231	Not Detected	--------	9.02E-01
TH-227	Not Detected	--------	1.36E-01
RA-223	Not Detected	--------	1.35E-01
RN-219	Not Detected	--------	2.59E-01
PB-211	Not Detected	--------	5.64E-01
TL-207	Not Detected	--------	8.36
AM-241	Not Detected	--------	3.01E-01
PU-239	Not Detected	--------	2.68E+02
NP-237	Not Detected	--------	1.80E-01
PA-233	Not Detected	--------	3.73E-02
TH-229	Not Detected	--------	1.62E-01

[Summary Report] - Sample ID: 60020315

Nuclide	Activity (pCi/mL)	2S Error	MDA
AG-110m	Not Detected	--------	2.00E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	2.40E-02
BA-140	Not Detected	--------	9.60E-02
CD-109	Not Detected	--------	6.24E-01
CD-115	Not Detected	--------	2.89E-01
CE-139	Not Detected	--------	1.96E-02
CE-141	Not Detected	--------	3.80E-02
CE-144	~~6.02E-02~~	~~2.70E-01~~	~~5.84E-02~~ Not detected 3/21/96
CO-56	Not Detected	--------	2.81E-02
CO-57	Not Detected	--------	2.04E-02
CO-58	Not Detected	--------	2.16E-02
CO-60	Not Detected	--------	2.51E-02
CR-51	Not Detected	--------	1.59E-01
CS-134	Not Detected	--------	2.32E-02
CS-137	Not Detected	--------	2.15E-02
CU-64	Not Detected	--------	4.74E+04
EU-152	Not Detected	--------	1.80E-01
EU-154	Not Detected	--------	1.03E-01
EU-155	Not Detected	--------	7.92E-02
FE-59	Not Detected	--------	4.64E-02
GD-153	Not Detected	--------	6.26E-02
HG-203	Not Detected	--------	1.97E-02
I-131	Not Detected	--------	3.52E-02
IN-115m	Not Detected	--------	5.45E+09
IR-192	Not Detected	--------	1.81E-02
K-40	Not Detected	--------	3.14E-01
LA-140	Not Detected	--------	4.49E-01
MN-54	Not Detected	--------	2.20E-02
MN-56	Not Detected	--------	8.45E+17
MO-99	Not Detected	--------	9.67E-01
NA-22	Not Detected	--------	2.31E-02
NA-24	Not Detected	--------	4.98E+01
NB-95	Not Detected	--------	2.40E-01
ND-147	Not Detected	--------	1.90E-01
NI-57	Not Detected	--------	8.01E-01
BE-07	Not Detected	--------	1.70E-01
RU-103	Not Detected	--------	2.13E-02
RU-106	Not Detected	--------	1.97E-01
SB-122	Not Detected	--------	1.52E-01
SB-124	Not Detected	--------	2.44E-02
SB-125	Not Detected	--------	5.19E-02
SC-46	Not Detected	--------	2.36E-02
SR-85	Not Detected	--------	3.01E-02
TA-182	Not Detected	--------	6.63E-02
TA-183	Not Detected	--------	6.82E-01
TE-132	Not Detected	--------	7.21E-02
TL-201	Not Detected	--------	3.53E-01
V-48	Not Detected	--------	2.68E-02
XE-133	Not Detected	--------	5.54E-01
Y-88	Not Detected	--------	2.79E-02
ZN-65	Not Detected	--------	4.29E-02
ZR-95	Not Detected	--------	3.81E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-20-96 12:44:49 PM
*
* Analyzed by: 3/20/96 Reviewed by: 3/21/96
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Customer : M. YOUNG (7585)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60020317

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 3-20-96 12:32:06 PM
Detector Name : LAB03
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Comments:

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Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	6.36E+03
TH-234	Not Detected	--------	2.74E+03
RA-226	Not Detected	--------	5.68E+03
PB-214	Not Detected	--------	7.28E+02
BI-214	Not Detected	--------	7.32E+02
TH-232	Not Detected	--------	2.12E+03
RA-228	Not Detected	--------	3.30E+03
AC-228	Not Detected	--------	1.93E+03
TH-228	Not Detected	--------	4.48E+04
RA-224	Not Detected	--------	2.41E+03
PB-212	Not Detected	--------	3.39E+03
BI-212	Not Detected	--------	3.68E+04
TL-208	Not Detected	--------	6.85E+03
U-235	Not Detected	--------	1.47E+03
TH-231	Not Detected	--------	8.89E+03
PA-231	Not Detected	--------	1.31E+04
TH-227	Not Detected	--------	2.30E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.67E+03
PB-211	Not Detected	--------	1.26E+04
TL-207	Not Detected	--------	2.55E+05
AM-241	8.97E+04	1.41E+04	1.97E+03
PU-239	Not Detected	--------	2.60E+06
NP-237	Not Detected	--------	1.50E+03
PA-233	Not Detected	--------	6.17E+02
TH-229	Not Detected	--------	1.28E+03

[Summary Report] - Sample ID: 60020317

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	--------	4.10E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.24E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.23E+05	7.69E+04	8.08E+04
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	4.09E+06
CE-141	Not Detected	--------	5.28E+20
CE-144	Not Detected	--------	1.72E+05
CO-56	Not Detected	--------	2.17E+10
CO-57	Not Detected	--------	2.86E+04
CO-58	Not Detected	--------	9.51E+10
CO-60	7.48E+04	9.80E+03	6.37E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	2.07E+03
CS-137	6.74E+04	8.77E+03	7.42E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	4.02E+03
EU-154	Not Detected	--------	2.65E+03
EU-155	Not Detected	--------	1.48E+03
FE-59	Not Detected	--------	2.03E+16
GD-153	Not Detected	--------	1.36E+05
HG-203	Not Detected	--------	1.31E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.98E+10
K-40	Not Detected	--------	1.76E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.44E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	1.08E+03
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	4.51E+14
RU-103	Not Detected	--------	4.25E+17
RU-106	Not Detected	--------	1.35E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	2.29E+12
SB-125	Not Detected	--------	4.35E+03
SC-46	Not Detected	--------	5.79E+09
SR-85	Not Detected	--------	5.01E+11
TA-182	Not Detected	--------	2.01E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	6.54E+07
ZN-65	Not Detected	--------	2.84E+05
ZR-95	Not Detected	--------	1.16E+12

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report

Report Date : 3-20-96 12:48:37 PM
QA File : C:\GENIEPC\CAMFILES\LCS3.QAF
Analyst : FCD
Sample ID : 60020317
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 3-20-96 12:32:06 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
AM-241 Activity	8.572E-02	1.457E-02	8.967E-02	<	:	:	: >
CS-137 Activity	6.701E-02	5.510E-04	6.744E-02	<	:	:	: >
CO-60 Activity	7.431E-02	6.354E-04	7.471E-02	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 3/21/96

Feature 58J

Supersedes (5-97) issue

Internal Lab Batch No. 801850

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SAR/WR No.

AR/COC- 600804

Dept. No./Mail Stop: **6134/MS-1148**
Project/Task Manager: **Caroline Byrd**
Project Name: **Site 58 foothills RFI Field**
Record Center Code: **ER/1333/58/Dat**
Logbook Ref. No.:
Service Order No.:**CFO535**

Date Samples Shipped: 9/8/98 SMO USE
Carrier/Waybill No.: HC
Lab Contact: **Fernando Dominguez**
Lab Destination: **881**
SMO Contact/Phone: **Doug Salmi 844-3110**
Send Report to SMO: **S. Montano/844-3110**

Contract No.:
Case No.: **7213.130**
SMO Authorization
Bill to: Sandia National Laboratories
Supplier Services, Dept.
P.O. Box 5800 MS 0154

Location Tech Area N/A
Building N/A Room N/A

Sample No. – Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested	LAB USE Lab Sample ID
042622-002	S58J-GR-135-0-SS	0	58J	9/8/98 1018	S	M	500ml	4C	Gr	SA	GAMMA SPEC	
042623-002	S58J-GR-136-0-SS			9/8/98 1023								
042624-002	S58J-GR-137-0-SS			9/8/98 1029								
042625-002	S58J-GR-138-0-SS			9/8/98 1030								
042627-002	S58J-GR-140-0-SS			9/8/98 1041								
042628-002	S58J-GR-141-0-SS			9/8/98 1044								
042629-002	S58J-GR-142-0-SS			9/8/98 1045								
042630-002	S58J-GR-143-0-SS			9/8/98 1046								
042632-002	S58L-GR-145-0-SS		58L	9/8/98 1116								
042633-002	S58L-GR-146-0-SS			9/8/98 1117								

Reference LOV (available at SMO)

RMMA ☐Yes ☒No Ref. No.

Sample Disposal ☐Return to Client ☒Disposal by lab

Sample Tracking SMO USE
Date Entered (mm/dd/yy)
Entered by:

Turnaround Time ☒Normal ☐Rush Required Report Date

QC inits.

Special Instructions/QC Requirements
EDD ☒Yes ☐No
Raw data package ☒Yes ☐No
Sent copy to Ed Mignardot

Abnormal Conditions on Receipt LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phon
	John Boyd		JB	IT/6131 /
	Gill Baltazar		GB	Weston/6131 /971-2769

1. Relinquished by	Org. IT 6134	Date 9-8-98	Time 1451	4. Relinquished by	Org.	Date	
1. Received by	Org. 7577	Date 9-8-98	Time 1451	4. Received by	Org.	Date	
2. Relinquished by	Org. 7577	Date 9-8-98	Time 1520	5. Relinquished by	Org.	Date	
2. Received by	Org. 7578	Date 9/8/98	Time 1520	5. Received by	Org.	Date	
3. Relinquished by	Org. SNL7578	Date 9/11/98	Time 1105	6. Relinquished by	Org.	Date	
3. Received by	Org. 7577	Date 9/14/98	Time 1105	6. Received by	Org.	Date	

Original To Accompany Samples, Laboratory Copy (White) **1st Copy** To Accompany Samples, Return to SMO (Blue) **2nd Copy** SMO Suspense Copy (Yellow) **3rd Copy** Field Copy (Pink)

= 2001-COC (10-97)
upersedes (5-97) Issue

BATCH #801850

ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Press F1 for instructions for each field.

AR/COC- 600804

roject Name: Site 58 foothills RFI Field | Project/Task Manager: Caroline Byrd | Case No.: 7213.130

Location | Tech Area N/A

uilding N/A | Room N/A

Reference LOV (available at SMO)

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested	LAB USE Lab Sample ID
042634-002	S58L-GR-147-0-SS	0	58L	9/8/98 1125	S	M	500ml	4C	GR	SA	GAMMA SPEC	
042635-002	S58L-GR-148-0-SS			9/8/98 1126								
042638-002	S58L-GR-151-0-SS			9/8/98 1140								
042639-002	S58L-GR-152-0-SS			9/8/98 1143								
042636-002	S58L-GR-149-0-SS		58L	9/8/98 1134								
042637-002	S58L-GR-150-0-SS		58L	9/8/98 1137								
042626-002	S58J-GR-139-0-SS		58J	9/8/98 1032								
042631-002	S58L-GR-144-0-SS		58L	9/8/98 1114								

Abnormal Conditions on Receipt | **LAB USE**

Recipient Initials _____

Original To Accompany Samples, Laboratory Copy (White) | **1st Copy** To Accompany Samples, Return to SMO (Blue) | **2nd Copy** SMO Suspense Copy (Yellow) | **3rd Copy** Field Copy (Pink)

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134
Project Location: ER/1333/58/out
Phone: 284-3308
Date Results Needed: Normal
Suspect Isotopes:
Case Number: 7213.130

Hazards/Special Instructions:
Need EDD & Raw Data Package
Send copy of results to Ed Hignardot

Batch Log Number: 801850
Logged By: KM

Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass	Remarks / Aliquot Amount
042622-002	S	9/8/98 1018	500ml	Gamma Spec	01	<300	597g	
623		1023			02		552g	
624		1029			03		901g	
625		1030			04		790g	
627		1041			05		764g	
628		1044			06		673g	
629		1045			07		597g	
630		1046			08		455g	
632		1116			09		665g	
633		1117			10		917g	
634		1125			11		655g	
635		1126			12		797g	
638		1140			13		499g	

Relinquished by	[signature]	Date 9-8-98	Received by	[signature]	Date 9/8/98
Relinquished by	[signature]	Date 9/11/98	Received by	[signature]	Date 9/11/98
Relinquished by		Date	Received by		Date
Relinquished by		Date	Received by		Date

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer : Caroline Byrd
Organization: 6134
Project Location: ER/1333/58/Dat
Phone: 284-3308
Date Results Needed: Normal
Suspect Isotopes:
Case Number: 7213.130

Hazards/Special Instructions:

see page 1

Batch Log Number: 801850
Logged By: KA

Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass	Remarks / Aliquot Amount
042639-002	S	9/8/96 1143	500ml	Gamma Spec	14	<300	770g	
636	↓	1134	↓	↓	15	↓	816g	
637	↓	1137	↓	↓	16	↓	683g	
626	↓	1032	↓	↓	17	↓	719g	
631	↓	1114	↓	↓	18	↓	853g	
LCS	—	—	—	—	19	—	—	

Relinquished by [signature] Date 9-8-98 Received by [signature] Date 9/8/98
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____

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Sandia National Laboratories
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*
Radiation Protection Sample Diagnostics Program [806 Laboratory]
*
*
9-08-98 6:09:06 PM
*
****
*
*
* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
****

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042622-002
Lab Sample ID : 80185001

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 597.000 gram
Sample Date/Time : 9-08-98 10:18:00 AM
Acquire Start Date/Time : 9-08-98 4:26:18 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.17E-01	4.99E-01	7.11E-01
RA-226	1.59E+00	3.03E+00	6.74E-01
PB-214	6.31E-01	6.99E-01	5.90E-02
BI-214	5.71E-01	1.24E-01	4.86E-02
PB-210	Not Detected	---	4.33E+01
TH-232	8.16E-01	4.44E-01	1.72E-01
RA-228	8.58E-01	2.61E-01	1.43E-01
AC-228	8.55E-01	2.80E-01	3.03E-01
TH-228	6.91E-01	2.84E-01	6.18E-01
RA-224	7.99E-01	2.85E-01	7.58E-02
PB-212	8.50E-01	1.42E-01	4.64E-02
BI-212	9.56E-01	2.67E-01	3.23E-01
TL-208	7.01E-01	1.62E-01	7.96E-02
U-235	Not Detected	---	2.73E-01
TH-231	Not Detected	---	2.64E+00
PA-231	Not Detected	---	4.57E+00
TH-227	Not Detected	---	4.10E-01
RA-223	Not Detected	---	2.35E-01
RN-219	Not Detected	---	4.72E-01
PB-211	Not Detected	---	1.08E+00
TL-207	Not Detected	---	1.57E+01
AM-241	Not Detected	---	5.45E-01
PU-239	Not Detected	---	5.21E+02
NP-237	~~4.57E-01~~	~~2.43E-01~~	4.01E-01 Not detected 9/10/98
PA-233	Not Detected	---	6.82E-02
TH-229	Not Detected	---	3.01E-01

[Summary Report] - Sample ID: : 80185001

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.48E-02
AG-110m	Not Detected	---------	1.11E-01
BA-133	Not Detected	---------	7.61E-02
BE-7	1.86E-01	1.68E-01	2.18E-01
CD-109	Not Detected	---------	1.36E+00
CD-115	Not Detected	---------	8.45E-02
CE-139	Not Detected	---------	3.34E-02
CE-141	Not Detected	---------	6.17E-02
CE-144	Not Detected	---------	2.83E-01
CO-56	Not Detected	---------	3.60E-02
CO-57	Not Detected	---------	3.47E-02
CO-58	Not Detected	---------	3.48E-02
CO-60	Not Detected	---------	3.72E-02
CR-51	Not Detected	---------	2.85E-01
CS-134	Not Detected	---------	5.24E-02
CS-137	1.35E+00	2.41E-01	2.71E-02
EU-152	Not Detected	---------	1.05E-01
EU-154	Not Detected	---------	2.06E-01
EU-155	Not Detected	---------	1.75E-01
FE-59	Not Detected	---------	7.90E-02
GD-153	Not Detected	---------	1.25E-01
HG-203	Not Detected	---------	3.92E-02
I-131	Not Detected	---------	3.73E-02
IR-192	Not Detected	---------	3.24E-02
K-40	1.82E+01	2.74E+00	2.85E-01
KR-85	Not Detected	---------	9.88E+00
MN-52	Not Detected	---------	3.35E-02
MN-54	Not Detected	---------	3.68E-02
MO-99	Not Detected	---------	2.74E-01
NA-22	Not Detected	---------	4.45E-02
NA-24	Not Detected	---------	4.58E-02
NB-95	Not Detected	---------	1.99E-01
ND-147	Not Detected	---------	2.45E-01
NI-57	Not Detected	---------	3.16E-02
NP-239	Not Detected	---------	1.56E-01
RU-103	Not Detected	---------	3.52E-02
RU-106	Not Detected	---------	3.21E-01
SB-122	Not Detected	---------	5.03E-02
SB-124	Not Detected	---------	3.45E-02
SB-125	Not Detected	---------	1.09E-01
SN-113	Not Detected	---------	4.63E-02
TA-182	Not Detected	---------	1.62E-01
TA-183	Not Detected	---------	4.86E-01
TC-99m	Not Detected	---------	7.54E-02
TL-201	Not Detected	---------	2.23E-01
XE-133	Not Detected	---------	1.81E-01
Y-88	Not Detected	---------	2.58E-02
ZN-65	Not Detected	---------	1.10E-01
ZR-95	Not Detected	---------	6.33E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-08-98 7:53:55 PM *
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *

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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042623-002
Lab Sample ID : 80185002

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 552.000 gram
Sample Date/Time : 9-08-98 10:23:00 AM
Acquire Start Date/Time : 9-08-98 6:11:14 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	1.01E+00
RA-226	1.71E+00	7.81E-01	7.08E-01
PB-214	8.07E-01	2.22E-01	6.09E-02
BI-214	7.17E-01	2.95E-01	5.78E-02
PB-210	Not Detected	---------	4.48E+01
TH-232	1.04E+00	5.31E-01	1.83E-01
RA-228	1.04E+00	3.54E-01	1.96E-01
AC-228	1.07E+00	4.27E-01	3.30E-01
TH-228	1.09E+00	2.84E-01	5.92E-01
RA-224	1.00E+00	3.27E-01	8.59E-02
PB-212	1.05E+00	3.08E-01	5.28E-02
BI-212	1.45E+00	5.72E-01	3.67E-01
TL-208	9.50E-01	1.86E-01	8.43E-02
U-235	Not Detected	---------	2.94E-01
TH-231	Not Detected	---------	3.02E+00
PA-231	Not Detected	---------	5.01E+00
TH-227	Not Detected	---------	4.60E-01
RA-223	Not Detected	---------	2.61E-01
RN-219	Not Detected	---------	5.13E-01
PB-211	Not Detected	---------	1.15E+00
TL-207	Not Detected	---------	1.66E+01
AM-241	Not Detected	---------	6.02E-01
PU-239	Not Detected	---------	5.62E+02
NP-237	Not Detected	---------	4.13E-01
PA-233	Not Detected	---------	7.67E-02
TH-229	Not Detected	---------	3.12E-01

[Summary Report] - Sample ID: : 80185002

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	5.21E-02
AG-110m	Not Detected	---	1.10E-01
BA-133	Not Detected	---	8.52E-02
BE-7	Not Detected	---	3.55E-01
CD-109	Not Detected	---	1.40E+00
CD-115	Not Detected	---	9.62E-02
CE-139	Not Detected	---	3.78E-02
CE-141	Not Detected	---	6.67E-02
CE-144	Not Detected	---	3.01E-01
CO-56	Not Detected	---	4.09E-02
CO-57	Not Detected	---	3.79E-02
CO-58	Not Detected	---	3.98E-02
CO-60	Not Detected	---	4.01E-02
CR-51	Not Detected	---	3.04E-01
CS-134	Not Detected	---	5.97E-02
CS-137	1.20E+00	1.78E-01	2.84E-02
EU-152	Not Detected	---	1.14E-01
EU-154	Not Detected	---	2.39E-01
EU-155	Not Detected	---	1.94E-01
FE-59	Not Detected	---	8.65E-02
GD-153	Not Detected	---	1.30E-01
HG-203	Not Detected	---	4.08E-02
I-131	Not Detected	---	3.92E-02
IR-192	Not Detected	---	3.59E-02
K-40	1.98E+01	2.95E+00	3.05E-01
KR-85	Not Detected	---	1.08E+01
MN-52	Not Detected	---	3.45E-02
MN-54	Not Detected	---	4.19E-02
MO-99	Not Detected	---	3.19E-01
NA-22	Not Detected	---	5.06E-02
NA-24	Not Detected	---	5.65E-02
NB-95	Not Detected	---	2.27E-01
ND-147	Not Detected	---	2.60E-01
NI-57	Not Detected	---	3.40E-02
NP-239	Not Detected	---	1.74E-01
RU-103	Not Detected	---	3.94E-02
RU-106	Not Detected	---	3.72E-01
SB-122	Not Detected	---	5.27E-02
SB-124	Not Detected	---	3.82E-02
SB-125	Not Detected	---	1.15E-01
SN-113	Not Detected	---	5.12E-02
TA-182	Not Detected	---	1.78E-01
TA-183	Not Detected	---	5.38E-01
TC-99m	Not Detected	---	9.81E-02
TL-201	Not Detected	---	2.38E-01
XE-133	Not Detected	---	2.06E-01
Y-88	Not Detected	---	2.72E-02
ZN-65	Not Detected	---	1.22E-01
ZR-95	Not Detected	---	6.82E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-08-98 9:38:52 PM *
****

* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *

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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042624-002
Lab Sample ID : 80185003

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 901.000 gram
Sample Date/Time : 9-08-98 10:29:00 AM
Acquire Start Date/Time : 9-08-98 7:56:04 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.95E-01
RA-226	1.48E+00	7.31E-01	5.54E-01
PB-214	5.28E-01	1.61E-01	3.79E-02
BI-214	4.43E-01	1.31E-01	3.85E-02
PB-210	Not Detected	---------	2.98E+01
TH-232	7.40E-01	3.85E-01	1.24E-01
RA-228	6.81E-01	7.17E-01	1.36E-01
AC-228	7.71E-01	2.05E-01	2.06E-01
TH-228	5.96E-01	2.08E-01	4.16E-01
RA-224	7.27E-01	2.01E-01	5.15E-02
PB-212	7.21E-01	8.60E-01	3.40E-02
BI-212	6.99E-01	4.41E-01	2.65E-01
TL-208	6.28E-01	4.06E-01	5.07E-02
U-235	Not Detected	---------	2.08E-01
TH-231	Not Detected	---------	2.05E+00
PA-231	Not Detected	---------	3.45E+00
TH-227	Not Detected	---------	3.01E-01
RA-223	Not Detected	---------	1.78E-01
RN-219	Not Detected	---------	3.36E-01
PB-211	Not Detected	---------	7.40E-01
TL-207	Not Detected	---------	1.21E+01
AM-241	Not Detected	---------	4.16E-01
PU-239	Not Detected	---------	4.03E+02
NP-237	Not Detected	---------	2.87E-01
PA-233	Not Detected	---------	5.16E-02
TH-229	Not Detected	---------	2.27E-01

[Summary Report] - Sample ID: : 80185003

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.49E-02
AG-110m	Not Detected	---------	5.11E-02
BA-133	Not Detected	---------	5.38E-02
BE-7	Not Detected	---------	2.32E-01
CD-109	Not Detected	---------	9.72E-01
CD-115	Not Detected	---------	6.52E-02
CE-139	Not Detected	---------	2.61E-02
CE-141	Not Detected	---------	4.72E-02
CE-144	Not Detected	---------	2.17E-01
CO-56	Not Detected	---------	2.78E-02
CO-57	Not Detected	---------	2.69E-02
CO-58	Not Detected	---------	2.91E-02
CO-60	Not Detected	---------	3.23E-02
CR-51	Not Detected	---------	2.04E-01
CS-134	Not Detected	---------	3.76E-02
CS-137	3.35E-01	1.80E-01	2.06E-02
EU-152	Not Detected	---------	8.10E-02
EU-154	Not Detected	---------	1.60E-01
EU-155	Not Detected	---------	1.37E-01
FE-59	Not Detected	---------	6.31E-02
GD-153	Not Detected	---------	9.56E-02
HG-203	Not Detected	---------	2.78E-02
I-131	Not Detected	---------	2.68E-02
IR-192	Not Detected	---------	2.44E-02
K-40	1.96E+01	2.84E+00	1.97E-01
KR-85	Not Detected	---------	7.11E+00
MN-52	Not Detected	---------	2.63E-02
MN-54	Not Detected	---------	2.87E-02
MO-99	Not Detected	---------	2.30E-01
NA-22	Not Detected	---------	3.90E-02
NA-24	Not Detected	---------	4.27E-02
NB-95	Not Detected	---------	1.50E-01
ND-147	Not Detected	---------	1.69E-01
NI-57	Not Detected	---------	4.54E-02
NP-239	Not Detected	---------	1.24E-01
RU-103	Not Detected	---------	2.52E-02
RU-106	Not Detected	---------	2.48E-01
SB-122	Not Detected	---------	3.75E-02
SB-124	Not Detected	---------	2.47E-02
SB-125	Not Detected	---------	7.13E-02
SN-113	Not Detected	---------	3.39E-02
TA-182	Not Detected	---------	1.28E-01
TA-183	Not Detected	---------	3.80E-01
TC-99m	Not Detected	---------	8.41E-02
TL-201	Not Detected	---------	1.75E-01
XE-133	Not Detected	---------	1.42E-01
Y-88	Not Detected	---------	1.90E-02
ZN-65	Not Detected	---------	8.80E-02
ZR-95	Not Detected	---------	4.82E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-08-98 11:23:58 PM *
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042625-002
Lab Sample ID : 80185004

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 790.000 gram
Sample Date/Time : 9-08-98 10:30:00 AM
Acquire Start Date/Time : 9-08-98 9:41:07 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.71E-01	5.20E-01	6.53E-01
RA-226	1.41E+00	7.12E-01	5.59E-01
PB-214	5.67E-01	1.06E-01	4.54E-02
BI-214	5.06E-01	3.29E-01	4.37E-02
PB-210	Not Detected	---	3.35E+01
TH-232	7.25E-01	3.60E-01	1.38E-01
RA-228	8.83E-01	2.47E-01	1.49E-01
AC-228	7.97E-01	3.13E-01	2.32E-01
TH-228	8.99E-01	2.61E-01	4.52E-01
RA-224	7.29E-01	2.27E-01	5.96E-02
PB-212	7.38E-01	3.60E-01	3.81E-02
BI-212	7.56E-01	3.04E-01	2.85E-01
TL-208	7.16E-01	1.60E-01	6.08E-02
U-235	Not Detected	---	2.25E-01
TH-231	Not Detected	---	2.27E+00
PA-231	Not Detected	---	3.72E+00
TH-227	Not Detected	---	3.32E-01
RA-223	Not Detected	---	1.92E-01
RN-219	Not Detected	---	3.77E-01
PB-211	Not Detected	---	8.34E-01
TL-207	Not Detected	---	1.25E+01
AM-241	Not Detected	---	4.38E-01
PU-239	Not Detected	---	4.22E+02
NP-237	~~5.31E-01~~	~~2.89E-01~~	3.39E-01
PA-233	Not Detected	---	5.58E-02
TH-229	Not Detected	---	2.39E-01

not detected 9/10/98

[Summary Report] - Sample ID: : 80185004

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.75E-02
AG-110m	Not Detected	---------	7.02E-02
BA-133	Not Detected	---------	5.97E-02
BE-7	Not Detected	---------	1.38E-01
CD-109	Not Detected	---------	1.15E+00
CD-115	Not Detected	---------	7.24E-02
CE-139	Not Detected	---------	2.79E-02
CE-141	Not Detected	---------	5.10E-02
CE-144	Not Detected	---------	2.34E-01
CO-56	Not Detected	---------	3.18E-02
CO-57	Not Detected	---------	2.92E-02
CO-58	Not Detected	---------	2.79E-02
CO-60	Not Detected	---------	3.50E-02
CR-51	Not Detected	---------	2.29E-01
CS-134	Not Detected	---------	4.22E-02
CS-137	6.64E-01	1.06E-01	2.28E-02
EU-152	Not Detected	---------	8.79E-02
EU-154	Not Detected	---------	1.73E-01
EU-155	Not Detected	---------	1.47E-01
FE-59	Not Detected	---------	7.06E-02
GD-153	Not Detected	---------	1.03E-01
HG-203	Not Detected	---------	3.03E-02
I-131	Not Detected	---------	2.84E-02
IR-192	Not Detected	---------	2.68E-02
K-40	2.12E+01	3.04E+00	1.97E-01
KR-85	Not Detected	---------	7.82E+00
MN-52	Not Detected	---------	2.88E-02
MN-54	Not Detected	---------	3.20E-02
MO-99	Not Detected	---------	2.37E-01
NA-22	Not Detected	---------	3.95E-02
NA-24	Not Detected	---------	4.91E-02
NB-95	Not Detected	---------	1.68E-01
ND-147	Not Detected	---------	1.94E-01
NI-57	Not Detected	---------	3.05E-02
NP-239	Not Detected	---------	1.31E-01
RU-103	Not Detected	---------	2.80E-02
RU-106	Not Detected	---------	2.67E-01
SB-122	Not Detected	---------	4.14E-02
SB-124	Not Detected	---------	2.83E-02
SB-125	Not Detected	---------	8.42E-02
SN-113	Not Detected	---------	3.61E-02
TA-182	Not Detected	---------	1.38E-01
TA-183	Not Detected	---------	3.95E-01
TC-99m	Not Detected	---------	1.12E-01
TL-201	Not Detected	---------	1.99E-01
XE-133	Not Detected	---------	1.56E-01
Y-88	Not Detected	---------	2.21E-02
ZN-65	Not Detected	---------	9.38E-02
ZR-95	Not Detected	---------	5.29E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 11:01:21 AM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042627-002
Lab Sample ID : 80185005

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 764.000 gram
Sample Date/Time : 9-08-98 10:41:00 AM
Acquire Start Date/Time : 9-08-98 11:26:19 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	1.05E+00	5.94E-01	6.83E-01
RA-226	1.64E+00	3.83E-01	6.06E-01
PB-214	6.66E-01	1.22E-01	4.99E-02
BI-214	6.32E-01	1.36E-01	4.29E-02
PB-210	Not Detected	---	3.34E+01
TH-232	9.87E-01	4.92E-01	1.61E-01
RA-228	9.82E-01	2.59E-01	1.45E-01
AC-228	9.34E-01	2.43E-01	2.39E-01
TH-228	6.80E-01	2.42E-01	5.29E-01
RA-224	9.13E-01	2.78E-01	7.00E-02
PB-212	9.05E-01	1.52E-01	4.04E-02
BI-212	9.31E-01	5.26E-01	2.59E-01
TL-208	8.69E-01	3.20E-01	5.96E-02
U-235	3.20E-01	2.13E-01	2.47E-01
TH-231	Not Detected	---	2.35E+00
PA-231	Not Detected	---	3.95E+00
TH-227	Not Detected	---	3.67E-01
RA-223	Not Detected	---	2.08E-01
RN-219	Not Detected	---	3.91E-01
PB-211	Not Detected	---	8.93E-01
TL-207	Not Detected	---	1.33E+01
AM-241	Not Detected	---	4.81E-01
PU-239	Not Detected	---	4.53E+02
NP-237	~~6.70E-01~~	~~2.54E-01~~	3.70E-01 Not detected
PA-233	Not Detected	---	6.01E-02
TH-229	Not Detected	---	2.61E-01

9/10/98

[Summary Report] - Sample ID: : 80185005

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.96E-02
AG-110m	Not Detected	---	7.30E-02
BA-133	Not Detected	---	6.59E-02
BE-7	Not Detected	---	2.83E-01
CD-109	Not Detected	---	1.26E+00
CD-115	Not Detected	---	8.27E-02
CE-139	Not Detected	---	3.01E-02
CE-141	Not Detected	---	5.50E-02
CE-144	Not Detected	---	2.48E-01
CO-56	Not Detected	---	3.37E-02
CO-57	Not Detected	---	3.06E-02
CO-58	Not Detected	---	3.17E-02
CO-60	Not Detected	---	3.57E-02
CR-51	Not Detected	---	2.43E-01
CS-134	Not Detected	---	4.59E-02
CS-137	6.81E-01	2.15E-01	2.42E-02
EU-152	Not Detected	---	9.21E-02
EU-154	Not Detected	---	1.82E-01
EU-155	Not Detected	---	1.52E-01
FE-59	Not Detected	---	7.17E-02
GD-153	Not Detected	---	1.08E-01
HG-203	Not Detected	---	3.26E-02
I-131	Not Detected	---	3.07E-02
IR-192	Not Detected	---	2.86E-02
K-40	1.92E+01	2.83E+00	2.45E-01
KR-85	Not Detected	---	8.33E+00
MN-52	Not Detected	---	2.86E-02
MN-54	Not Detected	---	3.41E-02
MO-99	Not Detected	---	2.61E-01
NA-22	Not Detected	---	4.25E-02
NA-24	Not Detected	---	5.76E-02
NB-95	Not Detected	---	1.88E-01
ND-147	Not Detected	---	2.07E-01
NI-57	Not Detected	---	3.27E-02
NP-239	Not Detected	---	1.37E-01
RU-103	Not Detected	---	3.07E-02
RU-106	Not Detected	---	2.77E-01
SB-122	Not Detected	---	4.81E-02
SB-124	Not Detected	---	2.89E-02
SB-125	Not Detected	---	8.84E-02
SN-113	Not Detected	---	3.99E-02
TA-182	Not Detected	---	1.45E-01
TA-183	Not Detected	---	4.42E-01
TC-99m	Not Detected	---	1.42E-01
TL-201	Not Detected	---	2.08E-01
XE-133	Not Detected	---	1.74E-01
Y-88	Not Detected	---	2.07E-02
ZN-65	Not Detected	---	1.00E-01
ZR-95	Not Detected	---	5.51E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-09-98 8:47:59 AM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042628-002
Lab Sample ID : 80185006

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 673.000 gram
Sample Date/Time : 9-08-98 10:44:00 AM
Acquire Start Date/Time : 9-09-98 7:05:05 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	8.08E-01	5.21E-01	6.98E-01
RA-226	1.88E+00	7.94E-01	6.96E-01
PB-214	7.48E-01	1.42E-01	5.12E-02
BI-214	6.24E-01	1.24E-01	4.85E-02
PB-210	Not Detected	---	3.81E+01
TH-232	7.87E-01	1.56E+00	1.75E-01
RA-228	8.77E-01	2.64E-01	1.52E-01
AC-228	9.38E-01	2.78E-01	2.71E-01
TH-228	6.91E-01	2.50E-01	5.41E-01
RA-224	8.32E-01	2.88E-01	7.30E-02
PB-212	8.79E-01	1.57E-01	4.43E-02
BI-212	8.56E-01	3.24E-01	2.86E-01
TL-208	7.06E-01	1.55E-01	7.51E-02
U-235	Not Detected	---	2.54E-01
TH-231	Not Detected	---	2.60E+00
PA-231	Not Detected	---	4.47E+00
TH-227	Not Detected	---	3.87E-01
RA-223	Not Detected	---	2.28E-01
RN-219	Not Detected	---	4.36E-01
PB-211	Not Detected	---	1.01E+00
TL-207	Not Detected	---	1.32E+01
AM-241	Not Detected	---	3.61E-01
PU-239	Not Detected	---	5.16E+02
NP-237	~~5.45E-01~~	~~2.33E-01~~	3.88E-01 Not detected 9/10/98
PA-233	Not Detected	---	6.84E-02
TH-229	Not Detected	---	2.91E-01

[Summary Report] - Sample ID: : 80185006

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.28E-02
AG-110m	Not Detected	---------	1.06E-01
BA-133	Not Detected	---------	7.37E-02
BE-7	Not Detected	---------	3.13E-01
CD-109	Not Detected	---------	1.32E+00
CD-115	Not Detected	---------	9.91E-02
CE-139	Not Detected	---------	3.30E-02
CE-141	Not Detected	---------	5.87E-02
CE-144	Not Detected	---------	2.71E-01
CO-56	Not Detected	---------	3.42E-02
CO-57	Not Detected	---------	3.37E-02
CO-58	Not Detected	---------	3.30E-02
CO-60	Not Detected	---------	3.84E-02
CR-51	Not Detected	---------	2.75E-01
CS-134	Not Detected	---------	5.00E-02
CS-137	1.38E+00	1.99E-01	2.42E-02
EU-152	Not Detected	---------	1.01E-01
EU-154	Not Detected	---------	1.96E-01
EU-155	Not Detected	---------	1.70E-01
FE-59	Not Detected	---------	7.70E-02
GD-153	Not Detected	---------	1.19E-01
HG-203	Not Detected	---------	3.60E-02
I-131	Not Detected	---------	3.74E-02
IR-192	Not Detected	---------	3.24E-02
K-40	1.99E+01	4.10E+00	2.79E-01
KR-85	Not Detected	---------	9.15E+00
MN-52	Not Detected	---------	3.02E-02
MN-54	Not Detected	---------	3.79E-02
MO-99	Not Detected	---------	3.05E-01
NA-22	Not Detected	---------	4.48E-02
NA-24	Not Detected	---------	8.92E-02
NB-95	Not Detected	---------	2.11E-01
ND-147	Not Detected	---------	2.37E-01
NI-57	Not Detected	---------	3.78E-02
NP-239	Not Detected	---------	1.52E-01
RU-103	Not Detected	---------	3.35E-02
RU-106	Not Detected	---------	3.09E-01
SB-122	Not Detected	---------	2.36E-02
SB-124	Not Detected	---------	3.25E-02
SB-125	Not Detected	---------	1.00E-01
SN-113	Not Detected	---------	4.45E-02
TA-182	Not Detected	---------	1.59E-01
TA-183	Not Detected	---------	5.28E-01
TC-99m	Not Detected	---------	3.65E-01
TL-201	Not Detected	---------	2.41E-01
XE-133	Not Detected	---------	2.13E-01
Y-88	Not Detected	---------	2.67E-02
ZN-65	Not Detected	---------	1.06E-01
ZR-95	Not Detected	---------	6.11E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 11:46:27 AM
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Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042629-002
Lab Sample ID : 80185007

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 597.000 gram
Sample Date/Time : 9-08-98 10:45:00 AM
Acquire Start Date/Time : 9-09-98 8:50:13 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.81E-01	6.53E-01	7.96E-01
RA-226	1.91E+00	6.93E-01	6.69E-01
PB-214	6.98E-01	1.51E-01	5.57E-02
BI-214	5.89E-01	2.46E-01	5.15E-02
PB-210	Not Detected	---	4.16E+01
TH-232	8.12E-01	3.97E-01	1.74E-01
RA-228	7.96E-01	2.90E-01	1.87E-01
AC-228	9.21E-01	2.84E-01	3.04E-01
TH-228	9.22E-01	2.94E-01	5.74E-01
RA-224	8.66E-01	2.71E-01	6.89E-02
PB-212	8.24E-01	1.44E-01	4.79E-02
BI-212	9.72E-01	4.17E-01	3.15E-01
TL-208	7.60E-01	3.07E-01	7.79E-02
U-235	Not Detected	---	2.73E-01
TH-231	Not Detected	---	2.71E+00
PA-231	Not Detected	---	4.63E+00
TH-227	Not Detected	---	4.06E-01
RA-223	Not Detected	---	2.31E-01
RN-219	Not Detected	---	4.49E-01
PB-211	Not Detected	---	1.01E+00
TL-207	Not Detected	---	1.46E+01
AM-241	Not Detected	---	5.60E-01
PU-239	Not Detected	---	5.25E+02
NP-237	Not Detected	---	4.23E-01
PA-233	Not Detected	---	6.97E-02
TH-229	Not Detected	---	2.92E-01

[Summary Report] - Sample ID: : 80185007

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.47E-02
AG-110m	Not Detected	---	9.05E-02
BA-133	Not Detected	---	7.67E-02
BE-7	Not Detected	---	3.20E-01
CD-109	~~2.27E+00~~	~~1.40E+00~~	1.44E+00
CD-115	Not Detected	---	1.03E-01
CE-139	Not Detected	---	3.43E-02
CE-141	Not Detected	---	6.27E-02
CE-144	Not Detected	---	2.80E-01
CO-56	Not Detected	---	3.97E-02
CO-57	Not Detected	---	3.54E-02
CO-58	Not Detected	---	3.71E-02
CO-60	Not Detected	---	3.78E-02
CR-51	Not Detected	---	2.79E-01
CS-134	Not Detected	---	5.16E-02
CS-137	8.42E-01	1.31E-01	2.65E-02
EU-152	Not Detected	---	1.07E-01
EU-154	Not Detected	---	2.04E-01
EU-155	Not Detected	---	1.71E-01
FE-59	Not Detected	---	7.74E-02
GD-153	Not Detected	---	1.23E-01
HG-203	Not Detected	---	3.77E-02
I-131	Not Detected	---	3.64E-02
IR-192	Not Detected	---	3.23E-02
K-40	2.14E+01	3.17E+00	3.11E-01
KR-85	Not Detected	---	9.70E+00
MN-52	Not Detected	---	3.57E-02
MN-54	Not Detected	---	3.97E-02
MO-99	Not Detected	---	3.38E-01
NA-22	Not Detected	---	5.10E-02
NA-24	Not Detected	---	1.05E-01
NB-95	Not Detected	---	2.24E-01
ND-147	Not Detected	---	2.42E-01
NI-57	Not Detected	---	5.45E-02
NP-239	Not Detected	---	1.53E-01
RU-103	Not Detected	---	3.52E-02
RU-106	Not Detected	---	3.17E-01
SB-122	Not Detected	---	5.93E-02
SB-124	Not Detected	---	3.42E-02
SB-125	Not Detected	---	1.01E-01
SN-113	Not Detected	---	4.53E-02
TA-182	Not Detected	---	1.71E-01
TA-183	Not Detected	---	5.44E-01
TC-99m	Not Detected	---	4.77E-01
TL-201	Not Detected	---	2.55E-01
XE-133	Not Detected	---	2.14E-01
Y-88	Not Detected	---	2.63E-02
ZN-65	Not Detected	---	1.14E-01
ZR-95	Not Detected	---	6.53E-02

Not detected
9/10/98

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Sandia National Laboratories
*
Radiation Protection Sample Diagnostics Program [806 Laboratory]
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9-09-98 12:20:36 PM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98
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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042630-002
Lab Sample ID : 80185008

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 456.000 gram
Sample Date/Time : 9-08-98 10:46:00 AM
Acquire Start Date/Time : 9-09-98 10:37:46 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	8.06E-01
RA-226	2.25E+00	1.12E+00	1.00E+00
PB-214	9.84E-01	1.70E-01	7.19E-02
BI-214	8.20E-01	2.89E-01	7.19E-02
PB-210	Not Detected	---	5.27E+01
TH-232	1.33E+00	7.04E-01	2.27E-01
RA-228	1.21E+00	3.16E-01	2.18E-01
AC-228	1.24E+00	4.07E-01	3.97E-01
TH-228	1.14E+00	4.25E-01	8.16E-01
RA-224	1.20E+00	4.19E-01	8.42E-02
PB-212	1.19E+00	1.43E+00	6.50E-02
BI-212	1.45E+00	6.83E-01	4.63E-01
TL-208	1.13E+00	1.38E+00	9.70E-02
U-235	3.09E-01	3.01E-01	3.53E-01
TH-231	Not Detected	---	3.64E+00
PA-231	Not Detected	---	5.98E+00
TH-227	Not Detected	---	5.53E-01
RA-223	Not Detected	---	2.99E-01
RN-219	Not Detected	---	6.10E-01
PB-211	Not Detected	---	1.40E+00
TL-207	Not Detected	---	1.94E+01
AM-241	Not Detected	---	7.32E-01
PU-239	Not Detected	---	6.73E+02
NP-237	Not Detected	---	4.96E-01
PA-233	Not Detected	---	9.35E-02
TH-229	Not Detected	---	3.84E-01

[Summary Report] - Sample ID: : 80185008

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	6.05E-02
AG-110m	Not Detected	---------	1.54E-01
BA-133	Not Detected	---------	1.03E-01
BE-7	Not Detected	---------	4.57E-01
CD-109	Not Detected	---------	1.68E+00
CD-115	Not Detected	---------	1.44E-01
CE-139	Not Detected	---------	4.39E-02
CE-141	Not Detected	---------	8.08E-02
CE-144	Not Detected	---------	3.65E-01
CO-56	Not Detected	---------	4.84E-02
CO-57	Not Detected	---------	4.51E-02
CO-58	Not Detected	---------	4.55E-02
CO-60	Not Detected	---------	5.11E-02
CR-51	Not Detected	---------	3.79E-01
CS-134	Not Detected	---------	6.98E-02
CS-137	2.00E+00	2.88E-01	3.51E-02
EU-152	Not Detected	---------	1.36E-01
EU-154	Not Detected	---------	2.78E-01
EU-155	Not Detected	---------	2.25E-01
FE-59	Not Detected	---------	1.07E-01
GD-153	Not Detected	---------	1.56E-01
HG-203	Not Detected	---------	5.01E-02
I-131	Not Detected	---------	5.29E-02
IR-192	Not Detected	---------	4.35E-02
K-40	2.22E+01	3.35E+00	3.98E-01
KR-85	Not Detected	---------	1.31E+01
MN-52	Not Detected	---------	4.48E-02
MN-54	Not Detected	---------	2.76E-02
MO-99	Not Detected	---------	4.45E-01
NA-22	Not Detected	---------	6.16E-02
NA-24	Not Detected	---------	1.45E-01
NB-95	Not Detected	---------	3.10E-01
ND-147	Not Detected	---------	3.37E-01
NI-57	Not Detected	---------	1.09E-01
NP-239	Not Detected	---------	2.00E-01
RU-103	Not Detected	---------	4.74E-02
RU-106	Not Detected	---------	4.50E-01
SB-122	Not Detected	---------	7.80E-02
SB-124	Not Detected	---------	4.67E-02
SB-125	Not Detected	---------	1.39E-01
SN-113	Not Detected	---------	6.45E-02
TA-182	Not Detected	---------	2.19E-01
TA-183	Not Detected	---------	7.21E-01
TC-99m	Not Detected	---------	7.42E-01
TL-201	Not Detected	---------	3.41E-01
XE-133	Not Detected	---------	2.76E-01
Y-88	Not Detected	---------	3.76E-02
ZN-65	Not Detected	---------	1.46E-01
ZR-95	Not Detected	---------	8.08E-02

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Sandia National Laboratories
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Radiation Protection Sample Diagnostics Program [806 Laboratory]
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9-10-98 12:09:38 PM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98
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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042632-002
Lab Sample ID : 80185009

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 665.000 gram
Sample Date/Time : 9-08-98 11:16:00 AM
Acquire Start Date/Time : 9-09-98 12:22:53 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	4.04E-01	4.14E-01	6.81E-01
RA-226	1.97E+00	7.09E-01	6.61E-01
PB-214	7.08E-01	1.35E-01	5.24E-02
BI-214	6.36E-01	1.35E-01	4.88E-02
PB-210	Not Detected	---	3.81E+01
TH-232	8.41E-01	4.04E-01	1.67E-01
RA-228	1.08E+00	2.97E-01	1.41E-01
AC-228	8.68E-01	4.64E-01	2.77E-01
TH-228	7.27E-01	2.60E-01	4.89E-01
RA-224	8.43E-01	2.89E-01	7.45E-02
PB-212	8.50E-01	3.17E-01	4.43E-02
BI-212	1.07E+00	3.56E-01	2.80E-01
TL-208	8.41E-01	1.67E-01	6.47E-02
U-235	Not Detected	---	2.63E-01
TH-231	Not Detected	---	2.60E+00
PA-231	Not Detected	---	4.28E+00
TH-227	Not Detected	---	3.83E-01
RA-223	Not Detected	---	2.37E-01
RN-219	Not Detected	---	4.42E-01
PB-211	Not Detected	---	9.95E-01
TL-207	Not Detected	---	1.39E+01
AM-241	Not Detected	---	5.19E-01
PU-239	Not Detected	---	4.88E+02
NP-237	~~5.14E-01~~	~~2.28E-01~~	3.43E-01 Not detected 9/10/98
PA-233	Not Detected	---	6.53E-02
TH-229	Not Detected	---	2.79E-01

[Summary Report] - Sample ID: : 80185009

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.28E-02
AG-110m	Not Detected	---	9.44E-02
BA-133	Not Detected	---	7.23E-02
BE-7	3.64E-01	3.73E-01	2.27E-01
CD-109	Not Detected	---	1.16E+00
CD-115	Not Detected	---	1.05E-01
CE-139	Not Detected	---	3.24E-02
CE-141	Not Detected	---	6.07E-02
CE-144	Not Detected	---	2.69E-01
CO-56	Not Detected	---	3.65E-02
CO-57	Not Detected	---	3.32E-02
CO-58	Not Detected	---	3.17E-02
CO-60	Not Detected	---	3.91E-02
CR-51	Not Detected	---	2.73E-01
CS-134	Not Detected	---	5.05E-02
CS-137	1.05E+00	1.70E-01	2.60E-02
EU-152	Not Detected	---	1.00E-01
EU-154	Not Detected	---	1.97E-01
EU-155	Not Detected	---	1.66E-01
FE-59	Not Detected	---	7.57E-02
GD-153	Not Detected	---	1.20E-01
HG-203	Not Detected	---	3.49E-02
I-131	Not Detected	---	3.55E-02
IR-192	Not Detected	---	3.15E-02
K-40	1.95E+01	2.90E+00	2.45E-01
KR-85	Not Detected	---	9.25E+00
MN-52	Not Detected	---	3.50E-02
MN-54	Not Detected	---	3.68E-02
MO-99	Not Detected	---	3.21E-01
NA-22	Not Detected	---	4.60E-02
NA-24	Not Detected	---	1.13E-01
NB-95	Not Detected	---	2.17E-01
ND-147	Not Detected	---	2.49E-01
NI-57	Not Detected	---	7.41E-02
NP-239	Not Detected	---	1.49E-01
RU-103	Not Detected	---	3.40E-02
RU-106	Not Detected	---	3.21E-01
SB-122	Not Detected	---	5.76E-02
SB-124	Not Detected	---	3.19E-02
SB-125	Not Detected	---	9.74E-02
SN-113	Not Detected	---	4.43E-02
TA-182	Not Detected	---	1.56E-01
TA-183	Not Detected	---	5.14E-01
TC-99m	Not Detected	---	6.23E-01
TL-201	Not Detected	---	2.52E-01
XE-133	Not Detected	---	2.23E-01
Y-88	Not Detected	---	2.81E-02
ZN-65	Not Detected	---	1.05E-01
ZR-95	Not Detected	---	5.82E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-09-98 3:52:09 PM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98

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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042633-002
Lab Sample ID : 80185010

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 917.000 gram
Sample Date/Time : 9-08-98 11:17:00 AM
Acquire Start Date/Time : 9-09-98 2:09:16 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.07E-01	4.24E-01	5.87E-01
RA-226	1.64E+00	9.00E-01	5.78E-01
PB-214	6.37E-01	1.10E-01	4.13E-02
BI-214	5.78E-01	2.14E-01	3.57E-02
PB-210	Not Detected	---	3.08E+01
TH-232	8.27E-01	3.99E-01	1.32E-01
RA-228	7.59E-01	2.51E-01	1.33E-01
AC-228	8.61E-01	2.45E-01	2.01E-01
TH-228	9.62E-01	2.81E-01	4.66E-01
RA-224	8.48E-01	2.61E-01	5.43E-02
PB-212	8.01E-01	1.89E-01	3.64E-02
BI-212	7.19E-01	7.06E-01	2.72E-01
TL-208	7.02E-01	1.28E-01	5.63E-02
U-235	Not Detected	---	2.09E-01
TH-231	Not Detected	---	2.11E+00
PA-231	Not Detected	---	3.50E+00
TH-227	Not Detected	---	3.16E-01
RA-223	Not Detected	---	1.92E-01
RN-219	Not Detected	---	3.45E-01
PB-211	Not Detected	---	7.83E-01
TL-207	Not Detected	---	1.14E+01
AM-241	Not Detected	---	4.54E-01
PU-239	Not Detected	---	4.03E+02
NP-237	Not Detected	---	3.20E-01
PA-233	Not Detected	---	5.44E-02
TH-229	Not Detected	---	2.31E-01

[Summary Report] - Sample ID: : 80185010

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.46E-02
AG-110m	Not Detected	---	6.29E-02
BA-133	Not Detected	---	5.86E-02
BE-7	2.06E-01	2.07E-01	1.58E-01
CD-109	~~2.09E+00~~	~~8.20E-01~~	1.09E+00 Not detected 9/10/98
CD-115	Not Detected	---	8.63E-02
CE-139	Not Detected	---	2.70E-02
CE-141	Not Detected	---	4.84E-02
CE-144	Not Detected	---	2.21E-01
CO-56	Not Detected	---	2.75E-02
CO-57	Not Detected	---	2.78E-02
CO-58	Not Detected	---	2.67E-02
CO-60	Not Detected	---	3.19E-02
CR-51	Not Detected	---	2.15E-01
CS-134	Not Detected	---	4.03E-02
CS-137	6.11E-01	9.89E-02	1.66E-02
EU-152	Not Detected	---	8.36E-02
EU-154	Not Detected	---	1.59E-01
EU-155	Not Detected	---	1.35E-01
FE-59	Not Detected	---	6.34E-02
GD-153	Not Detected	---	9.44E-02
HG-203	Not Detected	---	2.87E-02
I-131	Not Detected	---	2.84E-02
IR-192	Not Detected	---	2.50E-02
K-40	1.88E+01	2.70E+00	2.09E-01
KR-85	Not Detected	---	7.14E+00
MN-52	Not Detected	---	2.96E-02
MN-54	Not Detected	---	2.95E-02
MO-99	Not Detected	---	2.71E-01
NA-22	Not Detected	---	3.58E-02
NA-24	Not Detected	---	9.86E-02
NB-95	Not Detected	---	1.81E-01
ND-147	Not Detected	---	1.87E-01
NI-57	Not Detected	---	3.52E-02
NP-239	Not Detected	---	1.21E-01
RU-103	Not Detected	---	2.61E-02
RU-106	Not Detected	---	2.46E-01
SB-122	Not Detected	---	4.59E-02
SB-124	Not Detected	---	2.51E-02
SB-125	Not Detected	---	7.54E-02
SN-113	Not Detected	---	3.41E-02
TA-182	Not Detected	---	1.26E-01
TA-183	Not Detected	---	4.53E-01
TC-99m	Not Detected	---	6.35E-01
TL-201	Not Detected	---	2.10E-01
XE-133	Not Detected	---	1.86E-01
Y-88	Not Detected	---	2.04E-02
ZN-65	Not Detected	---	8.89E-02
ZR-95	Not Detected	---	4.88E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-10-98 12:35:53 PM *
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042634-002
Lab Sample ID : 80185011

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 655.000 gram
Sample Date/Time : 9-08-98 11:25:00 AM
Acquire Start Date/Time : 9-09-98 7:44:21 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	8.00E-01	5.26E-01	6.94E-01
RA-226	1.59E+00	8.59E-01	7.12E-01
PB-214	7.56E-01	1.41E-01	5.72E-02
BI-214	6.58E-01	1.30E-01	4.91E-02
PB-210	Not Detected	---	4.14E+01
TH-232	1.01E+00	5.25E-01	1.60E-01
RA-228	9.14E-01	2.95E-01	1.60E-01
AC-228	9.17E-01	3.09E-01	2.79E-01
TH-228	1.21E+00	3.39E-01	5.69E-01
RA-224	8.76E-01	2.71E-01	6.35E-02
PB-212	9.40E-01	3.90E-01	4.71E-02
BI-212	1.03E+00	6.41E-01	3.16E-01
TL-208	8.13E-01	1.71E-01	7.64E-02
U-235	Not Detected	---	2.74E-01
TH-231	Not Detected	---	2.68E+00
PA-231	Not Detected	---	4.50E+00
TH-227	Not Detected	---	4.09E-01
RA-223	Not Detected	---	2.38E-01
RN-219	Not Detected	---	4.74E-01
PB-211	Not Detected	---	1.07E+00
TL-207	Not Detected	---	1.52E+01
AM-241	Not Detected	---	5.45E-01
PU-239	Not Detected	---	5.15E+02
NP-237	Not Detected	---	4.39E-01
PA-233	Not Detected	---	6.99E-02
TH-229	Not Detected	---	2.97E-01

[Summary Report] - Sample ID: : 80185011

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.51E-02
AG-110m	Not Detected	---	1.07E-01
BA-133	Not Detected	---	7.71E-02
BE-7	2.13E-01	1.13E-01	1.50E-01
CD-109	~~2.11E+00~~	~~1.06E+00~~	1.26E+00
CD-115	Not Detected	---	1.21E-01
CE-139	Not Detected	---	3.44E-02
CE-141	Not Detected	---	6.33E-02
CE-144	Not Detected	---	2.79E-01
CO-56	Not Detected	---	3.64E-02
CO-57	Not Detected	---	3.47E-02
CO-58	Not Detected	---	3.44E-02
CO-60	Not Detected	---	4.06E-02
CR-51	Not Detected	---	2.90E-01
CS-134	Not Detected	---	5.10E-02
CS-137	1.35E+00	1.94E-01	2.59E-02
EU-152	Not Detected	---	1.04E-01
EU-154	Not Detected	---	2.06E-01
EU-155	Not Detected	---	1.72E-01
FE-59	Not Detected	---	7.71E-02
GD-153	Not Detected	---	1.22E-01
HG-203	Not Detected	---	3.66E-02
I-131	Not Detected	---	4.01E-02
IR-192	Not Detected	---	3.27E-02
K-40	2.04E+01	3.03E+00	2.77E-01
KR-85	Not Detected	---	9.29E+00
MN-52	Not Detected	---	3.96E-02
MN-54	Not Detected	---	3.87E-02
MO-99	Not Detected	---	3.68E-01
NA-22	Not Detected	---	4.81E-02
NA-24	Not Detected	---	1.48E-01
NB-95	Not Detected	---	2.45E-01
ND-147	Not Detected	---	2.56E-01
NI-57	Not Detected	---	6.38E-02
NP-239	Not Detected	---	1.53E-01
RU-103	Not Detected	---	3.66E-02
RU-106	Not Detected	---	3.31E-01
SB-122	Not Detected	---	6.32E-02
SB-124	Not Detected	---	3.19E-02
SB-125	Not Detected	---	1.05E-01
SN-113	Not Detected	---	4.55E-02
TA-182	Not Detected	---	1.67E-01
TA-183	Not Detected	---	5.67E-01
TC-99m	Not Detected	---	1.51E+00
TL-201	Not Detected	---	2.75E-01
XE-133	Not Detected	---	2.48E-01
Y-88	Not Detected	---	2.60E-02
ZN-65	Not Detected	---	1.13E-01
ZR-95	Not Detected	---	6.14E-02

Not detected
J 8/10/18

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-09-98 11:13:07 PM *
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042635-002
Lab Sample ID : 80185012

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 797.000 gram
Sample Date/Time : 9-08-98 11:26:00 AM
Acquire Start Date/Time : 9-09-98 9:29:55 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.98E-01	4.61E-01	5.77E-01
RA-226	1.55E+00	6.32E-01	5.40E-01
PB-214	6.45E-01	1.29E-01	4.49E-02
BI-214	5.84E-01	1.57E-01	4.27E-02
PB-210	Not Detected	---	3.31E+01
TH-232	8.52E-01	4.04E-01	1.40E-01
RA-228	8.73E-01	2.46E-01	1.53E-01
AC-228	7.89E-01	2.24E-01	2.28E-01
TH-228	5.49E-01	2.13E-01	5.11E-01
RA-224	8.20E-01	2.55E-01	6.48E-02
PB-212	7.98E-01	2.30E-01	3.78E-02
BI-212	9.45E-01	4.20E-01	2.83E-01
TL-208	6.94E-01	1.07E-01	5.97E-02
U-235	Not Detected	---	2.30E-01
TH-231	Not Detected	---	2.32E+00
PA-231	Not Detected	---	3.92E+00
TH-227	Not Detected	---	3.43E-01
RA-223	Not Detected	---	2.17E-01
RN-219	Not Detected	---	3.86E-01
PB-211	Not Detected	---	8.81E-01
TL-207	Not Detected	---	1.29E+01
AM-241	Not Detected	---	4.82E-01
PU-239	Not Detected	---	4.48E+02
NP-237	Not Detected	---	2.97E-01
PA-233	Not Detected	---	6.09E-02
TH-229	Not Detected	---	2.50E-01

[Summary Report] - Sample ID: : 80185012

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.83E-02
AG-110m	Not Detected	---	8.41E-02
BA-133	Not Detected	---	6.34E-02
BE-7	Not Detected	---	2.88E-01
CD-109	Not Detected	---	1.01E+00
CD-115	Not Detected	---	1.04E-01
CE-139	Not Detected	---	2.95E-02
CE-141	Not Detected	---	5.31E-02
CE-144	Not Detected	---	2.44E-01
CO-56	Not Detected	---	3.04E-02
CO-57	Not Detected	---	3.03E-02
CO-58	Not Detected	---	2.97E-02
CO-60	Not Detected	---	3.29E-02
CR-51	Not Detected	---	2.45E-01
CS-134	Not Detected	---	4.31E-02
CS-137	9.96E-01	1.45E-01	2.26E-02
EU-152	Not Detected	---	9.12E-02
EU-154	Not Detected	---	1.78E-01
EU-155	Not Detected	---	1.50E-01
FE-59	Not Detected	---	7.04E-02
GD-153	Not Detected	---	1.04E-01
HG-203	Not Detected	---	3.29E-02
I-131	Not Detected	---	3.39E-02
IR-192	Not Detected	---	2.89E-02
K-40	1.91E+01	2.76E+00	2.28E-01
KR-85	Not Detected	---	8.00E+00
MN-52	Not Detected	---	3.37E-02
MN-54	Not Detected	---	3.06E-02
MO-99	Not Detected	---	3.14E-01
NA-22	Not Detected	---	4.11E-02
NA-24	Not Detected	---	1.48E-01
NB-95	Not Detected	---	2.09E-01
ND-147	Not Detected	---	2.14E-01
NI-57	Not Detected	---	4.41E-02
NP-239	Not Detected	---	1.35E-01
RU-103	Not Detected	---	3.18E-02
RU-106	Not Detected	---	2.80E-01
SB-122	Not Detected	---	5.77E-02
SB-124	Not Detected	---	2.81E-02
SB-125	Not Detected	---	8.82E-02
SN-113	Not Detected	---	3.86E-02
TA-182	Not Detected	---	1.45E-01
TA-183	Not Detected	---	5.01E-01
TC-99m	Not Detected	---	1.58E+00
TL-201	Not Detected	---	2.49E-01
XE-133	Not Detected	---	2.27E-01
Y-88	Not Detected	---	2.24E-02
ZN-65	Not Detected	---	9.76E-02
ZR-95	Not Detected	---	5.68E-02

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Sandia National Laboratories
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Radiation Protection Sample Diagnostics Program [806 Laboratory]
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9-10-98 2:43:52 AM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042639-002
Lab Sample ID : 80185014

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 776.000 gram
Sample Date/Time : 9-08-98 11:43:00 AM
Acquire Start Date/Time : 9-10-98 1:00:33 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.87E-01
RA-226	1.52E+00	6.55E-01	5.56E-01
PB-214	7.04E-01	1.29E-01	4.70E-02
BI-214	6.56E-01	1.25E-01	4.18E-02
PB-210	Not Detected	---	3.55E+01
TH-232	8.96E-01	6.22E-01	1.47E-01
RA-228	8.95E-01	2.17E-01	1.42E-01
AC-228	9.24E-01	7.70E-01	2.37E-01
TH-228	9.50E-01	2.80E-01	4.86E-01
RA-224	9.04E-01	2.61E-01	6.48E-02
PB-212	8.53E-01	7.86E-01	3.90E-02
BI-212	1.04E+00	3.88E-01	2.92E-01
TL-208	7.75E-01	1.97E-01	7.08E-02
U-235	Not Detected	---	2.40E-01
TH-231	Not Detected	---	2.41E+00
PA-231	Not Detected	---	4.00E+00
TH-227	Not Detected	---	3.58E-01
RA-223	Not Detected	---	2.18E-01
RN-219	Not Detected	---	4.08E-01
PB-211	Not Detected	---	9.12E-01
TL-207	Not Detected	---	1.31E+01
AM-241	Not Detected	---	4.87E-01
PU-239	Not Detected	---	4.63E+02
NP-237	Not Detected	---	3.38E-01
PA-233	Not Detected	---	6.20E-02
TH-229	Not Detected	---	2.59E-01

[Summary Report] - Sample ID: : 80185014

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.03E-02
AG-110m	Not Detected	---------	8.51E-02
BA-133	Not Detected	---------	6.71E-02
BE-7	1.15E-01	9.87E-02	1.40E-01
CD-109	Not Detected	---------	1.15E+00
CD-115	Not Detected	---------	1.11E-01
CE-139	Not Detected	---------	3.02E-02
CE-141	Not Detected	---------	5.52E-02
CE-144	Not Detected	---------	2.55E-01
CO-56	Not Detected	---------	3.32E-02
CO-57	Not Detected	---------	3.13E-02
CO-58	Not Detected	---------	3.12E-02
CO-60	Not Detected	---------	3.59E-02
CR-51	Not Detected	---------	2.55E-01
CS-134	Not Detected	---------	4.52E-02
CS-137	9.94E-01	1.45E-01	2.21E-02
EU-152	Not Detected	---------	9.41E-02
EU-154	Not Detected	---------	1.86E-01
EU-155	Not Detected	---------	1.54E-01
FE-59	Not Detected	---------	6.99E-02
GD-153	Not Detected	---------	1.11E-01
HG-203	Not Detected	---------	3.27E-02
I-131	Not Detected	---------	3.44E-02
IR-192	Not Detected	---------	2.95E-02
K-40	1.94E+01	2.83E+00	2.41E-01
KR-85	Not Detected	---------	8.38E+00
MN-52	Not Detected	---------	3.70E-02
MN-54	Not Detected	---------	1.52E-02
MO-99	Not Detected	---------	3.36E-01
NA-22	Not Detected	---------	4.21E-02
NA-24	Not Detected	---------	1.73E-01
NB-95	Not Detected	---------	2.23E-01
ND-147	Not Detected	---------	2.22E-01
NI-57	Not Detected	---------	4.69E-02
NP-239	Not Detected	---------	1.39E-01
RU-103	Not Detected	---------	3.17E-02
RU-106	Not Detected	---------	2.81E-01
SB-122	Not Detected	---------	5.74E-02
SB-124	Not Detected	---------	2.93E-02
SB-125	Not Detected	---------	8.90E-02
SN-113	Not Detected	---------	4.02E-02
TA-182	Not Detected	---------	1.47E-01
TA-183	Not Detected	---------	5.11E-01
TC-99m	Not Detected	---------	2.41E+00
TL-201	Not Detected	---------	2.68E-01
XE-133	Not Detected	---------	2.35E-01
Y-88	Not Detected	---------	2.31E-02
ZN-65	Not Detected	---------	1.01E-01
ZR-95	Not Detected	---------	5.62E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-10-98 6:08:29 PM *
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042636-002
Lab Sample ID : 80185015

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 816.000 gram
Sample Date/Time : 9-08-98 11:34:00 AM
Acquire Start Date/Time : 9-10-98 2:46:10 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.09E-01	4.05E-01	6.14E-01
RA-226	1.55E+00	7.15E-01	5.67E-01
PB-214	7.12E-01	1.33E-01	4.34E-02
BI-214	5.61E-01	1.08E-01	4.15E-02
PB-210	Not Detected	---	3.28E+01
TH-232	8.81E-01	4.40E-01	1.33E-01
RA-228	9.01E-01	2.66E-01	1.47E-01
AC-228	8.51E-01	2.50E-01	2.27E-01
TH-228	8.61E-01	2.50E-01	4.57E-01
RA-224	8.63E-01	2.69E-01	5.53E-02
PB-212	8.65E-01	1.39E-01	3.64E-02
BI-212	1.12E+00	4.70E-01	2.89E-01
TL-208	8.12E-01	1.51E-01	5.63E-02
U-235	Not Detected	---	2.20E-01
TH-231	Not Detected	---	2.17E+00
PA-231	Not Detected	---	3.75E+00
TH-227	Not Detected	---	3.39E-01
RA-223	Not Detected	---	2.12E-01
RN-219	Not Detected	---	3.60E-01
PB-211	Not Detected	---	8.16E-01
TL-207	Not Detected	---	1.27E+01
AM-241	Not Detected	---	4.55E-01
PU-239	Not Detected	---	4.31E+02
NP-237	Not Detected	---	3.10E-01
PA-233	Not Detected	---	5.53E-02
TH-229	Not Detected	---	2.43E-01

[Summary Report] - Sample ID: : 80185015

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.74E-02
AG-110m	Not Detected	---	4.90E-02
BA-133	Not Detected	---	6.36E-02
BE-7	Not Detected	---	2.55E-01
CD-109	~~1.08E+00~~	~~7.03E-01~~	1.05E+00
CD-115	Not Detected	---	1.08E-01
CE-139	Not Detected	---	2.82E-02
CE-141	Not Detected	---	5.06E-02
CE-144	Not Detected	---	2.33E-01
CO-56	Not Detected	---	3.10E-02
CO-57	Not Detected	---	2.96E-02
CO-58	Not Detected	---	2.97E-02
CO-60	Not Detected	---	3.19E-02
CR-51	Not Detected	---	2.19E-01
CS-134	Not Detected	---	4.18E-02
CS-137	2.57E-01	9.60E-02	2.05E-02
EU-152	Not Detected	---	8.90E-02
EU-154	Not Detected	---	1.72E-01
EU-155	Not Detected	---	1.42E-01
FE-59	Not Detected	---	6.71E-02
GD-153	Not Detected	---	1.04E-01
HG-203	Not Detected	---	3.08E-02
I-131	Not Detected	---	3.22E-02
IR-192	Not Detected	---	2.58E-02
K-40	1.93E+01	2.78E+00	2.24E-01
KR-85	Not Detected	---	7.92E+00
MN-52	Not Detected	---	3.30E-02
MN-54	Not Detected	---	3.27E-02
MO-99	Not Detected	---	3.35E-01
NA-22	Not Detected	---	4.05E-02
NA-24	Not Detected	---	1.87E-01
NB-95	Not Detected	---	2.15E-01
ND-147	Not Detected	---	2.08E-01
NI-57	Not Detected	---	9.28E-02
NP-239	Not Detected	---	1.29E-01
RU-103	Not Detected	---	2.75E-02
RU-106	Not Detected	---	2.65E-01
SB-122	Not Detected	---	3.09E-02
SB-124	Not Detected	---	2.69E-02
SB-125	Not Detected	---	7.92E-02
SN-113	Not Detected	---	3.58E-02
TA-182	Not Detected	---	1.37E-01
TA-183	Not Detected	---	4.86E-01
TC-99m	Not Detected	---	2.76E+00
TL-201	Not Detected	---	2.56E-01
XE-133	Not Detected	---	2.39E-01
Y-88	Not Detected	---	2.28E-02
ZN-65	Not Detected	---	9.32E-02
ZR-95	Not Detected	---	5.47E-02

Not detected
9/10/98

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 6:14:09 AM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042637-002
Lab Sample ID : 80185016

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 682.000 gram
Sample Date/Time : 9-08-98 11:37:00 AM
Acquire Start Date/Time : 9-10-98 4:31:19 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	7.55E-01	5.08E-01	7.47E-01
RA-226	1.84E+00	9.87E-01	6.93E-01
PB-214	7.45E-01	1.41E-01	6.30E-02
BI-214	6.16E-01	1.36E-01	4.93E-02
PB-210	Not Detected	---	4.30E+01
TH-232	1.07E+00	5.63E-01	2.07E-01
RA-228	8.32E-01	2.20E-01	1.57E-01
AC-228	7.84E-01	9.28E-01	2.70E-01
TH-228	8.57E-01	3.09E-01	6.19E-01
RA-224	8.80E-01	2.97E-01	6.42E-02
PB-212	8.37E-01	2.21E-01	4.70E-02
BI-212	1.03E+00	4.26E-01	3.07E-01
TL-208	8.32E-01	1.21E-01	7.34E-02
U-235	Not Detected	---	2.80E-01
TH-231	Not Detected	---	2.88E+00
PA-231	Not Detected	---	4.82E+00
TH-227	Not Detected	---	3.97E-01
RA-223	Not Detected	---	2.63E-01
RN-219	Not Detected	---	5.21E-01
PB-211	Not Detected	---	1.18E+00
TL-207	Not Detected	---	1.43E+01
AM-241	Not Detected	---	5.68E-01
PU-239	Not Detected	---	5.21E+02
NP-237	Not Detected	---	3.94E-01
PA-233	Not Detected	---	7.48E-02
TH-229	Not Detected	---	3.03E-01

[Summary Report] - Sample ID: : 80185016

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.27E-02
AG-110m	Not Detected	---	1.50E-01
BA-133	Not Detected	---	7.78E-02
BE-7	Not Detected	---	3.92E-01
CD-109	~~1.56E+00~~	~~7.60E-01~~	1.34E+00
CD-115	Not Detected	---	1.42E-01
CE-139	Not Detected	---	3.64E-02
CE-141	Not Detected	---	6.53E-02
CE-144	Not Detected	---	2.86E-01
CO-56	Not Detected	---	3.46E-02
CO-57	Not Detected	---	3.69E-02
CO-58	Not Detected	---	3.44E-02
CO-60	Not Detected	---	3.78E-02
CR-51	Not Detected	---	3.13E-01
CS-134	Not Detected	---	4.99E-02
CS-137	2.96E+00	4.05E-01	2.67E-02
EU-152	Not Detected	---	1.11E-01
EU-154	Not Detected	---	1.97E-01
EU-155	Not Detected	---	1.76E-01
FE-59	Not Detected	---	8.22E-02
GD-153	Not Detected	---	1.28E-01
HG-203	Not Detected	---	3.99E-02
I-131	Not Detected	---	4.43E-02
IR-192	Not Detected	---	3.57E-02
K-40	2.22E+01	3.21E+00	2.72E-01
KR-85	Not Detected	---	1.01E+01
MN-52	Not Detected	---	3.51E-02
MN-54	Not Detected	---	3.68E-02
MO-99	Not Detected	---	3.92E-01
NA-22	Not Detected	---	4.62E-02
NA-24	Not Detected	---	2.34E-01
NB-95	Not Detected	---	2.55E-01
ND-147	Not Detected	---	2.85E-01
NI-57	Not Detected	---	5.89E-02
NP-239	Not Detected	---	1.59E-01
RU-103	Not Detected	---	4.10E-02
RU-106	Not Detected	---	3.35E-01
SB-122	Not Detected	---	7.16E-02
SB-124	Not Detected	---	3.41E-02
SB-125	Not Detected	---	1.21E-01
SN-113	Not Detected	---	5.06E-02
TA-182	Not Detected	---	1.66E-01
TA-183	Not Detected	---	6.09E-01
TC-99m	Not Detected	---	4.24E+00
TL-201	Not Detected	---	3.17E-01
XE-133	Not Detected	---	2.96E-01
Y-88	Not Detected	---	2.91E-02
ZN-65	Not Detected	---	1.15E-01
ZR-95	Not Detected	---	6.30E-02

Not detected
J 9/10/98

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Sandia National Laboratories
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Radiation Protection Sample Diagnostics Program [806 Laboratory]
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9-10-98 6:28:17 PM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042626-002
Lab Sample ID : 80185017

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 719.000 gram
Sample Date/Time : 9-08-98 10:32:00 AM
Acquire Start Date/Time : 9-10-98 9:28:01 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.30E-01	4.20E-01	6.07E-01
RA-226	1.42E+00	6.18E-01	5.38E-01
PB-214	6.43E-01	5.16E-01	4.37E-02
BI-214	5.55E-01	1.16E-01	4.46E-02
PB-210	Not Detected	---	3.73E+01
TH-232	8.35E-01	3.98E-01	1.53E-01
RA-228	8.93E-01	2.37E-01	1.42E-01
AC-228	8.75E-01	2.42E-01	2.54E-01
TH-228	7.67E-01	2.58E-01	5.18E-01
RA-224	9.55E-01	2.66E-01	7.14E-02
PB-212	8.07E-01	1.34E-01	3.92E-02
BI-212	9.51E-01	4.63E-01	2.88E-01
TL-208	7.62E-01	1.50E-01	6.51E-02
U-235	Not Detected	---	2.37E-01
TH-231	Not Detected	---	2.37E+00
PA-231	Not Detected	---	3.99E+00
TH-227	Not Detected	---	3.60E-01
RA-223	Not Detected	---	2.31E-01
RN-219	Not Detected	---	3.91E-01
PB-211	Not Detected	---	8.73E-01
TL-207	Not Detected	---	1.31E+01
AM-241	Not Detected	---	4.92E-01
PU-239	Not Detected	---	4.51E+02
NP-237	Not Detected	---	3.36E-01
PA-233	Not Detected	---	6.07E-02
TH-229	Not Detected	---	2.50E-01

[Summary Report] - Sample ID: : 80185017

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.18E-02
AG-110m	Not Detected	---	6.38E-02
BA-133	Not Detected	---	6.56E-02
BE-7	1.39E-01	1.14E-01	1.54E-01
CD-109	~~1.43E+00~~	~~6.94E-01~~	1.14E+00
CD-115	Not Detected	---	1.25E-01
CE-139	Not Detected	---	2.98E-02
CE-141	Not Detected	---	5.45E-02
CE-144	Not Detected	---	2.46E-01
CO-56	Not Detected	---	3.26E-02
CO-57	Not Detected	---	3.07E-02
CO-58	Not Detected	---	3.15E-02
CO-60	Not Detected	---	3.54E-02
CR-51	Not Detected	---	2.54E-01
CS-134	Not Detected	---	4.57E-02
CS-137	4.52E-01	8.30E-02	2.30E-02
EU-152	Not Detected	---	9.23E-02
EU-154	Not Detected	---	1.93E-01
EU-155	Not Detected	---	1.51E-01
FE-59	Not Detected	---	7.26E-02
GD-153	Not Detected	---	1.05E-01
HG-203	Not Detected	---	3.34E-02
I-131	Not Detected	---	3.44E-02
IR-192	Not Detected	---	2.89E-02
K-40	1.83E+01	3.02E+00	2.68E-01
KR-85	Not Detected	---	8.57E+00
MN-52	Not Detected	---	3.70E-02
MN-54	Not Detected	---	3.40E-02
MO-99	Not Detected	---	3.69E-01
NA-22	Not Detected	---	4.38E-02
NA-24	Not Detected	---	2.67E-01
NB-95	Not Detected	---	2.42E-01
ND-147	Not Detected	---	2.34E-01
NI-57	~~1.14E-01~~	~~4.91E-02~~	6.08E-02
NP-239	Not Detected	---	1.35E-01
RU-103	Not Detected	---	3.18E-02
RU-106	Not Detected	---	2.76E-01
SB-122	Not Detected	---	6.65E-02
SB-124	Not Detected	---	2.90E-02
SB-125	Not Detected	---	8.74E-02
SN-113	Not Detected	---	3.91E-02
TA-182	Not Detected	---	1.50E-01
TA-183	Not Detected	---	5.56E-01
TC-99m	Not Detected	---	7.12E+00
TL-201	Not Detected	---	2.84E-01
XE-133	Not Detected	---	2.73E-01
Y-88	Not Detected	---	2.59E-02
ZN-65	Not Detected	---	1.02E-01
ZR-95	Not Detected	---	5.75E-02

Not detected 9/10/98

Not detected 9/10/98

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Sandia National Laboratories
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Radiation Protection Sample Diagnostics Program [806 Laboratory]
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9-10-98 6:55:12 PM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
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Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042631-002
Lab Sample ID : 80185018

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 833.000 gram
Sample Date/Time : 9-08-98 11:14:00 AM
Acquire Start Date/Time : 9-10-98 11:15:45 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	7.04E-01	4.83E-01	5.93E-01
RA-226	1.15E+00	5.82E-01	5.01E-01
PB-214	5.13E-01	9.82E-02	3.93E-02
BI-214	4.54E-01	9.06E-02	3.96E-02
PB-210	Not Detected	---	3.09E+01
TH-232	6.84E-01	3.73E-01	1.25E-01
RA-228	5.95E-01	3.39E-01	1.33E-01
AC-228	6.25E-01	2.09E-01	2.21E-01
TH-228	5.26E-01	2.13E-01	4.08E-01
RA-224	7.43E-01	2.41E-01	5.24E-02
PB-212	6.35E-01	2.47E-01	3.53E-02
BI-212	7.82E-01	4.18E-01	2.86E-01
TL-208	5.48E-01	3.68E-01	5.22E-02
U-235	Not Detected	---	2.11E-01
TH-231	Not Detected	---	2.06E+00
PA-231	Not Detected	---	3.48E+00
TH-227	Not Detected	---	2.99E-01
RA-223	Not Detected	---	1.95E-01
RN-219	Not Detected	---	3.26E-01
PB-211	Not Detected	---	7.48E-01
TL-207	Not Detected	---	1.17E+01
AM-241	Not Detected	---	4.28E-01
PU-239	Not Detected	---	3.99E+02
NP-237	Not Detected	---	3.47E-01
PA-233	Not Detected	---	5.27E-02
TH-229	Not Detected	---	2.22E-01

[Summary Report] - Sample ID: : 80185018

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.51E-02
AG-110m	Not Detected	---	5.16E-02
BA-133	Not Detected	---	5.52E-02
BE-7	1.07E+00	3.29E-01	1.58E-01
CD-109	~~1.70E+00~~	~~8.88E-01~~	1.01E+00
CD-115	Not Detected	---	1.09E-01
CE-139	Not Detected	---	2.66E-02
CE-141	Not Detected	---	4.96E-02
CE-144	Not Detected	---	2.18E-01
CO-56	Not Detected	---	3.06E-02
CO-57	Not Detected	---	2.69E-02
CO-58	Not Detected	---	2.95E-02
CO-60	Not Detected	---	3.40E-02
CR-51	Not Detected	---	2.15E-01
CS-134	Not Detected	---	3.80E-02
CS-137	3.26E-01	8.74E-02	2.12E-02
EU-152	Not Detected	---	8.08E-02
EU-154	Not Detected	---	1.63E-01
EU-155	Not Detected	---	1.35E-01
FE-59	Not Detected	---	6.98E-02
GD-153	Not Detected	---	9.55E-02
HG-203	Not Detected	---	2.90E-02
I-131	Not Detected	---	3.03E-02
IR-192	Not Detected	---	2.50E-02
K-40	2.11E+01	3.03E+00	2.00E-01
KR-85	Not Detected	---	7.24E+00
MN-52	Not Detected	---	3.04E-02
MN-54	Not Detected	---	3.07E-02
MO-99	Not Detected	---	3.37E-01
NA-22	Not Detected	---	4.03E-02
NA-24	Not Detected	---	2.72E-01
NB-95	Not Detected	---	2.03E-01
ND-147	Not Detected	---	2.03E-01
NI-57	Not Detected	---	4.43E-02
NP-239	Not Detected	---	1.22E-01
RU-103	Not Detected	---	2.71E-02
RU-106	Not Detected	---	2.48E-01
SB-122	Not Detected	---	6.01E-02
SB-124	Not Detected	---	2.49E-02
SB-125	Not Detected	---	7.40E-02
SN-113	Not Detected	---	3.34E-02
TA-182	Not Detected	---	1.29E-01
TA-183	Not Detected	---	4.82E-01
TC-99m	Not Detected	---	7.07E+00
TL-201	Not Detected	---	2.52E-01
XE-133	Not Detected	---	2.40E-01
Y-88	Not Detected	---	2.11E-02
ZN-65	Not Detected	---	8.85E-02
ZR-95	Not Detected	---	4.74E-02

Not detected
9/10/98

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*
Sandia National Laboratories
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*
Radiation Protection Sample Diagnostics Program [806 Laboratory]
*
*
9-10-98 1:14:15 PM
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
****

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 80185019

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 9-10-98 1:02:04 PM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	4.55E+03
RA-226	Not Detected	---	6.23E+03
PB-214	Not Detected	---	7.01E+02
BI-214	Not Detected	---	6.28E+02
PB-210	Not Detected	---	2.65E+05
TH-232	Not Detected	---	2.23E+03
RA-228	Not Detected	---	2.49E+03
AC-228	Not Detected	---	1.49E+03
TH-228	Not Detected	---	1.19E+05
RA-224	Not Detected	---	3.97E+03
PB-212	Not Detected	---	8.76E+03
BI-212	Not Detected	---	7.23E+04
TL-208	Not Detected	---	1.63E+04
U-235	Not Detected	---	1.73E+03
TH-231	Not Detected	---	2.09E+04
PA-231	Not Detected	---	3.57E+04
TH-227	Not Detected	---	2.55E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.81E+03
PB-211	Not Detected	---	1.32E+04
TL-207	Not Detected	---	2.14E+05
AM-241	7.91E+04	1.42E+04	3.18E+03
PU-239	Not Detected	---	3.17E+06
NP-237	Not Detected	---	2.37E+03
PA-233	Not Detected	---	6.22E+02
TH-229	Not Detected	---	1.71E+03

[Summary Report] - Sample ID: : 80185019

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.20E+02
AG-110m	Not Detected	---	4.78E+06
BA-133	Not Detected	---	7.24E+02
BE-7	Not Detected	---	5.66E+19
CD-109	2.78E+05	2.62E+05	4.06E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	4.32E+08
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	1.94E+06
CO-56	Not Detected	---	5.68E+13
CO-57	Not Detected	---	3.40E+05
CO-58	Not Detected	---	5.19E+14
CO-60	8.18E+04	1.11E+04	4.42E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	4.04E+03
CS-137	7.16E+04	9.53E+03	2.61E+02
EU-152	Not Detected	---	1.02E+03
EU-154	Not Detected	---	2.65E+03
EU-155	Not Detected	---	3.39E+03
FE-59	Not Detected	---	2.03E+22
GD-153	Not Detected	---	2.69E+06
HG-203	Not Detected	---	1.03E+21
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.44E+14
K-40	Not Detected	---	1.34E+03
KR-85	Not Detected	---	1.20E+05
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	2.00E+05
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.69E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
NP-239	Not Detected	---	9.45E+02
RU-103	Not Detected	---	1.00E+26
RU-106	Not Detected	---	6.59E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	6.37E+16
SB-125	Not Detected	---	8.10E+03
SN-113	Not Detected	---	1.43E+10
TA-182	Not Detected	---	3.72E+10
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	1.84E+10
ZN-65	Not Detected	---	2.95E+06
ZR-95	Not Detected	---	1.71E+16

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
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Report Date : 9-10-98 1:14:56 PM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 80185019
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 9-10-98 1:02:04 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.235E-02	4.285E-03	7.914E-02	<	:	:	: >
CS-137 Activity	7.039E-02	2.043E-03	7.164E-02	<	:	:	: >
CO-60 Activity	7.831E-02	2.217E-03	8.163E-02	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 9/10/98

Feature 58L

Supersedes (5-97) Issue

Internal Lab Batch No. 801850

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SAR/WR No.

AR/COC- 600804

Dept. No./Mail Stop: 6134/MS-1148
Project/Task Manager: Caroline Byrd
Project Name: Site 58 foothills RFI Field
Record Center Code: ER/1333/58/Dat
Logbook Ref. No.:
Service Order No.:CFO535

Date Samples Shipped: 9/8/98 SMO USE
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: 881
SMO Contact/Phone: Doug Salmi 844-3110
Send Report to SMO: S. Montano/844-3110

Contract No.:
Case No.: 7213.130
SMO Authorization
Bill to: Sandia National Laboratories
Supplier Services, Dept.
P.O. Box 5800 MS 0154

Location Tech Area N/A
Building N/A Room N/A

Sample No. – Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO) Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested	LAB USE Lab Sample ID
042622-002	S58J-GR-135-0-SS	0	58J	9/8/98 1018	S	M	500ml	4C	Gr	SA	GAMMA SPEC	
042623-002	S58J-GR-136-0-SS			9/8/98 1023								
042624-002	S58J-GR-137-0-SS			9/8/98 1029								
042625-002	S58J-GR-138-0-SS			9/8/98 1030								
042627-002	S58J-GR-140-0-SS			9/8/98 1041								
042628-002	S58J-GR-141-0-SS			9/8/98 1044								
042629-002	S58J-GR-142-0-SS			9/8/98 1045								
042630-002	S58J-GR-143-0-SS			9/8/98 1046								
042632-002	S58L-GR-145-0-SS		58L	9/8/98 1116								
042633-002	S58L-GR-146-0-SS			9/8/98 1117								

RMMA ☐Yes ☒No Ref. No.

Sample Disposal ☐Return to Client ☒Disposal by lab

Sample Tracking SMO USE
Date Entered (mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☒Yes ☐No
Raw data package ☒Yes ☐No
Sent copy to Ed Mignardot

Abnormal Conditions on Receipt LAB USE

Turnaround Time ☒Normal ☐Rush Required Report Date

QC inits.

Sample Team Members	Name	Signature	Init	Company/Organization/Phon
	John Boyd		JB	IT/6131 /
	Gill Baltazar		GB	Weston/6131 /971-2769

1. Relinquished by		Org.		Date		Time	4. Relinquished by	Org. Date
1. Received by		Org. FT6134		Date 9-8-98		Time 1451	4. Received by	Org. Date
2. Relinquished by		Org. 7577		Date 9-8-98		Time 1451	5. Relinquished by	Org. Date
2. Received by		Org. 7577		Date 9-8-98		Time 1520	5. Received by	Org. Date
3. Relinquished by	FOR KAT	Org. 7578		Date 9/8/98		Time 1520	6. Relinquished by	Org. Date
3. Received by		Org. SNL7578		Date 9/11/98		Time 1105	6. Received by	Org. Date
		Org. 7577		Date 9/11/98		Time 1105		

Original To Accompany Samples, Laboratory Copy (White)

1st Copy To Accompany Samples, Return to SMO (Blue)

2nd Copy SMO Suspense Copy (Yellow)

3rd Copy Field Copy (Pink)

-COC (10-97)

es (5-97) issue

BATCH #801850

ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Press F1 for instructions for each field.

AR/COC- 600804

t Name: Site 58 foothills RFI Field | Project/Task Manager: Caroline Byrd | Case No.: 7213.130

Location | Tech Area N/A | Room N/A

ng N/A

Reference LOV (available at SMO)

ample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested	LAB USE Lab Sample ID
											GAMMA SPEC	
)42634-002	S58L-GR-147-0-SS	0	58L	9/8/98 1125	S	M	500ml	4C	GR	SA		
)42635-002	S58L-GR-148-0-SS			9/8/98 1126								
)42638-002	S58L-GR-151-0-SS			9/8/98 1140								
)42639-002	S58L-GR-152-0-SS			9/8/98 1143								
)42636-002	S58L-GR-149-0-SS		58L	9/8/98 1134								
)42637-002	S58L-GR-150-0-SS		58L	9/8/98 1137								
)42626-002	S58J-GR-139-0-SS		58J	9/8/98 1032								
)42631-002	S58L-GR-144-0-SS		58L	9/8/98 1114								

LAB USE

normal Conditions on Receipt

cipient Initials _____

iginal To Accompany Samples, Laboratory Copy (White)

1st Copy To Accompany Samples, Return to SMO (Blue)

2nd Copy SMO Suspense Copy (Yellow)

3rd Copy Field Copy (Pink)

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134
Project Location: ER/1333/58/Out
Phone: 284-3308
Date Results Needed: Normal
Suspect Isotopes:
Case Number: 7213.130

Hazards/Special Instructions:
Need EDD & Raw Data Package
Send copy of results to Ed Hignardot

Batch Log Number: 801850
Logged By: KS

Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass	Remarks / Aliquot Amount
42 622-002	S	9/8/98 1018	500ml	Gama Spec	01	<300	597g	
623		1023			02		552g	
624		1029			03		901g	
625		1030			04		790g	
627		1041			05		764g	
628		1044			06		673g	
629		1045			07		597g	
630		1046			08		455g	
632		1116			09		665g	
633		1117			10		917g	
634		1125			11		655g	
635		1126			12		797g	
638		1140			13		489g	

Relinquished by [signature] Date 9-8-98 Received by [signature] Date 9/8/98
Relinquished by [signature] Date 9/11/98 Received by [signature] Date 9/11/98
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134
Project Location: ER/1333/58/Dat
Phone: 284-3308
Date Results Needed: Normal
Suspect Isotopes:
Case Number: 7213.130

Hazards/Special Instructions:

see page 1

Batch Log Number: 801850
Logged By: KA

Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass	Remarks / Aliquot Amount
942639-002	S	9/8/98 1143	500ml	Gamma Spec	14	<300	710g	
636		1134			15		816g	
637		1137			16		699g	
626		1032			17		719g	
631		1114			18		853g	
LCS					19			

Relinquished by TA Date 9-8-98 Received by KA Date 9/8/98
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____

RPSD-0602-02.3

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-08-98 6:09:06 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042622-002
Lab Sample ID : 80185001

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 597.000 gram
Sample Date/Time : 9-08-98 10:18:00 AM
Acquire Start Date/Time : 9-08-98 4:26:18 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.17E-01	4.99E-01	7.11E-01
RA-226	1.59E+00	3.03E+00	6.74E-01
PB-214	6.31E-01	6.99E-01	5.90E-02
BI-214	5.71E-01	1.24E-01	4.86E-02
PB-210	Not Detected	---	4.33E+01
TH-232	8.16E-01	4.44E-01	1.72E-01
RA-228	8.58E-01	2.61E-01	1.43E-01
AC-228	8.55E-01	2.80E-01	3.03E-01
TH-228	6.91E-01	2.84E-01	6.18E-01
RA-224	7.99E-01	2.85E-01	7.58E-02
PB-212	8.50E-01	1.42E-01	4.64E-02
BI-212	9.56E-01	2.67E-01	3.23E-01
TL-208	7.01E-01	1.62E-01	7.96E-02
U-235	Not Detected	---	2.73E-01
TH-231	Not Detected	---	2.64E+00
PA-231	Not Detected	---	4.57E+00
TH-227	Not Detected	---	4.10E-01
RA-223	Not Detected	---	2.35E-01
RN-219	Not Detected	---	4.72E-01
PB-211	Not Detected	---	1.08E+00
TL-207	Not Detected	---	1.57E+01
AM-241	Not Detected	---	5.45E-01
PU-239	Not Detected	---	5.21E+02
NP-237	~~4.57E-01~~	~~2.43E-01~~	4.01E-01 Not detected 9/10/98
PA-233	Not Detected	---	6.82E-02
TH-229	Not Detected	---	3.01E-01

[Summary Report] - Sample ID: : 80185001

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.48E-02
AG-110m	Not Detected	---	1.11E-01
BA-133	Not Detected	---	7.61E-02
BE-7	1.86E-01	1.68E-01	2.18E-01
CD-109	Not Detected	---	1.36E+00
CD-115	Not Detected	---	8.45E-02
CE-139	Not Detected	---	3.34E-02
CE-141	Not Detected	---	6.17E-02
CE-144	Not Detected	---	2.83E-01
CO-56	Not Detected	---	3.60E-02
CO-57	Not Detected	---	3.47E-02
CO-58	Not Detected	---	3.48E-02
CO-60	Not Detected	---	3.72E-02
CR-51	Not Detected	---	2.85E-01
CS-134	Not Detected	---	5.24E-02
CS-137	1.35E+00	2.41E-01	2.71E-02
EU-152	Not Detected	---	1.05E-01
EU-154	Not Detected	---	2.06E-01
EU-155	Not Detected	---	1.75E-01
FE-59	Not Detected	---	7.90E-02
GD-153	Not Detected	---	1.25E-01
HG-203	Not Detected	---	3.92E-02
I-131	Not Detected	---	3.73E-02
IR-192	Not Detected	---	3.24E-02
K-40	1.82E+01	2.74E+00	2.85E-01
KR-85	Not Detected	---	9.88E+00
MN-52	Not Detected	---	3.35E-02
MN-54	Not Detected	---	3.68E-02
MO-99	Not Detected	---	2.74E-01
NA-22	Not Detected	---	4.45E-02
NA-24	Not Detected	---	4.58E-02
NB-95	Not Detected	---	1.99E-01
ND-147	Not Detected	---	2.45E-01
NI-57	Not Detected	---	3.16E-02
NP-239	Not Detected	---	1.56E-01
RU-103	Not Detected	---	3.52E-02
RU-106	Not Detected	---	3.21E-01
SB-122	Not Detected	---	5.03E-02
SB-124	Not Detected	---	3.45E-02
SB-125	Not Detected	---	1.09E-01
SN-113	Not Detected	---	4.63E-02
TA-182	Not Detected	---	1.62E-01
TA-183	Not Detected	---	4.86E-01
TC-99m	Not Detected	---	7.54E-02
TL-201	Not Detected	---	2.23E-01
XE-133	Not Detected	---	1.81E-01
Y-88	Not Detected	---	2.58E-02
ZN-65	Not Detected	---	1.10E-01
ZR-95	Not Detected	---	6.33E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-08-98 7:53:55 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042623-002
Lab Sample ID : 80185002

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 552.000 gram
Sample Date/Time : 9-08-98 10:23:00 AM
Acquire Start Date/Time : 9-08-98 6:11:14 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.01E+00
RA-226	1.71E+00	7.81E-01	7.08E-01
PB-214	8.07E-01	2.22E-01	6.09E-02
BI-214	7.17E-01	2.95E-01	5.78E-02
PB-210	Not Detected	---	4.48E+01
TH-232	1.04E+00	5.31E-01	1.83E-01
RA-228	1.04E+00	3.54E-01	1.96E-01
AC-228	1.07E+00	4.27E-01	3.30E-01
TH-228	1.09E+00	2.84E-01	5.92E-01
RA-224	1.00E+00	3.27E-01	8.59E-02
PB-212	1.05E+00	3.08E-01	5.28E-02
BI-212	1.45E+00	5.72E-01	3.67E-01
TL-208	9.50E-01	1.86E-01	8.43E-02
U-235	Not Detected	---	2.94E-01
TH-231	Not Detected	---	3.02E+00
PA-231	Not Detected	---	5.01E+00
TH-227	Not Detected	---	4.60E-01
RA-223	Not Detected	---	2.61E-01
RN-219	Not Detected	---	5.13E-01
PB-211	Not Detected	---	1.15E+00
TL-207	Not Detected	---	1.66E+01
AM-241	Not Detected	---	6.02E-01
PU-239	Not Detected	---	5.62E+02
NP-237	Not Detected	---	4.13E-01
PA-233	Not Detected	---	7.67E-02
TH-229	Not Detected	---	3.12E-01

[Summary Report] - Sample ID: : 80185002

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	5.21E-02
AG-110m	Not Detected	---	1.10E-01
BA-133	Not Detected	---	8.52E-02
BE-7	Not Detected	---	3.55E-01
CD-109	Not Detected	---	1.40E+00
CD-115	Not Detected	---	9.62E-02
CE-139	Not Detected	---	3.78E-02
CE-141	Not Detected	---	6.67E-02
CE-144	Not Detected	---	3.01E-01
CO-56	Not Detected	---	4.09E-02
CO-57	Not Detected	---	3.79E-02
CO-58	Not Detected	---	3.98E-02
CO-60	Not Detected	---	4.01E-02
CR-51	Not Detected	---	3.04E-01
CS-134	Not Detected	---	5.97E-02
CS-137	1.20E+00	1.78E-01	2.84E-02
EU-152	Not Detected	---	1.14E-01
EU-154	Not Detected	---	2.39E-01
EU-155	Not Detected	---	1.94E-01
FE-59	Not Detected	---	8.65E-02
GD-153	Not Detected	---	1.30E-01
HG-203	Not Detected	---	4.08E-02
I-131	Not Detected	---	3.92E-02
IR-192	Not Detected	---	3.59E-02
K-40	1.98E+01	2.95E+00	3.05E-01
KR-85	Not Detected	---	1.08E+01
MN-52	Not Detected	---	3.45E-02
MN-54	Not Detected	---	4.19E-02
MO-99	Not Detected	---	3.19E-01
NA-22	Not Detected	---	5.06E-02
NA-24	Not Detected	---	5.65E-02
NB-95	Not Detected	---	2.27E-01
ND-147	Not Detected	---	2.60E-01
NI-57	Not Detected	---	3.40E-02
NP-239	Not Detected	---	1.74E-01
RU-103	Not Detected	---	3.94E-02
RU-106	Not Detected	---	3.72E-01
SB-122	Not Detected	---	5.27E-02
SB-124	Not Detected	---	3.82E-02
SB-125	Not Detected	---	1.15E-01
SN-113	Not Detected	---	5.12E-02
TA-182	Not Detected	---	1.78E-01
TA-183	Not Detected	---	5.38E-01
TC-99m	Not Detected	---	9.81E-02
TL-201	Not Detected	---	2.38E-01
XE-133	Not Detected	---	2.06E-01
Y-88	Not Detected	---	2.72E-02
ZN-65	Not Detected	---	1.22E-01
ZR-95	Not Detected	---	6.82E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-08-98 9:38:52 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042624-002
Lab Sample ID : 80185003

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 901.000 gram
Sample Date/Time : 9-08-98 10:29:00 AM
Acquire Start Date/Time : 9-08-98 7:56:04 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.95E-01
RA-226	1.48E+00	7.31E-01	5.54E-01
PB-214	5.28E-01	1.61E-01	3.79E-02
BI-214	4.43E-01	1.31E-01	3.85E-02
PB-210	Not Detected	---	2.98E+01
TH-232	7.40E-01	3.85E-01	1.24E-01
RA-228	6.81E-01	7.17E-01	1.36E-01
AC-228	7.71E-01	2.05E-01	2.06E-01
TH-228	5.96E-01	2.08E-01	4.16E-01
RA-224	7.27E-01	2.01E-01	5.15E-02
PB-212	7.21E-01	8.60E-01	3.40E-02
BI-212	6.99E-01	4.41E-01	2.65E-01
TL-208	6.28E-01	4.06E-01	5.07E-02
U-235	Not Detected	---	2.08E-01
TH-231	Not Detected	---	2.05E+00
PA-231	Not Detected	---	3.45E+00
TH-227	Not Detected	---	3.01E-01
RA-223	Not Detected	---	1.78E-01
RN-219	Not Detected	---	3.36E-01
PB-211	Not Detected	---	7.40E-01
TL-207	Not Detected	---	1.21E+01
AM-241	Not Detected	---	4.16E-01
PU-239	Not Detected	---	4.03E+02
NP-237	Not Detected	---	2.87E-01
PA-233	Not Detected	---	5.16E-02
TH-229	Not Detected	---	2.27E-01

[Summary Report] - Sample ID: : 80185003

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.49E-02
AG-110m	Not Detected	---	5.11E-02
BA-133	Not Detected	---	5.38E-02
BE-7	Not Detected	---	2.32E-01
CD-109	Not Detected	---	9.72E-01
CD-115	Not Detected	---	6.52E-02
CE-139	Not Detected	---	2.61E-02
CE-141	Not Detected	---	4.72E-02
CE-144	Not Detected	---	2.17E-01
CO-56	Not Detected	---	2.78E-02
CO-57	Not Detected	---	2.69E-02
CO-58	Not Detected	---	2.91E-02
CO-60	Not Detected	---	3.23E-02
CR-51	Not Detected	---	2.04E-01
CS-134	Not Detected	---	3.76E-02
CS-137	3.35E-01	1.80E-01	2.06E-02
EU-152	Not Detected	---	8.10E-02
EU-154	Not Detected	---	1.60E-01
EU-155	Not Detected	---	1.37E-01
FE-59	Not Detected	---	6.31E-02
GD-153	Not Detected	---	9.56E-02
HG-203	Not Detected	---	2.78E-02
I-131	Not Detected	---	2.68E-02
IR-192	Not Detected	---	2.44E-02
K-40	1.96E+01	2.84E+00	1.97E-01
KR-85	Not Detected	---	7.11E+00
MN-52	Not Detected	---	2.63E-02
MN-54	Not Detected	---	2.87E-02
MO-99	Not Detected	---	2.30E-01
NA-22	Not Detected	---	3.90E-02
NA-24	Not Detected	---	4.27E-02
NB-95	Not Detected	---	1.50E-01
ND-147	Not Detected	---	1.69E-01
NI-57	Not Detected	---	4.54E-02
NP-239	Not Detected	---	1.24E-01
RU-103	Not Detected	---	2.52E-02
RU-106	Not Detected	---	2.48E-01
SB-122	Not Detected	---	3.75E-02
SB-124	Not Detected	---	2.47E-02
SB-125	Not Detected	---	7.13E-02
SN-113	Not Detected	---	3.39E-02
TA-182	Not Detected	---	1.28E-01
TA-183	Not Detected	---	3.80E-01
TC-99m	Not Detected	---	8.41E-02
TL-201	Not Detected	---	1.75E-01
XE-133	Not Detected	---	1.42E-01
Y-88	Not Detected	---	1.90E-02
ZN-65	Not Detected	---	8.80E-02
ZR-95	Not Detected	---	4.82E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-08-98 11:23:58 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042625-002
Lab Sample ID : 80185004

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 790.000 gram
Sample Date/Time : 9-08-98 10:30:00 AM
Acquire Start Date/Time : 9-08-98 9:41:07 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.71E-01	5.20E-01	6.53E-01
RA-226	1.41E+00	7.12E-01	5.59E-01
PB-214	5.67E-01	1.06E-01	4.54E-02
BI-214	5.06E-01	3.29E-01	4.37E-02
PB-210	Not Detected	---	3.35E+01
TH-232	7.25E-01	3.60E-01	1.38E-01
RA-228	8.83E-01	2.47E-01	1.49E-01
AC-228	7.97E-01	3.13E-01	2.32E-01
TH-228	8.99E-01	2.61E-01	4.52E-01
RA-224	7.29E-01	2.27E-01	5.96E-02
PB-212	7.38E-01	3.60E-01	3.81E-02
BI-212	7.56E-01	3.04E-01	2.85E-01
TL-208	7.16E-01	1.60E-01	6.08E-02
U-235	Not Detected	---	2.25E-01
TH-231	Not Detected	---	2.27E+00
PA-231	Not Detected	---	3.72E+00
TH-227	Not Detected	---	3.32E-01
RA-223	Not Detected	---	1.92E-01
RN-219	Not Detected	---	3.77E-01
PB-211	Not Detected	---	8.34E-01
TL-207	Not Detected	---	1.25E+01
AM-241	Not Detected	---	4.38E-01
PU-239	Not Detected	---	4.22E+02
NP-237	~~5.31E-01~~	~~2.89E-01~~	3.39E-01
PA-233	Not Detected	---	5.58E-02
TH-229	Not Detected	---	2.39E-01

Not detected 9/10/98

[Summary Report] - Sample ID: : 80185004

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.75E-02
AG-110m	Not Detected	---	7.02E-02
BA-133	Not Detected	---	5.97E-02
BE-7	Not Detected	---	1.38E-01
CD-109	Not Detected	---	1.15E+00
CD-115	Not Detected	---	7.24E-02
CE-139	Not Detected	---	2.79E-02
CE-141	Not Detected	---	5.10E-02
CE-144	Not Detected	---	2.34E-01
CO-56	Not Detected	---	3.18E-02
CO-57	Not Detected	---	2.92E-02
CO-58	Not Detected	---	2.79E-02
CO-60	Not Detected	---	3.50E-02
CR-51	Not Detected	---	2.29E-01
CS-134	Not Detected	---	4.22E-02
CS-137	6.64E-01	1.06E-01	2.28E-02
EU-152	Not Detected	---	8.79E-02
EU-154	Not Detected	---	1.73E-01
EU-155	Not Detected	---	1.47E-01
FE-59	Not Detected	---	7.06E-02
GD-153	Not Detected	---	1.03E-01
HG-203	Not Detected	---	3.03E-02
I-131	Not Detected	---	2.84E-02
IR-192	Not Detected	---	2.68E-02
K-40	2.12E+01	3.04E+00	1.97E-01
KR-85	Not Detected	---	7.82E+00
MN-52	Not Detected	---	2.88E-02
MN-54	Not Detected	---	3.20E-02
MO-99	Not Detected	---	2.37E-01
NA-22	Not Detected	---	3.95E-02
NA-24	Not Detected	---	4.91E-02
NB-95	Not Detected	---	1.68E-01
ND-147	Not Detected	---	1.94E-01
NI-57	Not Detected	---	3.05E-02
NP-239	Not Detected	---	1.31E-01
RU-103	Not Detected	---	2.80E-02
RU-106	Not Detected	---	2.67E-01
SB-122	Not Detected	---	4.14E-02
SB-124	Not Detected	---	2.83E-02
SB-125	Not Detected	---	8.42E-02
SN-113	Not Detected	---	3.61E-02
TA-182	Not Detected	---	1.38E-01
TA-183	Not Detected	---	3.95E-01
TC-99m	Not Detected	---	1.12E-01
TL-201	Not Detected	---	1.99E-01
XE-133	Not Detected	---	1.56E-01
Y-88	Not Detected	---	2.21E-02
ZN-65	Not Detected	---	9.38E-02
ZR-95	Not Detected	---	5.29E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-10-98 11:01:21 AM *
****

* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042627-002
Lab Sample ID : 80185005

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 764.000 gram
Sample Date/Time : 9-08-98 10:41:00 AM
Acquire Start Date/Time : 9-08-98 11:26:19 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	1.05E+00	5.94E-01	6.83E-01
RA-226	1.64E+00	3.83E-01	6.06E-01
PB-214	6.66E-01	1.22E-01	4.99E-02
BI-214	6.32E-01	1.36E-01	4.29E-02
PB-210	Not Detected	---	3.34E+01
TH-232	9.87E-01	4.92E-01	1.61E-01
RA-228	9.82E-01	2.59E-01	1.45E-01
AC-228	9.34E-01	2.43E-01	2.39E-01
TH-228	6.80E-01	2.42E-01	5.29E-01
RA-224	9.13E-01	2.78E-01	7.00E-02
PB-212	9.05E-01	1.52E-01	4.04E-02
BI-212	9.31E-01	5.26E-01	2.59E-01
TL-208	8.69E-01	3.20E-01	5.96E-02
U-235	3.20E-01	2.13E-01	2.47E-01
TH-231	Not Detected	---	2.35E+00
PA-231	Not Detected	---	3.95E+00
TH-227	Not Detected	---	3.67E-01
RA-223	Not Detected	---	2.08E-01
RN-219	Not Detected	---	3.91E-01
PB-211	Not Detected	---	8.93E-01
TL-207	Not Detected	---	1.33E+01
AM-241	Not Detected	---	4.81E-01
PU-239	Not Detected	---	4.53E+02
NP-237	~~6.70E-01~~	~~2.54E-01~~	3.70E-01 not detected
PA-233	Not Detected	---	6.01E-02
TH-229	Not Detected	---	2.61E-01

9/10/98

[Summary Report] - Sample ID: : 80185005

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.96E-02
AG-110m	Not Detected	---	7.30E-02
BA-133	Not Detected	---	6.59E-02
BE-7	Not Detected	---	2.83E-01
CD-109	Not Detected	---	1.26E+00
CD-115	Not Detected	---	8.27E-02
CE-139	Not Detected	---	3.01E-02
CE-141	Not Detected	---	5.50E-02
CE-144	Not Detected	---	2.48E-01
CO-56	Not Detected	---	3.37E-02
CO-57	Not Detected	---	3.06E-02
CO-58	Not Detected	---	3.17E-02
CO-60	Not Detected	---	3.57E-02
CR-51	Not Detected	---	2.43E-01
CS-134	Not Detected	---	4.59E-02
CS-137	6.81E-01	2.15E-01	2.42E-02
EU-152	Not Detected	---	9.21E-02
EU-154	Not Detected	---	1.82E-01
EU-155	Not Detected	---	1.52E-01
FE-59	Not Detected	---	7.17E-02
GD-153	Not Detected	---	1.08E-01
HG-203	Not Detected	---	3.26E-02
I-131	Not Detected	---	3.07E-02
IR-192	Not Detected	---	2.86E-02
K-40	1.92E+01	2.83E+00	2.45E-01
KR-85	Not Detected	---	8.33E+00
MN-52	Not Detected	---	2.86E-02
MN-54	Not Detected	---	3.41E-02
MO-99	Not Detected	---	2.61E-01
NA-22	Not Detected	---	4.25E-02
NA-24	Not Detected	---	5.76E-02
NB-95	Not Detected	---	1.88E-01
ND-147	Not Detected	---	2.07E-01
NI-57	Not Detected	---	3.27E-02
NP-239	Not Detected	---	1.37E-01
RU-103	Not Detected	---	3.07E-02
RU-106	Not Detected	---	2.77E-01
SB-122	Not Detected	---	4.81E-02
SB-124	Not Detected	---	2.89E-02
SB-125	Not Detected	---	8.84E-02
SN-113	Not Detected	---	3.99E-02
TA-182	Not Detected	---	1.45E-01
TA-183	Not Detected	---	4.42E-01
TC-99m	Not Detected	---	1.42E-01
TL-201	Not Detected	---	2.08E-01
XE-133	Not Detected	---	1.74E-01
Y-88	Not Detected	---	2.07E-02
ZN-65	Not Detected	---	1.00E-01
ZR-95	Not Detected	---	5.51E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-09-98 8:47:59 AM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042628-002
Lab Sample ID : 80185006

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 673.000 gram
Sample Date/Time : 9-08-98 10:44:00 AM
Acquire Start Date/Time : 9-09-98 7:05:05 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	8.08E-01	5.21E-01	6.98E-01
RA-226	1.88E+00	7.94E-01	6.96E-01
PB-214	7.48E-01	1.42E-01	5.12E-02
BI-214	6.24E-01	1.24E-01	4.85E-02
PB-210	Not Detected	---	3.81E+01
TH-232	7.87E-01	1.56E+00	1.75E-01
RA-228	8.77E-01	2.64E-01	1.52E-01
AC-228	9.38E-01	2.78E-01	2.71E-01
TH-228	6.91E-01	2.50E-01	5.41E-01
RA-224	8.32E-01	2.88E-01	7.30E-02
PB-212	8.79E-01	1.57E-01	4.43E-02
BI-212	8.56E-01	3.24E-01	2.86E-01
TL-208	7.06E-01	1.55E-01	7.51E-02
U-235	Not Detected	---	2.54E-01
TH-231	Not Detected	---	2.60E+00
PA-231	Not Detected	---	4.47E+00
TH-227	Not Detected	---	3.87E-01
RA-223	Not Detected	---	2.28E-01
RN-219	Not Detected	---	4.36E-01
PB-211	Not Detected	---	1.01E+00
TL-207	Not Detected	---	1.32E+01
AM-241	Not Detected	---	3.61E-01
PU-239	Not Detected	---	5.16E+02
NP-237	~~5.45E-01~~	~~2.33E-01~~	3.88E-01 Not detected 9/10/98
PA-233	Not Detected	---	6.84E-02
TH-229	Not Detected	---	2.91E-01

[Summary Report] - Sample ID: : 80185006

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.28E-02
AG-110m	Not Detected	---	1.06E-01
BA-133	Not Detected	---	7.37E-02
BE-7	Not Detected	---	3.13E-01
CD-109	Not Detected	---	1.32E+00
CD-115	Not Detected	---	9.91E-02
CE-139	Not Detected	---	3.30E-02
CE-141	Not Detected	---	5.87E-02
CE-144	Not Detected	---	2.71E-01
CO-56	Not Detected	---	3.42E-02
CO-57	Not Detected	---	3.37E-02
CO-58	Not Detected	---	3.30E-02
CO-60	Not Detected	---	3.84E-02
CR-51	Not Detected	---	2.75E-01
CS-134	Not Detected	---	5.00E-02
CS-137	1.38E+00	1.99E-01	2.42E-02
EU-152	Not Detected	---	1.01E-01
EU-154	Not Detected	---	1.96E-01
EU-155	Not Detected	---	1.70E-01
FE-59	Not Detected	---	7.70E-02
GD-153	Not Detected	---	1.19E-01
HG-203	Not Detected	---	3.60E-02
I-131	Not Detected	---	3.74E-02
IR-192	Not Detected	---	3.24E-02
K-40	1.99E+01	4.10E+00	2.79E-01
KR-85	Not Detected	---	9.15E+00
MN-52	Not Detected	---	3.02E-02
MN-54	Not Detected	---	3.79E-02
MO-99	Not Detected	---	3.05E-01
NA-22	Not Detected	---	4.48E-02
NA-24	Not Detected	---	8.92E-02
NB-95	Not Detected	---	2.11E-01
ND-147	Not Detected	---	2.37E-01
NI-57	Not Detected	---	3.78E-02
NP-239	Not Detected	---	1.52E-01
RU-103	Not Detected	---	3.35E-02
RU-106	Not Detected	---	3.09E-01
SB-122	Not Detected	---	2.36E-02
SB-124	Not Detected	---	3.25E-02
SB-125	Not Detected	---	1.00E-01
SN-113	Not Detected	---	4.45E-02
TA-182	Not Detected	---	1.59E-01
TA-183	Not Detected	---	5.28E-01
TC-99m	Not Detected	---	3.65E-01
TL-201	Not Detected	---	2.41E-01
XE-133	Not Detected	---	2.13E-01
Y-88	Not Detected	---	2.67E-02
ZN-65	Not Detected	---	1.06E-01
ZR-95	Not Detected	---	6.11E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 11:46:27 AM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042629-002
Lab Sample ID : 80185007

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 597.000 gram
Sample Date/Time : 9-08-98 10:45:00 AM
Acquire Start Date/Time : 9-09-98 8:50:13 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.81E-01	6.53E-01	7.96E-01
RA-226	1.91E+00	6.93E-01	6.69E-01
PB-214	6.98E-01	1.51E-01	5.57E-02
BI-214	5.89E-01	2.46E-01	5.15E-02
PB-210	Not Detected	---	4.16E+01
TH-232	8.12E-01	3.97E-01	1.74E-01
RA-228	7.96E-01	2.90E-01	1.87E-01
AC-228	9.21E-01	2.84E-01	3.04E-01
TH-228	9.22E-01	2.94E-01	5.74E-01
RA-224	8.66E-01	2.71E-01	6.89E-02
PB-212	8.24E-01	1.44E-01	4.79E-02
BI-212	9.72E-01	4.17E-01	3.15E-01
TL-208	7.60E-01	3.07E-01	7.79E-02
U-235	Not Detected	---	2.73E-01
TH-231	Not Detected	---	2.71E+00
PA-231	Not Detected	---	4.63E+00
TH-227	Not Detected	---	4.06E-01
RA-223	Not Detected	---	2.31E-01
RN-219	Not Detected	---	4.49E-01
PB-211	Not Detected	---	1.01E+00
TL-207	Not Detected	---	1.46E+01
AM-241	Not Detected	---	5.60E-01
PU-239	Not Detected	---	5.25E+02
NP-237	Not Detected	---	4.23E-01
PA-233	Not Detected	---	6.97E-02
TH-229	Not Detected	---	2.92E-01

[Summary Report] - Sample ID: : 80185007

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.47E-02
AG-110m	Not Detected	---	9.05E-02
BA-133	Not Detected	---	7.67E-02
BE-7	Not Detected	---	3.20E-01
CD-109	~~2.27E+00~~	~~1.40E+00~~	1.44E+00
CD-115	Not Detected	---	1.03E-01
CE-139	Not Detected	---	3.43E-02
CE-141	Not Detected	---	6.27E-02
CE-144	Not Detected	---	2.80E-01
CO-56	Not Detected	---	3.97E-02
CO-57	Not Detected	---	3.54E-02
CO-58	Not Detected	---	3.71E-02
CO-60	Not Detected	---	3.78E-02
CR-51	Not Detected	---	2.79E-01
CS-134	Not Detected	---	5.16E-02
CS-137	8.42E-01	1.31E-01	2.65E-02
EU-152	Not Detected	---	1.07E-01
EU-154	Not Detected	---	2.04E-01
EU-155	Not Detected	---	1.71E-01
FE-59	Not Detected	---	7.74E-02
GD-153	Not Detected	---	1.23E-01
HG-203	Not Detected	---	3.77E-02
I-131	Not Detected	---	3.64E-02
IR-192	Not Detected	---	3.23E-02
K-40	2.14E+01	3.17E+00	3.11E-01
KR-85	Not Detected	---	9.70E+00
MN-52	Not Detected	---	3.57E-02
MN-54	Not Detected	---	3.97E-02
MO-99	Not Detected	---	3.38E-01
NA-22	Not Detected	---	5.10E-02
NA-24	Not Detected	---	1.05E-01
NB-95	Not Detected	---	2.24E-01
ND-147	Not Detected	---	2.42E-01
NI-57	Not Detected	---	5.45E-02
NP-239	Not Detected	---	1.53E-01
RU-103	Not Detected	---	3.52E-02
RU-106	Not Detected	---	3.17E-01
SB-122	Not Detected	---	5.93E-02
SB-124	Not Detected	---	3.42E-02
SB-125	Not Detected	---	1.01E-01
SN-113	Not Detected	---	4.53E-02
TA-182	Not Detected	---	1.71E-01
TA-183	Not Detected	---	5.44E-01
TC-99m	Not Detected	---	4.77E-01
TL-201	Not Detected	---	2.55E-01
XE-133	Not Detected	---	2.14E-01
Y-88	Not Detected	---	2.63E-02
ZN-65	Not Detected	---	1.14E-01
ZR-95	Not Detected	---	6.53E-02

Not detected

9/10/98

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-09-98 12:20:36 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042630-002
Lab Sample ID : 80185008

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 456.000 gram
Sample Date/Time : 9-08-98 10:46:00 AM
Acquire Start Date/Time : 9-09-98 10:37:46 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	8.06E-01
RA-226	2.25E+00	1.12E+00	1.00E+00
PB-214	9.84E-01	1.70E-01	7.19E-02
BI-214	8.20E-01	2.89E-01	7.19E-02
PB-210	Not Detected	---	5.27E+01
TH-232	1.33E+00	7.04E-01	2.27E-01
RA-228	1.21E+00	3.16E-01	2.18E-01
AC-228	1.24E+00	4.07E-01	3.97E-01
TH-228	1.14E+00	4.25E-01	8.16E-01
RA-224	1.20E+00	4.19E-01	8.42E-02
PB-212	1.19E+00	1.43E+00	6.50E-02
BI-212	1.45E+00	6.83E-01	4.63E-01
TL-208	1.13E+00	1.38E+00	9.70E-02
U-235	3.09E-01	3.01E-01	3.53E-01
TH-231	Not Detected	---	3.64E+00
PA-231	Not Detected	---	5.98E+00
TH-227	Not Detected	---	5.53E-01
RA-223	Not Detected	---	2.99E-01
RN-219	Not Detected	---	6.10E-01
PB-211	Not Detected	---	1.40E+00
TL-207	Not Detected	---	1.94E+01
AM-241	Not Detected	---	7.32E-01
PU-239	Not Detected	---	6.73E+02
NP-237	Not Detected	---	4.96E-01
PA-233	Not Detected	---	9.35E-02
TH-229	Not Detected	---	3.84E-01

[Summary Report] - Sample ID: : 80185008

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	6.05E-02
AG-110m	Not Detected	---	1.54E-01
BA-133	Not Detected	---	1.03E-01
BE-7	Not Detected	---	4.57E-01
CD-109	Not Detected	---	1.68E+00
CD-115	Not Detected	---	1.44E-01
CE-139	Not Detected	---	4.39E-02
CE-141	Not Detected	---	8.08E-02
CE-144	Not Detected	---	3.65E-01
CO-56	Not Detected	---	4.84E-02
CO-57	Not Detected	---	4.51E-02
CO-58	Not Detected	---	4.55E-02
CO-60	Not Detected	---	5.11E-02
CR-51	Not Detected	---	3.79E-01
CS-134	Not Detected	---	6.98E-02
CS-137	2.00E+00	2.88E-01	3.51E-02
EU-152	Not Detected	---	1.36E-01
EU-154	Not Detected	---	2.78E-01
EU-155	Not Detected	---	2.25E-01
FE-59	Not Detected	---	1.07E-01
GD-153	Not Detected	---	1.56E-01
HG-203	Not Detected	---	5.01E-02
I-131	Not Detected	---	5.29E-02
IR-192	Not Detected	---	4.35E-02
K-40	2.22E+01	3.35E+00	3.98E-01
KR-85	Not Detected	---	1.31E+01
MN-52	Not Detected	---	4.48E-02
MN-54	Not Detected	---	2.76E-02
MO-99	Not Detected	---	4.45E-01
NA-22	Not Detected	---	6.16E-02
NA-24	Not Detected	---	1.45E-01
NB-95	Not Detected	---	3.10E-01
ND-147	Not Detected	---	3.37E-01
NI-57	Not Detected	---	1.09E-01
NP-239	Not Detected	---	2.00E-01
RU-103	Not Detected	---	4.74E-02
RU-106	Not Detected	---	4.50E-01
SB-122	Not Detected	---	7.80E-02
SB-124	Not Detected	---	4.67E-02
SB-125	Not Detected	---	1.39E-01
SN-113	Not Detected	---	6.45E-02
TA-182	Not Detected	---	2.19E-01
TA-183	Not Detected	---	7.21E-01
TC-99m	Not Detected	---	7.42E-01
TL-201	Not Detected	---	3.41E-01
XE-133	Not Detected	---	2.76E-01
Y-88	Not Detected	---	3.76E-02
ZN-65	Not Detected	---	1.46E-01
ZR-95	Not Detected	---	8.08E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 12:09:38 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042632-002
Lab Sample ID : 80185009

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 665.000 gram
Sample Date/Time : 9-08-98 11:16:00 AM
Acquire Start Date/Time : 9-09-98 12:22:53 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	4.04E-01	4.14E-01	6.81E-01
RA-226	1.97E+00	7.09E-01	6.61E-01
PB-214	7.08E-01	1.35E-01	5.24E-02
BI-214	6.36E-01	1.35E-01	4.88E-02
PB-210	Not Detected	---	3.81E+01
TH-232	8.41E-01	4.04E-01	1.67E-01
RA-228	1.08E+00	2.97E-01	1.41E-01
AC-228	8.68E-01	4.64E-01	2.77E-01
TH-228	7.27E-01	2.60E-01	4.89E-01
RA-224	8.43E-01	2.89E-01	7.45E-02
PB-212	8.50E-01	3.17E-01	4.43E-02
BI-212	1.07E+00	3.56E-01	2.80E-01
TL-208	8.41E-01	1.67E-01	6.47E-02
U-235	Not Detected	---	2.63E-01
TH-231	Not Detected	---	2.60E+00
PA-231	Not Detected	---	4.28E+00
TH-227	Not Detected	---	3.83E-01
RA-223	Not Detected	---	2.37E-01
RN-219	Not Detected	---	4.42E-01
PB-211	Not Detected	---	9.95E-01
TL-207	Not Detected	---	1.39E+01
AM-241	Not Detected	---	5.19E-01
PU-239	Not Detected	---	4.88E+02
NP-237	~~5.14E-01~~	~~2.28E-01~~	3.43E-01 Not detected 9/10/98
PA-233	Not Detected	---	6.53E-02
TH-229	Not Detected	---	2.79E-01

[Summary Report] - Sample ID: : 80185009

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.28E-02
AG-110m	Not Detected	---	9.44E-02
BA-133	Not Detected	---	7.23E-02
BE-7	3.64E-01	3.73E-01	2.27E-01
CD-109	Not Detected	---	1.16E+00
CD-115	Not Detected	---	1.05E-01
CE-139	Not Detected	---	3.24E-02
CE-141	Not Detected	---	6.07E-02
CE-144	Not Detected	---	2.69E-01
CO-56	Not Detected	---	3.65E-02
CO-57	Not Detected	---	3.32E-02
CO-58	Not Detected	---	3.17E-02
CO-60	Not Detected	---	3.91E-02
CR-51	Not Detected	---	2.73E-01
CS-134	Not Detected	---	5.05E-02
CS-137	1.05E+00	1.70E-01	2.60E-02
EU-152	Not Detected	---	1.00E-01
EU-154	Not Detected	---	1.97E-01
EU-155	Not Detected	---	1.66E-01
FE-59	Not Detected	---	7.57E-02
GD-153	Not Detected	---	1.20E-01
HG-203	Not Detected	---	3.49E-02
I-131	Not Detected	---	3.55E-02
IR-192	Not Detected	---	3.15E-02
K-40	1.95E+01	2.90E+00	2.45E-01
KR-85	Not Detected	---	9.25E+00
MN-52	Not Detected	---	3.50E-02
MN-54	Not Detected	---	3.68E-02
MO-99	Not Detected	---	3.21E-01
NA-22	Not Detected	---	4.60E-02
NA-24	Not Detected	---	1.13E-01
NB-95	Not Detected	---	2.17E-01
ND-147	Not Detected	---	2.49E-01
NI-57	Not Detected	---	7.41E-02
NP-239	Not Detected	---	1.49E-01
RU-103	Not Detected	---	3.40E-02
RU-106	Not Detected	---	3.21E-01
SB-122	Not Detected	---	5.76E-02
SB-124	Not Detected	---	3.19E-02
SB-125	Not Detected	---	9.74E-02
SN-113	Not Detected	---	4.43E-02
TA-182	Not Detected	---	1.56E-01
TA-183	Not Detected	---	5.14E-01
TC-99m	Not Detected	---	6.23E-01
TL-201	Not Detected	---	2.52E-01
XE-133	Not Detected	---	2.23E-01
Y-88	Not Detected	---	2.81E-02
ZN-65	Not Detected	---	1.05E-01
ZR-95	Not Detected	---	5.82E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-09-98 3:52:09 PM *
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* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
****

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042633-002
Lab Sample ID : 80185010

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 917.000 gram
Sample Date/Time : 9-08-98 11:17:00 AM
Acquire Start Date/Time : 9-09-98 2:09:16 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.07E-01	4.24E-01	5.87E-01
RA-226	1.64E+00	9.00E-01	5.78E-01
PB-214	6.37E-01	1.10E-01	4.13E-02
BI-214	5.78E-01	2.14E-01	3.57E-02
PB-210	Not Detected	---	3.08E+01
TH-232	8.27E-01	3.99E-01	1.32E-01
RA-228	7.59E-01	2.51E-01	1.33E-01
AC-228	8.61E-01	2.45E-01	2.01E-01
TH-228	9.62E-01	2.81E-01	4.66E-01
RA-224	8.48E-01	2.61E-01	5.43E-02
PB-212	8.01E-01	1.89E-01	3.64E-02
BI-212	7.19E-01	7.06E-01	2.72E-01
TL-208	7.02E-01	1.28E-01	5.63E-02
U-235	Not Detected	---	2.09E-01
TH-231	Not Detected	---	2.11E+00
PA-231	Not Detected	---	3.50E+00
TH-227	Not Detected	---	3.16E-01
RA-223	Not Detected	---	1.92E-01
RN-219	Not Detected	---	3.45E-01
PB-211	Not Detected	---	7.83E-01
TL-207	Not Detected	---	1.14E+01
AM-241	Not Detected	---	4.54E-01
PU-239	Not Detected	---	4.03E+02
NP-237	Not Detected	---	3.20E-01
PA-233	Not Detected	---	5.44E-02
TH-229	Not Detected	---	2.31E-01

[Summary Report] - Sample ID: : 80185010

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.46E-02
AG-110m	Not Detected	---	6.29E-02
BA-133	Not Detected	---	5.86E-02
BE-7	2.06E-01	2.07E-01	1.58E-01
CD-109	~~2.09E+00~~	~~8.20E-01~~	1.09E+00 Not detected 9/10/98
CD-115	Not Detected	---	8.63E-02
CE-139	Not Detected	---	2.70E-02
CE-141	Not Detected	---	4.84E-02
CE-144	Not Detected	---	2.21E-01
CO-56	Not Detected	---	2.75E-02
CO-57	Not Detected	---	2.78E-02
CO-58	Not Detected	---	2.67E-02
CO-60	Not Detected	---	3.19E-02
CR-51	Not Detected	---	2.15E-01
CS-134	Not Detected	---	4.03E-02
CS-137	6.11E-01	9.89E-02	1.66E-02
EU-152	Not Detected	---	8.36E-02
EU-154	Not Detected	---	1.59E-01
EU-155	Not Detected	---	1.35E-01
FE-59	Not Detected	---	6.34E-02
GD-153	Not Detected	---	9.44E-02
HG-203	Not Detected	---	2.87E-02
I-131	Not Detected	---	2.84E-02
IR-192	Not Detected	---	2.50E-02
K-40	1.88E+01	2.70E+00	2.09E-01
KR-85	Not Detected	---	7.14E+00
MN-52	Not Detected	---	2.96E-02
MN-54	Not Detected	---	2.95E-02
MO-99	Not Detected	---	2.71E-01
NA-22	Not Detected	---	3.58E-02
NA-24	Not Detected	---	9.86E-02
NB-95	Not Detected	---	1.81E-01
ND-147	Not Detected	---	1.87E-01
NI-57	Not Detected	---	3.52E-02
NP-239	Not Detected	---	1.21E-01
RU-103	Not Detected	---	2.61E-02
RU-106	Not Detected	---	2.46E-01
SB-122	Not Detected	---	4.59E-02
SB-124	Not Detected	---	2.51E-02
SB-125	Not Detected	---	7.54E-02
SN-113	Not Detected	---	3.41E-02
TA-182	Not Detected	---	1.26E-01
TA-183	Not Detected	---	4.53E-01
TC-99m	Not Detected	---	6.35E-01
TL-201	Not Detected	---	2.10E-01
XE-133	Not Detected	---	1.86E-01
Y-88	Not Detected	---	2.04E-02
ZN-65	Not Detected	---	8.89E-02
ZR-95	Not Detected	---	4.88E-02

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*
Sandia National Laboratories
*
Radiation Protection Sample Diagnostics Program [806 Laboratory]
*
9-10-98 12:35:53 PM
*
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*
* Analyzed by: 9/10/98 Reviewed by: 9/11/98 *
****

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042634-002
Lab Sample ID : 80185011

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 655.000 gram
Sample Date/Time : 9-08-98 11:25:00 AM
Acquire Start Date/Time : 9-09-98 7:44:21 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	8.00E-01	5.26E-01	6.94E-01
RA-226	1.59E+00	8.59E-01	7.12E-01
PB-214	7.56E-01	1.41E-01	5.72E-02
BI-214	6.58E-01	1.30E-01	4.91E-02
PB-210	Not Detected	---	4.14E+01
TH-232	1.01E+00	5.25E-01	1.60E-01
RA-228	9.14E-01	2.95E-01	1.60E-01
AC-228	9.17E-01	3.09E-01	2.79E-01
TH-228	1.21E+00	3.39E-01	5.69E-01
RA-224	8.76E-01	2.71E-01	6.35E-02
PB-212	9.40E-01	3.90E-01	4.71E-02
BI-212	1.03E+00	6.41E-01	3.16E-01
TL-208	8.13E-01	1.71E-01	7.64E-02
U-235	Not Detected	---	2.74E-01
TH-231	Not Detected	---	2.68E+00
PA-231	Not Detected	---	4.50E+00
TH-227	Not Detected	---	4.09E-01
RA-223	Not Detected	---	2.38E-01
RN-219	Not Detected	---	4.74E-01
PB-211	Not Detected	---	1.07E+00
TL-207	Not Detected	---	1.52E+01
AM-241	Not Detected	---	5.45E-01
PU-239	Not Detected	---	5.15E+02
NP-237	Not Detected	---	4.39E-01
PA-233	Not Detected	---	6.99E-02
TH-229	Not Detected	---	2.97E-01

[Summary Report] - Sample ID: : 80185011

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.51E-02
AG-110m	Not Detected	---	1.07E-01
BA-133	Not Detected	---	7.71E-02
BE-7	2.13E-01	1.13E-01	1.50E-01
CD-109	~~2.11E+00~~	~~1.06E+00~~	1.26E+00 Not detected 9/10/08
CD-115	Not Detected	---	1.21E-01
CE-139	Not Detected	---	3.44E-02
CE-141	Not Detected	---	6.33E-02
CE-144	Not Detected	---	2.79E-01
CO-56	Not Detected	---	3.64E-02
CO-57	Not Detected	---	3.47E-02
CO-58	Not Detected	---	3.44E-02
CO-60	Not Detected	---	4.06E-02
CR-51	Not Detected	---	2.90E-01
CS-134	Not Detected	---	5.10E-02
CS-137	1.35E+00	1.94E-01	2.59E-02
EU-152	Not Detected	---	1.04E-01
EU-154	Not Detected	---	2.06E-01
EU-155	Not Detected	---	1.72E-01
FE-59	Not Detected	---	7.71E-02
GD-153	Not Detected	---	1.22E-01
HG-203	Not Detected	---	3.66E-02
I-131	Not Detected	---	4.01E-02
IR-192	Not Detected	---	3.27E-02
K-40	2.04E+01	3.03E+00	2.77E-01
KR-85	Not Detected	---	9.29E+00
MN-52	Not Detected	---	3.96E-02
MN-54	Not Detected	---	3.87E-02
MO-99	Not Detected	---	3.68E-01
NA-22	Not Detected	---	4.81E-02
NA-24	Not Detected	---	1.48E-01
NB-95	Not Detected	---	2.45E-01
ND-147	Not Detected	---	2.56E-01
NI-57	Not Detected	---	6.38E-02
NP-239	Not Detected	---	1.53E-01
RU-103	Not Detected	---	3.66E-02
RU-106	Not Detected	---	3.31E-01
SB-122	Not Detected	---	6.32E-02
SB-124	Not Detected	---	3.19E-02
SB-125	Not Detected	---	1.05E-01
SN-113	Not Detected	---	4.55E-02
TA-182	Not Detected	---	1.67E-01
TA-183	Not Detected	---	5.67E-01
TC-99m	Not Detected	---	1.51E+00
TL-201	Not Detected	---	2.75E-01
XE-133	Not Detected	---	2.48E-01
Y-88	Not Detected	---	2.60E-02
ZN-65	Not Detected	---	1.13E-01
ZR-95	Not Detected	---	6.14E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-09-98 11:13:07 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042635-002
Lab Sample ID : 80185012

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 797.000 gram
Sample Date/Time : 9-08-98 11:26:00 AM
Acquire Start Date/Time : 9-09-98 9:29:55 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.98E-01	4.61E-01	5.77E-01
RA-226	1.55E+00	6.32E-01	5.40E-01
PB-214	6.45E-01	1.29E-01	4.49E-02
BI-214	5.84E-01	1.57E-01	4.27E-02
PB-210	Not Detected	---	3.31E+01
TH-232	8.52E-01	4.04E-01	1.40E-01
RA-228	8.73E-01	2.46E-01	1.53E-01
AC-228	7.89E-01	2.24E-01	2.28E-01
TH-228	5.49E-01	2.13E-01	5.11E-01
RA-224	8.20E-01	2.55E-01	6.48E-02
PB-212	7.98E-01	2.30E-01	3.78E-02
BI-212	9.45E-01	4.20E-01	2.83E-01
TL-208	6.94E-01	1.07E-01	5.97E-02
U-235	Not Detected	---	2.30E-01
TH-231	Not Detected	---	2.32E+00
PA-231	Not Detected	---	3.92E+00
TH-227	Not Detected	---	3.43E-01
RA-223	Not Detected	---	2.17E-01
RN-219	Not Detected	---	3.86E-01
PB-211	Not Detected	---	8.81E-01
TL-207	Not Detected	---	1.29E+01
AM-241	Not Detected	---	4.82E-01
PU-239	Not Detected	---	4.48E+02
NP-237	Not Detected	---	2.97E-01
PA-233	Not Detected	---	6.09E-02
TH-229	Not Detected	---	2.50E-01

[Summary Report] - Sample ID: : 80185012

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.83E-02
AG-110m	Not Detected	---	8.41E-02
BA-133	Not Detected	---	6.34E-02
BE-7	Not Detected	---	2.88E-01
CD-109	Not Detected	---	1.01E+00
CD-115	Not Detected	---	1.04E-01
CE-139	Not Detected	---	2.95E-02
CE-141	Not Detected	---	5.31E-02
CE-144	Not Detected	---	2.44E-01
CO-56	Not Detected	---	3.04E-02
CO-57	Not Detected	---	3.03E-02
CO-58	Not Detected	---	2.97E-02
CO-60	Not Detected	---	3.29E-02
CR-51	Not Detected	---	2.45E-01
CS-134	Not Detected	---	4.31E-02
CS-137	9.96E-01	1.45E-01	2.26E-02
EU-152	Not Detected	---	9.12E-02
EU-154	Not Detected	---	1.78E-01
EU-155	Not Detected	---	1.50E-01
FE-59	Not Detected	---	7.04E-02
GD-153	Not Detected	---	1.04E-01
HG-203	Not Detected	---	3.29E-02
I-131	Not Detected	---	3.39E-02
IR-192	Not Detected	---	2.89E-02
K-40	1.91E+01	2.76E+00	2.28E-01
KR-85	Not Detected	---	8.00E+00
MN-52	Not Detected	---	3.37E-02
MN-54	Not Detected	---	3.06E-02
MO-99	Not Detected	---	3.14E-01
NA-22	Not Detected	---	4.11E-02
NA-24	Not Detected	---	1.48E-01
NB-95	Not Detected	---	2.09E-01
ND-147	Not Detected	---	2.14E-01
NI-57	Not Detected	---	4.41E-02
NP-239	Not Detected	---	1.35E-01
RU-103	Not Detected	---	3.18E-02
RU-106	Not Detected	---	2.80E-01
SB-122	Not Detected	---	5.77E-02
SB-124	Not Detected	---	2.81E-02
SB-125	Not Detected	---	8.82E-02
SN-113	Not Detected	---	3.86E-02
TA-182	Not Detected	---	1.45E-01
TA-183	Not Detected	---	5.01E-01
TC-99m	Not Detected	---	1.58E+00
TL-201	Not Detected	---	2.49E-01
XE-133	Not Detected	---	2.27E-01
Y-88	Not Detected	---	2.24E-02
ZN-65	Not Detected	---	9.76E-02
ZR-95	Not Detected	---	5.68E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

9-10-98 2:43:52 AM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042639-002
Lab Sample ID : 80185014

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 776.000 gram
Sample Date/Time : 9-08-98 11:43:00 AM
Acquire Start Date/Time : 9-10-98 1:00:33 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.87E-01
RA-226	1.52E+00	6.55E-01	5.56E-01
PB-214	7.04E-01	1.29E-01	4.70E-02
BI-214	6.56E-01	1.25E-01	4.18E-02
PB-210	Not Detected	---	3.55E+01
TH-232	8.96E-01	6.22E-01	1.47E-01
RA-228	8.95E-01	2.17E-01	1.42E-01
AC-228	9.24E-01	7.70E-01	2.37E-01
TH-228	9.50E-01	2.80E-01	4.86E-01
RA-224	9.04E-01	2.61E-01	6.48E-02
PB-212	8.53E-01	7.86E-01	3.90E-02
BI-212	1.04E+00	3.88E-01	2.92E-01
TL-208	7.75E-01	1.97E-01	7.08E-02
U-235	Not Detected	---	2.40E-01
TH-231	Not Detected	---	2.41E+00
PA-231	Not Detected	---	4.00E+00
TH-227	Not Detected	---	3.58E-01
RA-223	Not Detected	---	2.18E-01
RN-219	Not Detected	---	4.08E-01
PB-211	Not Detected	---	9.12E-01
TL-207	Not Detected	---	1.31E+01
AM-241	Not Detected	---	4.87E-01
PU-239	Not Detected	---	4.63E+02
NP-237	Not Detected	---	3.38E-01
PA-233	Not Detected	---	6.20E-02
TH-229	Not Detected	---	2.59E-01

[Summary Report] - Sample ID: : 80185014

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.03E-02
AG-110m	Not Detected	---	8.51E-02
BA-133	Not Detected	---	6.71E-02
BE-7	1.15E-01	9.87E-02	1.40E-01
CD-109	Not Detected	---	1.15E+00
CD-115	Not Detected	---	1.11E-01
CE-139	Not Detected	---	3.02E-02
CE-141	Not Detected	---	5.52E-02
CE-144	Not Detected	---	2.55E-01
CO-56	Not Detected	---	3.32E-02
CO-57	Not Detected	---	3.13E-02
CO-58	Not Detected	---	3.12E-02
CO-60	Not Detected	---	3.59E-02
CR-51	Not Detected	---	2.55E-01
CS-134	Not Detected	---	4.52E-02
CS-137	9.94E-01	1.45E-01	2.21E-02
EU-152	Not Detected	---	9.41E-02
EU-154	Not Detected	---	1.86E-01
EU-155	Not Detected	---	1.54E-01
FE-59	Not Detected	---	6.99E-02
GD-153	Not Detected	---	1.11E-01
HG-203	Not Detected	---	3.27E-02
I-131	Not Detected	---	3.44E-02
IR-192	Not Detected	---	2.95E-02
K-40	1.94E+01	2.83E+00	2.41E-01
KR-85	Not Detected	---	8.38E+00
MN-52	Not Detected	---	3.70E-02
MN-54	Not Detected	---	1.52E-02
MO-99	Not Detected	---	3.36E-01
NA-22	Not Detected	---	4.21E-02
NA-24	Not Detected	---	1.73E-01
NB-95	Not Detected	---	2.23E-01
ND-147	Not Detected	---	2.22E-01
NI-57	Not Detected	---	4.69E-02
NP-239	Not Detected	---	1.39E-01
RU-103	Not Detected	---	3.17E-02
RU-106	Not Detected	---	2.81E-01
SB-122	Not Detected	---	5.74E-02
SB-124	Not Detected	---	2.93E-02
SB-125	Not Detected	---	8.90E-02
SN-113	Not Detected	---	4.02E-02
TA-182	Not Detected	---	1.47E-01
TA-183	Not Detected	---	5.11E-01
TC-99m	Not Detected	---	2.41E+00
TL-201	Not Detected	---	2.68E-01
XE-133	Not Detected	---	2.35E-01
Y-88	Not Detected	---	2.31E-02
ZN-65	Not Detected	---	1.01E-01
ZR-95	Not Detected	---	5.62E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 6:08:29 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042636-002
Lab Sample ID : 80185015

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 816.000 gram
Sample Date/Time : 9-08-98 11:34:00 AM
Acquire Start Date/Time : 9-10-98 2:46:10 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.09E-01	4.05E-01	6.14E-01
RA-226	1.55E+00	7.15E-01	5.67E-01
PB-214	7.12E-01	1.33E-01	4.34E-02
BI-214	5.61E-01	1.08E-01	4.15E-02
PB-210	Not Detected	---	3.28E+01
TH-232	8.81E-01	4.40E-01	1.33E-01
RA-228	9.01E-01	2.66E-01	1.47E-01
AC-228	8.51E-01	2.50E-01	2.27E-01
TH-228	8.61E-01	2.50E-01	4.57E-01
RA-224	8.63E-01	2.69E-01	5.53E-02
PB-212	8.65E-01	1.39E-01	3.64E-02
BI-212	1.12E+00	4.70E-01	2.89E-01
TL-208	8.12E-01	1.51E-01	5.63E-02
U-235	Not Detected	---	2.20E-01
TH-231	Not Detected	---	2.17E+00
PA-231	Not Detected	---	3.75E+00
TH-227	Not Detected	---	3.39E-01
RA-223	Not Detected	---	2.12E-01
RN-219	Not Detected	---	3.60E-01
PB-211	Not Detected	---	8.16E-01
TL-207	Not Detected	---	1.27E+01
AM-241	Not Detected	---	4.55E-01
PU-239	Not Detected	---	4.31E+02
NP-237	Not Detected	---	3.10E-01
PA-233	Not Detected	---	5.53E-02
TH-229	Not Detected	---	2.43E-01

[Summary Report] - Sample ID: : 80185015

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.74E-02
AG-110m	Not Detected	---	4.90E-02
BA-133	Not Detected	---	6.36E-02
BE-7	Not Detected	---	2.55E-01
CD-109	~~1.88E+00~~	~~7.03E-01~~	1.05E+00
CD-115	Not Detected	---	1.08E-01
CE-139	Not Detected	---	2.82E-02
CE-141	Not Detected	---	5.06E-02
CE-144	Not Detected	---	2.33E-01
CO-56	Not Detected	---	3.10E-02
CO-57	Not Detected	---	2.96E-02
CO-58	Not Detected	---	2.97E-02
CO-60	Not Detected	---	3.19E-02
CR-51	Not Detected	---	2.19E-01
CS-134	Not Detected	---	4.18E-02
CS-137	2.57E-01	9.60E-02	2.05E-02
EU-152	Not Detected	---	8.90E-02
EU-154	Not Detected	---	1.72E-01
EU-155	Not Detected	---	1.42E-01
FE-59	Not Detected	---	6.71E-02
GD-153	Not Detected	---	1.04E-01
HG-203	Not Detected	---	3.08E-02
I-131	Not Detected	---	3.22E-02
IR-192	Not Detected	---	2.58E-02
K-40	1.93E+01	2.78E+00	2.24E-01
KR-85	Not Detected	---	7.92E+00
MN-52	Not Detected	---	3.30E-02
MN-54	Not Detected	---	3.27E-02
MO-99	Not Detected	---	3.35E-01
NA-22	Not Detected	---	4.05E-02
NA-24	Not Detected	---	1.87E-01
NB-95	Not Detected	---	2.15E-01
ND-147	Not Detected	---	2.08E-01
NI-57	Not Detected	---	9.28E-02
NP-239	Not Detected	---	1.29E-01
RU-103	Not Detected	---	2.75E-02
RU-106	Not Detected	---	2.65E-01
SB-122	Not Detected	---	3.09E-02
SB-124	Not Detected	---	2.69E-02
SB-125	Not Detected	---	7.92E-02
SN-113	Not Detected	---	3.58E-02
TA-182	Not Detected	---	1.37E-01
TA-183	Not Detected	---	4.86E-01
TC-99m	Not Detected	---	2.76E+00
TL-201	Not Detected	---	2.56E-01
XE-133	Not Detected	---	2.39E-01
Y-88	Not Detected	---	2.28E-02
ZN-65	Not Detected	---	9.32E-02
ZR-95	Not Detected	---	5.47E-02

Not detected
5/10/88

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 6:14:09 AM

* Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042637-002
Lab Sample ID : 80185016

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 682.000 gram
Sample Date/Time : 9-08-98 11:37:00 AM
Acquire Start Date/Time : 9-10-98 4:31:19 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	7.55E-01	5.08E-01	7.47E-01
RA-226	1.84E+00	9.87E-01	6.93E-01
PB-214	7.45E-01	1.41E-01	6.30E-02
BI-214	6.16E-01	1.36E-01	4.93E-02
PB-210	Not Detected	---	4.30E+01
TH-232	1.07E+00	5.63E-01	2.07E-01
RA-228	8.32E-01	2.20E-01	1.57E-01
AC-228	7.84E-01	9.28E-01	2.70E-01
TH-228	8.57E-01	3.09E-01	6.19E-01
RA-224	8.80E-01	2.97E-01	6.42E-02
PB-212	8.37E-01	2.21E-01	4.70E-02
BI-212	1.03E+00	4.26E-01	3.07E-01
TL-208	8.32E-01	1.21E-01	7.34E-02
U-235	Not Detected	---	2.80E-01
TH-231	Not Detected	---	2.88E+00
PA-231	Not Detected	---	4.82E+00
TH-227	Not Detected	---	3.97E-01
RA-223	Not Detected	---	2.63E-01
RN-219	Not Detected	---	5.21E-01
PB-211	Not Detected	---	1.18E+00
TL-207	Not Detected	---	1.43E+01
AM-241	Not Detected	---	5.68E-01
PU-239	Not Detected	---	5.21E+02
NP-237	Not Detected	---	3.94E-01
PA-233	Not Detected	---	7.48E-02
TH-229	Not Detected	---	3.03E-01

[Summary Report] - Sample ID: : 80185016

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.27E-02
AG-110m	Not Detected	---	1.50E-01
BA-133	Not Detected	---	7.78E-02
BE-7	Not Detected	---	3.92E-01
CD-109	~~1.56E+00~~	~~7.60E-01~~	1.34E+00
CD-115	Not Detected	---	1.42E-01
CE-139	Not Detected	---	3.64E-02
CE-141	Not Detected	---	6.53E-02
CE-144	Not Detected	---	2.86E-01
CO-56	Not Detected	---	3.46E-02
CO-57	Not Detected	---	3.69E-02
CO-58	Not Detected	---	3.44E-02
CO-60	Not Detected	---	3.78E-02
CR-51	Not Detected	---	3.13E-01
CS-134	Not Detected	---	4.99E-02
CS-137	2.96E+00	4.05E-01	2.67E-02
EU-152	Not Detected	---	1.11E-01
EU-154	Not Detected	---	1.97E-01
EU-155	Not Detected	---	1.76E-01
FE-59	Not Detected	---	8.22E-02
GD-153	Not Detected	---	1.28E-01
HG-203	Not Detected	---	3.99E-02
I-131	Not Detected	---	4.43E-02
IR-192	Not Detected	---	3.57E-02
K-40	2.22E+01	3.21E+00	2.72E-01
KR-85	Not Detected	---	1.01E+01
MN-52	Not Detected	---	3.51E-02
MN-54	Not Detected	---	3.68E-02
MO-99	Not Detected	---	3.92E-01
NA-22	Not Detected	---	4.62E-02
NA-24	Not Detected	---	2.34E-01
NB-95	Not Detected	---	2.55E-01
ND-147	Not Detected	---	2.85E-01
NI-57	Not Detected	---	5.89E-02
NP-239	Not Detected	---	1.59E-01
RU-103	Not Detected	---	4.10E-02
RU-106	Not Detected	---	3.35E-01
SB-122	Not Detected	---	7.16E-02
SB-124	Not Detected	---	3.41E-02
SB-125	Not Detected	---	1.21E-01
SN-113	Not Detected	---	5.06E-02
TA-182	Not Detected	---	1.66E-01
TA-183	Not Detected	---	6.09E-01
TC-99m	Not Detected	---	4.24E+00
TL-201	Not Detected	---	3.17E-01
XE-133	Not Detected	---	2.96E-01
Y-88	Not Detected	---	2.91E-02
ZN-65	Not Detected	---	1.15E-01
ZR-95	Not Detected	---	6.30E-02

Not detected
9/10/98

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 6:28:17 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042626-002
Lab Sample ID : 80185017

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 719.000 gram
Sample Date/Time : 9-08-98 10:32:00 AM
Acquire Start Date/Time : 9-10-98 9:28:01 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.30E-01	4.20E-01	6.07E-01
RA-226	1.42E+00	6.18E-01	5.38E-01
PB-214	6.43E-01	5.16E-01	4.37E-02
BI-214	5.55E-01	1.16E-01	4.46E-02
PB-210	Not Detected	---	3.73E+01
TH-232	8.35E-01	3.98E-01	1.53E-01
RA-228	8.93E-01	2.37E-01	1.42E-01
AC-228	8.75E-01	2.42E-01	2.54E-01
TH-228	7.67E-01	2.58E-01	5.18E-01
RA-224	9.55E-01	2.66E-01	7.14E-02
PB-212	8.07E-01	1.34E-01	3.92E-02
BI-212	9.51E-01	4.63E-01	2.88E-01
TL-208	7.62E-01	1.50E-01	6.51E-02
U-235	Not Detected	---	2.37E-01
TH-231	Not Detected	---	2.37E+00
PA-231	Not Detected	---	3.99E+00
TH-227	Not Detected	---	3.60E-01
RA-223	Not Detected	---	2.31E-01
RN-219	Not Detected	---	3.91E-01
PB-211	Not Detected	---	8.73E-01
TL-207	Not Detected	---	1.31E+01
AM-241	Not Detected	---	4.92E-01
PU-239	Not Detected	---	4.51E+02
NP-237	Not Detected	---	3.36E-01
PA-233	Not Detected	---	6.07E-02
TH-229	Not Detected	---	2.50E-01

[Summary Report] - Sample ID: : 80185017

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.18E-02
AG-110m	Not Detected	---	6.38E-02
BA-133	Not Detected	---	6.56E-02
BE-7	1.39E-01	1.14E-01	1.54E-01
CD-109	~~1.43E+00~~	~~6.94E-01~~	1.14E+00
CD-115	Not Detected	---	1.25E-01
CE-139	Not Detected	---	2.98E-02
CE-141	Not Detected	---	5.45E-02
CE-144	Not Detected	---	2.46E-01
CO-56	Not Detected	---	3.26E-02
CO-57	Not Detected	---	3.07E-02
CO-58	Not Detected	---	3.15E-02
CO-60	Not Detected	---	3.54E-02
CR-51	Not Detected	---	2.54E-01
CS-134	Not Detected	---	4.57E-02
CS-137	4.52E-01	8.30E-02	2.30E-02
EU-152	Not Detected	---	9.23E-02
EU-154	Not Detected	---	1.93E-01
EU-155	Not Detected	---	1.51E-01
FE-59	Not Detected	---	7.26E-02
GD-153	Not Detected	---	1.05E-01
HG-203	Not Detected	---	3.34E-02
I-131	Not Detected	---	3.44E-02
IR-192	Not Detected	---	2.89E-02
K-40	1.83E+01	3.02E+00	2.68E-01
KR-85	Not Detected	---	8.57E+00
MN-52	Not Detected	---	3.70E-02
MN-54	Not Detected	---	3.40E-02
MO-99	Not Detected	---	3.69E-01
NA-22	Not Detected	---	4.38E-02
NA-24	Not Detected	---	2.67E-01
NB-95	Not Detected	---	2.42E-01
ND-147	Not Detected	---	2.34E-01
NI-57	~~1.14E-01~~	~~4.91E-02~~	6.08E-02
NP-239	Not Detected	---	1.35E-01
RU-103	Not Detected	---	3.18E-02
RU-106	Not Detected	---	2.76E-01
SB-122	Not Detected	---	6.65E-02
SB-124	Not Detected	---	2.90E-02
SB-125	Not Detected	---	8.74E-02
SN-113	Not Detected	---	3.91E-02
TA-182	Not Detected	---	1.50E-01
TA-183	Not Detected	---	5.56E-01
TC-99m	Not Detected	---	7.12E+00
TL-201	Not Detected	---	2.84E-01
XE-133	Not Detected	---	2.73E-01
Y-88	Not Detected	---	2.59E-02
ZN-65	Not Detected	---	1.02E-01
ZR-95	Not Detected	---	5.75E-02

Not detected 9/10/98

Not detected 9/10/98

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 6:55:12 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042631-002
Lab Sample ID : 80185018

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 833.000 gram
Sample Date/Time : 9-08-98 11:14:00 AM
Acquire Start Date/Time : 9-10-98 11:15:45 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	7.04E-01	4.83E-01	5.93E-01
RA-226	1.15E+00	5.82E-01	5.01E-01
PB-214	5.13E-01	9.82E-02	3.93E-02
BI-214	4.54E-01	9.06E-02	3.96E-02
PB-210	Not Detected	---	3.09E+01
TH-232	6.84E-01	3.73E-01	1.25E-01
RA-228	5.95E-01	3.39E-01	1.33E-01
AC-228	6.25E-01	2.09E-01	2.21E-01
TH-228	5.26E-01	2.13E-01	4.08E-01
RA-224	7.43E-01	2.41E-01	5.24E-02
PB-212	6.35E-01	2.47E-01	3.53E-02
BI-212	7.82E-01	4.18E-01	2.86E-01
TL-208	5.48E-01	3.68E-01	5.22E-02
U-235	Not Detected	---	2.11E-01
TH-231	Not Detected	---	2.06E+00
PA-231	Not Detected	---	3.48E+00
TH-227	Not Detected	---	2.99E-01
RA-223	Not Detected	---	1.95E-01
RN-219	Not Detected	---	3.26E-01
PB-211	Not Detected	---	7.48E-01
TL-207	Not Detected	---	1.17E+01
AM-241	Not Detected	---	4.28E-01
PU-239	Not Detected	---	3.99E+02
NP-237	Not Detected	---	3.47E-01
PA-233	Not Detected	---	5.27E-02
TH-229	Not Detected	---	2.22E-01

[Summary Report] - Sample ID: : 80185018

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.51E-02
AG-110m	Not Detected	---	5.16E-02
BA-133	Not Detected	---	5.52E-02
BE-7	1.07E+00	3.29E-01	1.58E-01
CD-109	~~1.70E+00~~	~~8.80E-01~~	1.01E+00
CD-115	Not Detected	---	1.09E-01
CE-139	Not Detected	---	2.66E-02
CE-141	Not Detected	---	4.96E-02
CE-144	Not Detected	---	2.18E-01
CO-56	Not Detected	---	3.06E-02
CO-57	Not Detected	---	2.69E-02
CO-58	Not Detected	---	2.95E-02
CO-60	Not Detected	---	3.40E-02
CR-51	Not Detected	---	2.15E-01
CS-134	Not Detected	---	3.80E-02
CS-137	3.26E-01	8.74E-02	2.12E-02
EU-152	Not Detected	---	8.08E-02
EU-154	Not Detected	---	1.63E-01
EU-155	Not Detected	---	1.35E-01
FE-59	Not Detected	---	6.98E-02
GD-153	Not Detected	---	9.55E-02
HG-203	Not Detected	---	2.90E-02
I-131	Not Detected	---	3.03E-02
IR-192	Not Detected	---	2.50E-02
K-40	2.11E+01	3.03E+00	2.00E-01
KR-85	Not Detected	---	7.24E+00
MN-52	Not Detected	---	3.04E-02
MN-54	Not Detected	---	3.07E-02
MO-99	Not Detected	---	3.37E-01
NA-22	Not Detected	---	4.03E-02
NA-24	Not Detected	---	2.72E-01
NB-95	Not Detected	---	2.03E-01
ND-147	Not Detected	---	2.03E-01
NI-57	Not Detected	---	4.43E-02
NP-239	Not Detected	---	1.22E-01
RU-103	Not Detected	---	2.71E-02
RU-106	Not Detected	---	2.48E-01
SB-122	Not Detected	---	6.01E-02
SB-124	Not Detected	---	2.49E-02
SB-125	Not Detected	---	7.40E-02
SN-113	Not Detected	---	3.34E-02
TA-182	Not Detected	---	1.29E-01
TA-183	Not Detected	---	4.82E-01
TC-99m	Not Detected	---	7.07E+00
TL-201	Not Detected	---	2.52E-01
XE-133	Not Detected	---	2.40E-01
Y-88	Not Detected	---	2.11E-02
ZN-65	Not Detected	---	8.85E-02
ZR-95	Not Detected	---	4.74E-02

not detected
9/10/98

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 1:14:15 PM

Analyzed by: 9/10/98 Reviewed by: 9/11/98

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 80185019

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 9-10-98 1:02:04 PM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	4.55E+03
RA-226	Not Detected	---	6.23E+03
PB-214	Not Detected	---	7.01E+02
BI-214	Not Detected	---	6.28E+02
PB-210	Not Detected	---	2.65E+05
TH-232	Not Detected	---	2.23E+03
RA-228	Not Detected	---	2.49E+03
AC-228	Not Detected	---	1.49E+03
TH-228	Not Detected	---	1.19E+05
RA-224	Not Detected	---	3.97E+03
PB-212	Not Detected	---	8.76E+03
BI-212	Not Detected	---	7.23E+04
TL-208	Not Detected	---	1.63E+04
U-235	Not Detected	---	1.73E+03
TH-231	Not Detected	---	2.09E+04
PA-231	Not Detected	---	3.57E+04
TH-227	Not Detected	---	2.55E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.81E+03
PB-211	Not Detected	---	1.32E+04
TL-207	Not Detected	---	2.14E+05
AM-241	7.91E+04	1.42E+04	3.18E+03
PU-239	Not Detected	---	3.17E+06
NP-237	Not Detected	---	2.37E+03
PA-233	Not Detected	---	6.22E+02
TH-229	Not Detected	---	1.71E+03

[Summary Report] - Sample ID: : 80185019

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.20E+02
AG-110m	Not Detected	---------	4.78E+06
BA-133	Not Detected	---------	7.24E+02
BE-7	Not Detected	---------	5.66E+19
CD-109	2.78E+05	2.62E+05	4.06E+05
CD-115	Not Detected	---------	1.00E+26
CE-139	Not Detected	---------	4.32E+08
CE-141	Not Detected	---------	1.00E+26
CE-144	Not Detected	---------	1.94E+06
CO-56	Not Detected	---------	5.68E+13
CO-57	Not Detected	---------	3.40E+05
CO-58	Not Detected	---------	5.19E+14
CO-60	8.18E+04	1.11E+04	4.42E+02
CR-51	Not Detected	---------	1.00E+26
CS-134	Not Detected	---------	4.04E+03
CS-137	7.16E+04	9.53E+03	2.61E+02
EU-152	Not Detected	---------	1.02E+03
EU-154	Not Detected	---------	2.65E+03
EU-155	Not Detected	---------	3.39E+03
FE-59	Not Detected	---------	2.03E+22
GD-153	Not Detected	---------	2.69E+06
HG-203	Not Detected	---------	1.03E+21
I-131	Not Detected	---------	1.00E+26
IR-192	Not Detected	---------	1.44E+14
K-40	Not Detected	---------	1.34E+03
KR-85	Not Detected	---------	1.20E+05
MN-52	Not Detected	---------	1.00E+26
MN-54	Not Detected	---------	2.00E+05
MO-99	Not Detected	---------	1.00E+26
NA-22	Not Detected	---------	1.69E+03
NA-24	Not Detected	---------	1.00E+26
NB-95	Not Detected	---------	1.00E+26
ND-147	Not Detected	---------	1.00E+26
NI-57	Not Detected	---------	1.00E+26
NP-239	Not Detected	---------	9.45E+02
RU-103	Not Detected	---------	1.00E+26
RU-106	Not Detected	---------	6.59E+05
SB-122	Not Detected	---------	1.00E+26
SB-124	Not Detected	---------	6.37E+16
SB-125	Not Detected	---------	8.10E+03
SN-113	Not Detected	---------	1.43E+10
TA-182	Not Detected	---------	3.72E+10
TA-183	Not Detected	---------	1.00E+26
TC-99m	Not Detected	---------	1.00E+26
TL-201	Not Detected	---------	1.00E+26
XE-133	Not Detected	---------	1.00E+26
Y-88	Not Detected	---------	1.84E+10
ZN-65	Not Detected	---------	2.95E+06
ZR-95	Not Detected	---------	1.71E+16

****
*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program
* Quality Assurance Report
*
****

Report Date : 9-10-98 1:14:56 PM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 80185019
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 9-10-98 1:02:04 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
AM-241 Activity	8.235E-02	4.285E-03	7.914E-02	<	:	:	: >
CS-137 Activity	7.039E-02	2.043E-03	7.164E-02	<	:	:	: >
CO-60 Activity	7.831E-02	2.217E-03	8.163E-02	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 9/10/98

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9-10-98 12:58:21 AM
*
* Analyzed by: 9/10/98 Reviewed by: 9/11/98
****

Customer : C.BYRD/R.PARKER (6134/SMO)
Customer Sample ID : 042638-002
Lab Sample ID : 80185013

Sample Description : SOIL MARINELLI SAMPLE
Sample Quantity : 489.000 gram
Sample Date/Time : 9-08-98 11:40:00 AM
Acquire Start Date/Time : 9-09-98 11:15:19 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.04E+00
RA-226	1.14E+00	9.96E-01	7.67E-01
PB-214	6.84E-01	9.18E-01	6.69E-02
BI-214	6.45E-01	1.55E-01	5.67E-02
PB-210	Not Detected	---	4.84E+01
TH-232	8.97E-01	4.39E-01	1.87E-01
RA-228	8.62E-01	2.91E-01	1.78E-01
AC-228	9.31E-01	3.42E-01	3.68E-01
TH-228	1.00E+00	3.42E-01	6.75E-01
RA-224	8.50E-01	2.86E-01	8.84E-02
PB-212	9.07E-01	2.38E-01	5.41E-02
BI-212	9.01E-01	4.87E-01	3.82E-01
TL-208	7.70E-01	1.97E-01	9.19E-02
U-235	Not Detected	---	3.08E-01
TH-231	Not Detected	---	3.19E+00
PA-231	Not Detected	---	5.33E+00
TH-227	Not Detected	---	4.71E-01
RA-223	Not Detected	---	2.89E-01
RN-219	Not Detected	---	5.79E-01
PB-211	Not Detected	---	1.32E+00
TL-207	Not Detected	---	1.65E+01
AM-241	Not Detected	---	6.40E-01
PU-239	Not Detected	---	5.87E+02
NP-237	Not Detected	---	4.09E-01
PA-233	Not Detected	---	8.02E-02
TH-229	Not Detected	---	3.39E-01

[Summary Report] - Sample ID: : 80185013

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	5.31E-02
AG-110m	Not Detected	---	1.53E-01
BA-133	Not Detected	---	8.81E-02
BE-7	Not Detected	---	4.19E-01
CD-109	Not Detected	---	1.39E+00
CD-115	Not Detected	---	1.47E-01
CE-139	Not Detected	---	4.09E-02
CE-141	Not Detected	---	7.11E-02
CE-144	Not Detected	---	3.30E-01
CO-56	Not Detected	---	4.40E-02
CO-57	Not Detected	---	4.08E-02
CO-58	Not Detected	---	4.00E-02
CO-60	Not Detected	---	4.18E-02
CR-51	Not Detected	---	3.47E-01
CS-134	Not Detected	---	5.94E-02
CS-137	2.17E+00	3.08E-01	3.08E-02
EU-152	Not Detected	---	1.23E-01
EU-154	Not Detected	---	2.44E-01
EU-155	Not Detected	---	2.01E-01
FE-59	Not Detected	---	9.22E-02
GD-153	Not Detected	---	1.41E-01
HG-203	Not Detected	---	4.55E-02
I-131	Not Detected	---	4.84E-02
IR-192	Not Detected	---	3.95E-02
K-40	1.75E+01	2.69E+00	3.71E-01
KR-85	Not Detected	---	1.17E+01
MN-52	Not Detected	---	4.20E-02
MN-54	Not Detected	---	2.14E-02
MO-99	Not Detected	---	4.45E-01
NA-22	Not Detected	---	5.31E-02
NA-24	Not Detected	---	2.13E-01
NB-95	Not Detected	---	2.90E-01
ND-147	Not Detected	---	3.19E-01
NI-57	Not Detected	---	6.39E-02
NP-239	Not Detected	---	1.80E-01
RU-103	Not Detected	---	4.47E-02
RU-106	Not Detected	---	3.73E-01
SB-122	Not Detected	---	8.02E-02
SB-124	Not Detected	---	3.91E-02
SB-125	Not Detected	---	1.35E-01
SN-113	Not Detected	---	5.70E-02
TA-182	Not Detected	---	1.81E-01
TA-183	Not Detected	---	6.78E-01
TC-99m	Not Detected	---	2.58E+00
TL-201	Not Detected	---	3.36E-01
XE-133	Not Detected	---	3.08E-01
Y-88	Not Detected	---	3.66E-02
ZN-65	Not Detected	---	1.24E-01
ZR-95	Not Detected	---	6.97E-02

Feature 58S

ANALYSIS REQUEST AND CHAIN OF CUSTODY

RUSH

PAGE 1 OF 1

AR/COC- 06199

SF 2001-COC (6-95)

Internal Lab Batch No. 701823

Dept. No./Mail Stop: 6134 to 585 (ED) / MS 1148
Project/Task Manager: Caroline Byrd
Project Name: SWMU RFI Assess. Sampling
Record Center Code: ER/1332/585/DAT
Logbook Ref No: 006
Service Order No.: CF0500

Date Samples Shipped: 10-17-97
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: RPSD Bldg. 881
SMO Contact/Phone: Doug Salmi
Send Report to SMO Angela Chavez

Contract No.: NA
Case No.: 72130000
SMO Authorization: Bill to DM
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested: Gamma Spec

Location — Tech Area NA — Building NA — Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
036211-002	1332-585-001-0.5-SS	0.5	58	10/16/97 0950	S	P	500ml	None	G	SA	X	
036215-002	1332-585-005-0.5-SS			1005								
036220-002	1332-585-010-0.5-SS			1032								
036225-002	1332-585-015-0.5-SS			1352								

RUSH

RMMA ☐ Yes ☒ No Ref. No. ____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush Required Report Date ____

Sample Tracking (SMO USE) Date Entered (mm/dd/yy): ____ Entered by: ____ QC Inits: ____

Special Instructions/QC Requirements
* COC #6199 releases COC #6296 to GEL.
* Send as separate report to Ed Mignardot

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Karen DeWees	Karen DeWees	KD	MDM/6131/284-3309

1. Relinquished by	Karen DeWees	Org. 6134/MDM	Date 10/17/97	Time 1000	4. Relinquished by	Org.	Date	Time
1. Received by		Org. 7578/SWO	Date 10/17/97	Time 1000	4. Received by	Org.	Date	Time
2. Relinquished by		Org. 7578/SWO	Date 10/17/97	Time 1045	5. Relinquished by	Org.	Date	Time
2. Received by		Org. SNL7578	Date 10/17/97	Time 1045	5. Received by	Org.	Date	Time
3. Relinquished by		Org. SNL7578	Date 10/20/97	Time 1215	6. Relinquished by	Org.	Date	Time
3. Received by		Org. SNL7578	Date 10/20/97	Time 1215	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

"RUSH"

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134 / MS 1148
Project Location: Site 58s
Phone: 284-2531
Date Results Needed: 10/20/97
Suspect Isotopes: Unk
Case Number: 7213130000

Hazards/Special Instructions:
* Rush
* Not a RMMA

cxc 6/99 RUSH

Batch Log Number: 701823
Logged By: [signature]

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass	Remarks / Aliquot Amount
036211-002	S	10/16/97 0950	1	Gamma Spec	01	2300	N/A	735 g
036215-002	↓	1005	1	↓	02	↓	↓	669 g
036220-002	↓	1032	1	↓	03	↓	↓	727 g
036225-002	↓	1352	1	↓	04	2300	↓	642 g
LCS	—	1NOV90	—	Y Spec	05	N/A	N/A	
				RUSH				

Relinquished by [signature] Date 10/17/97 Received by [signature] Date 10/17/97
Relinquished by [signature] Date 10/20/97 Received by [signature] Date 10/20/97
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____

RPSD-0602-02.3

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-17-97 12:47:01 PM *
****
*
* Analyzed by: 10/18/97 Reviewed by: 10/20/97 *
****

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036211-002
Lab Sample ID : 70182301

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 733.000 gram
Sample Date/Time : 10-16-97 9:50:00 AM
Acquire Start Date/Time : 10-17-97 11:03:24 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.49E+00
TH-234	1.05E+00	3.87E-01	5.86E-01
RA-226	2.03E+00	8.76E-01	6.73E-01
PB-214	6.88E-01	1.28E-01	4.47E-02
BI-214	6.60E-01	1.22E-01	4.53E-02
PB-210	Not Detected	---	3.65E+01
TH-232	8.68E-01	4.43E-01	1.46E-01
RA-228	8.86E-01	2.14E-01	1.46E-01
AC-228	8.76E-01	7.32E-01	8.31E-02
TH-228	6.62E-01	2.33E-01	4.72E-01
RA-224	8.70E-01	2.52E-01	7.57E-02
PB-212	8.39E-01	3.16E-01	4.12E-02
BI-212	1.07E+00	4.76E-01	3.17E-01
TL-208	8.92E-01	6.37E-01	6.57E-02
U-235	Not Detected	---	2.44E-01
TH-231	Not Detected	---	1.31E+01
PA-231	Not Detected	---	1.44E+00
TH-227	Not Detected	---	3.64E-01
RA-223	Not Detected	---	2.16E-01
RN-219	~~1.89E-01~~	~~3.17E-01~~	3.80E-01 not detected 10/18/97
PB-211	Not Detected	---	8.63E-01
TL-207	Not Detected	---	1.36E+01
AM-241	Not Detected	---	5.02E-01
PU-239	Not Detected	---	4.64E+02
NP-237	Not Detected	---	4.05E-01
PA-233	Not Detected	---	5.83E-02
TH-229	Not Detected	---	2.52E-01

[Summary Report] - Sample ID: : 70182301

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.16E-02
AG-110m	Not Detected	---	4.04E-02
BA-133	Not Detected	---	6.75E-02
BE-7	Not Detected	---	2.60E-01
CD-109	~~1.62E+00~~	~~5.86E-01~~	1.02E+00 not detected
CD-115	Not Detected	---	9.62E-02
CE-139	Not Detected	---	3.05E-02
CE-141	Not Detected	---	5.36E-02
CE-144	Not Detected	---	2.47E-01
CO-56	Not Detected	---	2.77E-02
CO-57	Not Detected	---	3.08E-02
CO-58	Not Detected	---	3.09E-02
CO-60	Not Detected	---	3.47E-02
CR-51	Not Detected	---	2.41E-01
CS-134	Not Detected	---	4.76E-02
CS-137	1.02E-01	2.64E-02	1.89E-02
EU-152	Not Detected	---	9.27E-02
EU-154	Not Detected	---	1.93E-01
EU-155	Not Detected	---	1.54E-01
FE-59	Not Detected	---	7.25E-02
GD-153	Not Detected	---	1.08E-01
HG-203	Not Detected	---	3.24E-02
I-131	Not Detected	---	3.12E-02
IR-192	Not Detected	---	2.76E-02
K-40	1.66E+01	2.44E+00	4.13E-01
MN-52	Not Detected	---	3.03E-02
MN-54	Not Detected	---	3.47E-02
MO-99	Not Detected	---	3.21E-01
NA-22	Not Detected	---	4.16E-02
NA-24	Not Detected	---	1.02E-01
NB-95	Not Detected	---	2.06E-01
ND-147	Not Detected	---	2.23E-01
NI-57	Not Detected	---	7.38E-02
RU-103	Not Detected	---	3.01E-02
RU-106	Not Detected	---	2.97E-01
SB-122	Not Detected	---	5.15E-02
SB-124	Not Detected	---	3.02E-02
SB-125	Not Detected	---	8.19E-02
SN-113	Not Detected	---	3.81E-02
SR-85	Not Detected	---	3.88E-02
TA-182	Not Detected	---	1.51E-01
TA-183	Not Detected	---	4.94E-01
TC-99m	Not Detected	---	6.06E-01
TL-201	Not Detected	---	2.36E-01
XE-133	Not Detected	---	2.05E-01
Y-88	Not Detected	---	2.74E-02
ZN-65	Not Detected	---	1.04E-01
ZR-95	Not Detected	---	5.70E-02

10/16/97

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-17-97 2:32:42 PM *
****
* *
* Analyzed by: 10/18/97 Reviewed by: 10/26/97 *
****

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036215-002
Lab Sample ID : 70182302

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 669.000 gram
Sample Date/Time : 10-16-97 10:05:00 AM
Acquire Start Date/Time : 10-17-97 12:49:20 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.58E+00
TH-234	1.34E+00	4.97E-01	6.47E-01
RA-226	6.15E-01	8.88E-01	5.71E-01
PB-214	6.84E-01	1.33E-01	5.25E-02
BI-214	6.37E-01	5.91E-01	5.26E-02
PB-210	Not Detected	---	3.86E+01
TH-232	8.57E-01	4.58E-01	1.71E-01
RA-228	9.91E-01	2.46E-01	1.64E-01
AC-228	8.51E-01	2.21E-01	8.92E-02
TH-228	9.04E-01	2.96E-01	5.00E-01
RA-224	8.28E-01	2.67E-01	9.07E-02
PB-212	9.02E-01	1.56E-01	4.35E-02
BI-212	1.00E+00	4.02E-01	3.16E-01
TL-208	8.21E-01	1.71E-01	7.36E-02
U-235	6.96E-02	7.68E-02	1.43E-01
TH-231	Not Detected	---	1.36E+01
PA-231	Not Detected	---	1.55E+00
TH-227	Not Detected	---	3.78E-01
RA-223	Not Detected	---	2.25E-01
RN-219	Not Detected	---	4.14E-01
PB-211	Not Detected	---	9.50E-01
TL-207	Not Detected	---	1.50E+01
AM-241	Not Detected	---	5.23E-01
PU-239	Not Detected	---	4.76E+02
NP-237	Not Detected	---	4.21E-01
PA-233	Not Detected	---	6.26E-02
TH-229	Not Detected	---	2.79E-01

[Summary Report] - Sample ID: : 70182302

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.43E-02
AG-110m	Not Detected	---------	4.82E-02
BA-133	Not Detected	---------	7.20E-02
BE-7	Not Detected	---------	2.86E-01
CD-109	2.54E+00	8.39E-01	1.07E+00
CD-115	Not Detected	---------	1.03E-01
CE-139	Not Detected	---------	3.18E-02
CE-141	Not Detected	---------	5.75E-02
CE-144	Not Detected	---------	2.61E-01
CO-56	Not Detected	---------	2.67E-02
CO-57	Not Detected	---------	3.20E-02
CO-58	Not Detected	---------	3.51E-02
CO-60	Not Detected	---------	3.85E-02
CR-51	Not Detected	---------	2.65E-01
CS-134	Not Detected	---------	5.02E-02
CS-137	1.60E-01	5.06E-02	2.70E-02
EU-152	Not Detected	---------	9.62E-02
EU-154	Not Detected	---------	2.04E-01
EU-155	Not Detected	---------	1.61E-01
FE-59	Not Detected	---------	7.67E-02
GD-153	Not Detected	---------	1.16E-01
HG-203	Not Detected	---------	3.39E-02
I-131	Not Detected	---------	3.46E-02
IR-192	Not Detected	---------	3.02E-02
K-40	1.81E+01	2.73E+00	4.55E-01
MN-52	Not Detected	---------	3.72E-02
MN-54	Not Detected	---------	3.76E-02
MO-99	Not Detected	---------	3.34E-01
NA-22	Not Detected	---------	4.58E-02
NA-24	Not Detected	---------	1.17E-01
NB-95	Not Detected	---------	2.17E-01
ND-147	Not Detected	---------	2.28E-01
NI-57	Not Detected	---------	4.20E-02
RU-103	Not Detected	---------	3.32E-02
RU-106	Not Detected	---------	3.25E-01
SB-122	Not Detected	---------	5.88E-02
SB-124	Not Detected	---------	3.30E-02
SB-125	Not Detected	---------	9.00E-02
SN-113	Not Detected	---------	4.10E-02
SR-85	Not Detected	---------	4.11E-02
TA-182	Not Detected	---------	1.57E-01
TA-183	Not Detected	---------	5.18E-01
TC-99m	Not Detected	---------	7.31E-01
TL-201	Not Detected	---------	2.57E-01
XE-133	Not Detected	---------	2.17E-01
Y-88	Not Detected	---------	2.67E-02
ZN-65	Not Detected	---------	1.09E-01
ZR-95	Not Detected	---------	6.10E-02

Not detected
10/18/97

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
10-18-97 2:55:12 PM
*
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Analyzed by: 10/18/97 Reviewed by: 10/20/97

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036220-002
Lab Sample ID : 70182303

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 727.000 gram
Sample Date/Time : 10-16-97 10:32:00 AM
Acquire Start Date/Time : 10-17-97 2:42:06 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.44E+00
TH-234	Not Detected	---	6.00E-01
RA-226	1.67E+00	6.75E-01	5.82E-01
PB-214	6.86E-01	2.20E-01	4.82E-02
BI-214	6.26E-01	3.08E-01	4.85E-02
PB-210	Not Detected	---	3.67E+01
TH-232	8.87E-01	4.29E-01	1.38E-01
RA-228	8.92E-01	2.60E-01	1.53E-01
AC-228	8.35E-01	2.40E-01	8.30E-02
TH-228	7.50E-01	2.42E-01	4.61E-01
RA-224	9.61E-01	3.45E-01	8.25E-02
PB-212	8.52E-01	2.14E-01	4.31E-02
BI-212	8.85E-01	3.85E-01	3.27E-01
TL-208	7.52E-01	4.33E-01	7.37E-02
U-235	Not Detected	---	2.54E-01
TH-231	Not Detected	---	1.29E+01
PA-231	Not Detected	---	1.47E+00
TH-227	Not Detected	---	3.65E-01
RA-223	Not Detected	---	2.16E-01
RN-219	Not Detected	---	3.89E-01
PB-211	Not Detected	---	8.71E-01
TL-207	Not Detected	---	1.38E+01
AM-241	Not Detected	---	4.97E-01
PU-239	Not Detected	---	4.62E+02
NP-237	Not Detected	---	3.96E-01
PA-233	Not Detected	---	5.95E-02
TH-229	Not Detected	---	2.68E-01

[Summary Report] - Sample ID: : 70182303

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.19E-02
AG-110m	Not Detected	---	4.34E-02
BA-133	Not Detected	---	6.75E-02
BE-7	Not Detected	---	2.69E-01
CD-109	~~1.60E+00~~	~~6.02E-01~~	1.00E+00 Not detected 12/18/97
CD-115	Not Detected	---	9.98E-02
CE-139	Not Detected	---	3.00E-02
CE-141	Not Detected	---	5.65E-02
CE-144	Not Detected	---	2.52E-01
CO-56	Not Detected	---	3.74E-02
CO-57	Not Detected	---	3.21E-02
CO-58	Not Detected	---	3.40E-02
CO-60	Not Detected	---	3.70E-02
CR-51	Not Detected	---	2.49E-01
CS-134	Not Detected	---	4.68E-02
CS-137	1.27E-01	4.03E-02	2.15E-02
EU-152	Not Detected	---	9.66E-02
EU-154	Not Detected	---	1.92E-01
EU-155	Not Detected	---	1.04E-01
FE-59	Not Detected	---	7.47E-02
GD-153	Not Detected	---	1.12E-01
HG-203	Not Detected	---	3.21E-02
I-131	Not Detected	---	3.37E-02
IR-192	Not Detected	---	2.80E-02
K-40	1.93E+01	4.07E+00	4.35E-01
MN-52	Not Detected	---	3.45E-02
MN-54	Not Detected	---	3.66E-02
MO-99	Not Detected	---	3.30E-01
NA-22	Not Detected	---	4.29E-02
NA-24	Not Detected	---	1.28E-01
NB-95	Not Detected	---	2.12E-01
ND-147	Not Detected	---	2.23E-01
NI-57	Not Detected	---	4.22E-02
RU-103	Not Detected	---	3.05E-02
RU-106	Not Detected	---	2.97E-01
SB-122	Not Detected	---	5.45E-02
SB-124	Not Detected	---	3.01E-02
SB-125	Not Detected	---	8.54E-02
SN-113	Not Detected	---	3.75E-02
SR-85	Not Detected	---	3.79E-02
TA-182	Not Detected	---	1.54E-01
TA-183	Not Detected	---	5.01E-01
TC-99m	Not Detected	---	8.46E-01
TL-201	Not Detected	---	2.48E-01
XE-133	Not Detected	---	2.16E-01
Y-88	Not Detected	---	2.82E-02
ZN-65	Not Detected	---	1.06E-01
ZR-95	Not Detected	---	5.90E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-18-97 3:30:53 PM *
****

* Analyzed by: 10/18/97 Reviewed by: 10/20/97 *

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036225-002
Lab Sample ID : 70182304

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 642.000 gram
Sample Date/Time : 10-16-97 1:52:00 PM
Acquire Start Date/Time : 10-17-97 4:28:10 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.61E+00
TH-234	1.32E+00	5.12E-01	7.07E-01
RA-226	1.62E+00	5.73E-01	5.54E-01
PB-214	6.83E-01	3.91E-01	5.16E-02
BI-214	5.98E-01	2.78E-01	5.41E-02
PB-210	Not Detected	---	3.77E+01
TH-232	8.63E-01	4.44E-01	1.53E-01
RA-228	9.92E-01	2.79E-01	1.59E-01
AC-228	9.23E-01	2.32E-01	9.08E-02
TH-228	1.02E+00	3.44E-01	5.37E-01
RA-224	9.31E-01	2.90E-01	8.63E-02
PB-212	9.08E-01	5.30E-01	4.72E-02
BI-212	9.44E-01	4.16E-01	3.55E-01
TL-208	8.82E-01	1.94E-01	7.47E-02
U-235	Not Detected	---	2.66E-01
TH-231	Not Detected	---	1.41E+01
PA-231	Not Detected	---	1.53E+00
TH-227	Not Detected	---	3.92E-01
RA-223	Not Detected	---	2.31E-01
RN-219	Not Detected	---	4.25E-01
PB-211	Not Detected	---	9.60E-01
TL-207	Not Detected	---	1.49E+01
AM-241	Not Detected	---	5.26E-01
PU-239	Not Detected	---	4.87E+02
NP-237	6.63E-01	2.12E-01	3.49E-01 Not detected 10/18/97
PA-233	Not Detected	---	6.37E-02
TH-229	Not Detected	---	2.77E-01

[Summary Report] - Sample ID: : 70182304

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.55E-02
AG-110m	Not Detected	---	3.81E-02
BA-133	Not Detected	---	7.15E-02
BE-7	Not Detected	---	2.81E-01
CD-109	Not Detected	---	1.18E+00
CD-115	Not Detected	---	1.03E-01
CE-139	Not Detected	---	3.17E-02
CE-141	Not Detected	---	5.82E-02
CE-144	Not Detected	---	2.63E-01
CO-56	Not Detected	---	3.87E-02
CO-57	Not Detected	---	3.23E-02
CO-58	Not Detected	---	3.46E-02
CO-60	Not Detected	---	3.65E-02
CR-51	Not Detected	---	2.55E-01
CS-134	Not Detected	---	5.03E-02
CS-137	4.12E-02	3.28E-02	2.44E-02
EU-152	Not Detected	---	9.72E-02
EU-154	Not Detected	---	2.10E-01
EU-155	Not Detected	---	1.63E-01
FE-59	Not Detected	---	7.67E-02
GD-153	Not Detected	---	1.15E-01
HG-203	Not Detected	---	3.44E-02
I-131	Not Detected	---	3.36E-02
IR-192	Not Detected	---	3.00E-02
K-40	1.60E+01	2.48E+00	4.93E-01
MN-52	Not Detected	---	3.50E-02
MN-54	Not Detected	---	3.86E-02
MO-99	Not Detected	---	3.48E-01
NA-22	Not Detected	---	4.27E-02
NA-24	Not Detected	---	1.18E-01
NB-95	Not Detected	---	2.24E-01
ND-147	Not Detected	---	2.17E-01
NI-57	Not Detected	---	8.46E-02
RU-103	Not Detected	---	3.18E-02
RU-106	Not Detected	---	3.17E-01
SB-122	Not Detected	---	5.82E-02
SB-124	Not Detected	---	3.38E-02
SB-125	Not Detected	---	9.06E-02
SN-113	Not Detected	---	4.07E-02
SR-85	Not Detected	---	4.17E-02
TA-182	Not Detected	---	1.56E-01
TA-183	Not Detected	---	5.20E-01
TC-99m	Not Detected	---	7.35E-01
TL-201	Not Detected	---	2.59E-01
XE-133	Not Detected	---	2.26E-01
Y-88	Not Detected	---	2.83E-02
ZN-65	Not Detected	---	1.07E-01
ZR-95	Not Detected	---	6.17E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-18-97 8:12:12 AM *
****
*
* Analyzed by: 10/18/97 Reviewed by: 10/20/97 *
****

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 70182305

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 10-18-97 8:00:14 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:
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Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.10E+04
TH-234	Not Detected	---	4.73E+03
RA-226	Not Detected	---	6.33E+03
PB-214	Not Detected	---	7.18E+02
BI-214	Not Detected	---	6.42E+02
PB-210	Not Detected	---	2.63E+05
TH-232	Not Detected	---	2.32E+03
RA-228	Not Detected	---	2.68E+03
AC-228	Not Detected	---	1.59E+03
TH-228	Not Detected	---	8.84E+04
RA-224	Not Detected	---	3.37E+03
PB-212	Not Detected	---	6.46E+03
BI-212	Not Detected	---	5.68E+04
TL-208	Not Detected	---	1.21E+04
U-235	Not Detected	---	1.86E+03
TH-231	Not Detected	---	8.45E+04
PA-231	Not Detected	---	1.48E+04
TH-227	Not Detected	---	2.48E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.84E+03
PB-211	Not Detected	---	1.32E+04
TL-207	Not Detected	---	2.23E+05
AM-241	7.95E+04	1.40E+04	3.19E+03
PU-239	Not Detected	---	3.16E+06
NP-237	Not Detected	---	2.53E+03
PA-233	Not Detected	---	6.30E+02
TH-229	Not Detected	---	1.79E+03

[Summary Report] - Sample ID: : 70182305

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.44E+02
AG-110m	Not Detected	---	1.95E+06
BA-133	Not Detected	---	7.10E+02
BE-7	Not Detected	---	8.23E+17
CD-109	4.87E+05	4.14E+05	3.24E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	8.52E+07
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	8.92E+05
CO-56	Not Detected	---	3.20E+12
CO-57	Not Detected	---	1.52E+05
CO-58	Not Detected	---	2.20E+13
CO-60	7.96E+04	1.08E+04	4.10E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	3.07E+03
CS-137	7.17E+04	9.53E+03	2.67E+02
EU-152	Not Detected	---	9.97E+02
EU-154	Not Detected	---	2.67E+03
EU-155	Not Detected	---	3.00E+03
FE-59	Not Detected	---	1.36E+20
GD-153	Not Detected	---	1.09E+06
HG-203	Not Detected	---	8.13E+18
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	6.85E+12
K-40	Not Detected	---	1.60E+03
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	1.09E+05
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.42E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
RU-103	Not Detected	---	1.15E+22
RU-106	Not Detected	---	3.65E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	1.52E+15
SB-125	Not Detected	---	6.41E+03
SN-113	Not Detected	---	2.08E+09
SR-85	Not Detected	---	2.41E+14
TA-182	Not Detected	---	5.51E+09
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	2.38E+09
ZN-65	Not Detected	---	1.26E+06
ZR-95	Not Detected	---	5.11E+14

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 2

AR/COC- 06200

Internal Lab Batch No. 701824

SF 2001-COC (6-95)

Dept. No./Mail Stop: 1134 (1135) MS 1018
Project/Task Manager: Carolyn Byrd
Project Name: SBS Access. Sampling
Record Center Code: ER/1332/585/DAT
Logbook Ref No: 006
Service Order No.: CF0500

Date Samples Shipped: 10-17-97
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: RFSD Bldg. 881
SMO Contact/Phone: Doug Salmi
Send Report to SMO Angela Chavez

Contract No.: NA
Case No.: 7313130000
SMO Authorization: DS to DM
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Parameter & Method Requested

Comma Sep.

Location Tech Area NA
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type		Lab Sample ID
036212-002	1332-585-002-0.5-SS	0.5	58	10/16/97 0952	S	P	500ml	None	G	SA	X	
036213-002	1332-585-003-0.5-SS			0957								
036214-002	1332-585-004-0.5-SS			0955								
036216-002	1332-585-006-0.5-SS			1007								
036217-002	1332-585-007-0.5-SS			1015								LAB USE
036218-002	1332-585-008-0.5-SS			1017								
036219-002	1332-585-009-0.5-SS			1030								
036221-002	1332-585-011-0.5-SS			1035								
036222-002	1332-585-012-0.5-SS			1037								
036223-002	1332-585-013-0.5-SS			1345								

RMMA ☐ Yes ☒ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking
Date Entered (mm/dd/yy) 10/29/97
Entered by: LA
QC Initials: AMiller

Special Instructions/QC Requirements
*Send as separate report to Ed Mignardot.

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Kyrsten Edwards		KE	MDM 1121 294-3351

1. Relinquished by		Org. 1134 MDM	Date 10/17/97	Time 1100	4. Relinquished by	Org.	Date	Time
1. Received by		Org. 7578/SNL	Date 10/17/97	Time 1000	4. Received by	Org.	Date	Time
2. Relinquished by		Org. 7578/SNL	Date 10/17/97	Time 1045	5. Relinquished by	Org.	Date	Time
2. Received by		Org. SNL7578	Date 10/17/97	Time 1045	5. Received by	Org.	Date	Time
3. Relinquished by	E.B. Ebaa	Org. 7578	Date 10/24/97	Time 1330	6. Relinquished by	Org.	Date	Time
3. Received by		Org. 7578	Date 10/24/97	Time 1330	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

PAGE 2 OF 2

AR/COC- 01200

BATCH # 701824

Project Name: 58S Assess. Sampling Project/Task Manager: Caroline Byrd Case No.: 721313000

Location Tech Area NA Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
036224-002	1332-58S-014-0.5-SS	0.5	58	10/16/97 1347	S	P	500ml	None	G	SA	X	
036226-002	1332-58S-016-0.5-SS			1355								
036227-002	1332-58S-017-0.5-SS			1400								
036228-002	1332-58S-018-0.5-SD			1017								
036229-002	1332-58S-019-FB			1410	FIW					FB		
036230-002	1332-58S-020-FB			1420	FIW					EB		

Parameter & Method Requested

10/29/97

Abnormal Conditions on Receipt

Recipient Initials

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page ____ of ____

To be completed by Customer

Shaded areas are for RPSD use only

Customer : Caroline Byrd
Organization: 6134 / MS 1148
Project Location: Site 58s
Phone: 284-2531
Date Results Needed: Normal 10/24/97
Suspect Isotopes: Unk
Case Number: 721330000

Hazards/Special Instructions:
* Not a RMMA.
C.o.C 06200

Batch Log Number: 701824
Logged By: JM

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass	Remarks / Aliquot Amount
36212-002	SA	10/16/97 0952	1	Gamma Spec	01	<300	641 s	
36213-002		0957			02		722 s	
36214-002		0955			03		69.2 s	
36216-002		1007			04		761 s	
36217-002		1015			05		660 s	
36218-002		1017			06		707 s	
36219-002		1030			07		829 s	
36221-002		1035			08		716 s	
36222-002		1037			09		686 s	
36223-002		1045			10		735 s	
36224-002		1347			11		661 s	
36226-002		1355			12		685 s	
36227-002	SA	1400			13	<300	829 s	

Relinquished by [signature] Date 10/17/97 Received by [signature] Date 10/17/97
Relinquished by S.B. Eberen Date 10/24/97 Received by [signature] Date 10/24/97
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer : Caroline Byrd
Organization: 6134/MS 1148
Project Location: 585
Phone: 845-0868
Date Results Needed: 10/24/97
Suspect Isotopes: UNK
Case Number: 721313 0000

Hazards/Special Instructions:

CoC 06200

Batch Log Number: 701824
Logged By: JM

Analysis Type:
- [X] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass	Remarks / Aliquot Amount
036228-002	DU	10/16/97 1017		Gamma Spec.	14	<300	704 g	
036229-002	FB	1410	1 4x4	↓	15	<300	500 mL	
036230-002	EB	1420	1 4x4	↓	16	<300	500 mL	
LCS	—	1 Nov 97	—	γ spec.	17	N/A	N/A	

Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
10-21-97 4:35:19 PM
*
****

* Analyzed by: 10/21/97 Reviewed by: 10/23/97

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036212-002
Lab Sample ID : 70182401

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 641.000 gram
Sample Date/Time : 10-16-97 9:52:00 AM
Acquire Start Date/Time : 10-18-97 8:41:49 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.72E+00
TH-234	Not Detected	---	6.83E-01
RA-226	1.90E+00	5.19E-01	6.73E-01
PB-214	7.31E-01	1.33E-01	5.18E-02
BI-214	6.50E-01	2.05E-01	5.09E-02
PB-210	Not Detected	---	3.73E+01
TH-232	9.06E-01	4.53E-01	1.48E-01
RA-228	8.84E-01	2.84E-01	1.58E-01
AC-228	9.70E-01	2.65E-01	9.91E-02
TH-228	1.02E+00	3.21E-01	5.67E-01
RA-224	8.13E-01	3.16E-01	1.00E-01
PB-212	9.59E-01	1.62E-01	4.46E-02
BI-212	1.03E+00	8.09E-01	3.82E-01
TL-208	8.54E-01	2.02E-01	7.90E-02
U-235	~~1.35E-01~~	~~2.34E-01~~	2.72E-01 Not detected 10/21/97
TH-231	Not Detected	---	1.40E+01
PA-231	Not Detected	---	1.57E+00
TH-227	Not Detected	---	3.99E-01
RA-223	Not Detected	---	2.44E-01
RN-219	Not Detected	---	4.21E-01
PB-211	Not Detected	---	9.42E-01
TL-207	Not Detected	---	1.54E+01
AM-241	Not Detected	---	5.28E-01
PU-239	Not Detected	---	4.98E+02
NP-237	Not Detected	---	4.33E-01
PA-233	Not Detected	---	6.52E-02
TH-229	Not Detected	---	2.76E-01

[Summary Report] - Sample ID: : 70182401

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.47E-02
AG-110m	Not Detected	---	3.81E-02
BA-133	Not Detected	---	7.45E-02
BE-7	Not Detected	---	2.91E-01
CD-109	~~1.60E+00~~	~~9.21E-01~~	1.10E+00 Not detected 10/21/97
CD-115	Not Detected	---	1.37E-01
CE-139	Not Detected	---	3.27E-02
CE-141	Not Detected	---	6.10E-02
CE-144	Not Detected	---	2.69E-01
CO-56	Not Detected	---	3.93E-02
CO-57	Not Detected	---	3.38E-02
CO-58	Not Detected	---	3.57E-02
CO-60	Not Detected	---	4.03E-02
CR-51	Not Detected	---	2.71E-01
CS-134	Not Detected	---	5.09E-02
CS-137	4.71E-02	2.53E-02	2.46E-02
EU-152	Not Detected	---	1.01E-01
EU-154	Not Detected	---	2.08E-01
EU-155	Not Detected	---	1.63E-01
FE-59	Not Detected	---	7.85E-02
GD-153	Not Detected	---	1.18E-01
HG-203	Not Detected	---	3.56E-02
I-131	Not Detected	---	3.77E-02
IR-192	Not Detected	---	3.19E-02
K-40	1.73E+01	2.65E+00	4.77E-01
MN-52	Not Detected	---	4.02E-02
MN-54	Not Detected	---	3.84E-02
MO-99	Not Detected	---	4.15E-01
NA-22	Not Detected	---	4.75E-02
NA-24	Not Detected	---	3.00E-01
NB-95	Not Detected	---	2.68E-01
ND-147	Not Detected	---	2.63E-01
NI-57	Not Detected	---	6.61E-02
RU-103	Not Detected	---	3.33E-02
RU-106	Not Detected	---	3.36E-01
SB-122	Not Detected	---	7.00E-02
SB-124	Not Detected	---	3.36E-02
SB-125	Not Detected	---	8.94E-02
SN-113	Not Detected	---	4.16E-02
SR-85	Not Detected	---	4.24E-02
TA-182	Not Detected	---	1.69E-01
TA-183	Not Detected	---	5.84E-01
TC-99m	Not Detected	---	7.79E+00
TL-201	Not Detected	---	3.17E-01
XE-133	Not Detected	---	3.00E-01
Y-88	Not Detected	---	2.85E-02
ZN-65	Not Detected	---	1.13E-01
ZR-95	Not Detected	---	6.41E-02

```
******************************************************************************
*                     Sandia National Laboratories                           *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]        *
*                        10-21-97  5:03:30 PM                                *
******************************************************************************
*                                                                            *
* Analyzed by:               10/21/97      Reviewed by:        10/23/97      *
******************************************************************************
Customer                     : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID           : 036213-002
Lab Sample ID                : 70182402

Sample Description           : MARINELLI SOLID SAMPLE
Sample Quantity              :    722.000  gram
Sample Date/Time             : 10-16-97    9:57:00 AM
Acquire Start Date/Time      : 10-18-97   10:27:30 AM
Detector Name                : LAB02
Elapsed Live/Real Time       :    6000 /    6003 seconds

Comments:
******************************************************************************
```

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	3.34E+00
TH-234	1.26E+00	4.32E-01	6.63E-01
RA-226	1.42E+00	6.47E-01	6.11E-01
PB-214	5.68E-01	1.05E-01	4.85E-02
BI-214	5.54E-01	1.15E-01	4.49E-02
PB-210	Not Detected	---------	3.56E+01
TH-232	9.14E-01	4.62E-01	1.37E-01
RA-228	8.66E-01	2.44E-01	1.49E-01
AC-228	9.00E-01	2.58E-01	7.78E-02
TH-228	7.85E-01	2.44E-01	4.60E-01
RA-224	9.25E-01	2.97E-01	7.24E-02
PB-212	8.26E-01	4.09E-01	4.01E-02
BI-212	9.50E-01	4.41E-01	3.16E-01
TL-208	8.21E-01	1.71E-01	6.94E-02
U-235	Not Detected	---------	2.49E-01
TH-231	Not Detected	---------	1.29E+01
PA-231	Not Detected	---------	1.45E+00
TH-227	Not Detected	---------	3.52E-01
RA-223	Not Detected	---------	2.25E-01
RN-219	Not Detected	---------	3.71E-01
PB-211	Not Detected	---------	8.41E-01
TL-207	Not Detected	---------	1.36E+01
AM-241	Not Detected	---------	4.90E-01
PU-239	Not Detected	---------	4.48E+02
NP-237	Not Detected	---------	3.19E-01
PA-233	Not Detected	---------	5.89E-02
TH-229	Not Detected	---------	2.57E-01

[Summary Report] - Sample ID: : 70182402

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.26E-02
AG-110m	Not Detected	---	4.02E-02
BA-133	Not Detected	---	6.32E-02
BE-7	Not Detected	---	2.56E-01
CD-109	~~2.38E+00~~	~~7.14E-01~~	1.08E+00 Not detected 10/24/97
CD-115	Not Detected	---	1.27E-01
CE-139	Not Detected	---	2.92E-02
CE-141	Not Detected	---	5.62E-02
CE-144	Not Detected	---	2.43E-01
CO-56	Not Detected	---	3.63E-02
CO-57	Not Detected	---	3.09E-02
CO-58	Not Detected	---	3.12E-02
CO-60	Not Detected	---	3.76E-02
CR-51	Not Detected	---	2.41E-01
CS-134	Not Detected	---	4.44E-02
CS-137	1.07E-01	3.35E-02	2.43E-02
EU-152	Not Detected	---	9.27E-02
EU-154	Not Detected	---	1.96E-01
EU-155	Not Detected	---	1.52E-01
FE-59	Not Detected	---	7.14E-02
GD-153	Not Detected	---	1.08E-01
HG-203	Not Detected	---	3.27E-02
I-131	Not Detected	---	3.56E-02
IR-192	Not Detected	---	2.76E-02
K-40	1.69E+01	2.57E+00	4.36E-01
MN-52	Not Detected	---	3.92E-02
MN-54	Not Detected	---	3.52E-02
MO-99	Not Detected	---	4.00E-01
NA-22	Not Detected	---	4.05E-02
NA-24	Not Detected	---	3.17E-01
NB-95	Not Detected	---	2.40E-01
ND-147	Not Detected	---	2.17E-01
NI-57	Not Detected	---	7.17E-02
RU-103	Not Detected	---	3.03E-02
RU-106	Not Detected	---	2.87E-01
SB-122	Not Detected	---	6.73E-02
SB-124	Not Detected	---	3.09E-02
SB-125	Not Detected	---	8.54E-02
SN-113	Not Detected	---	3.72E-02
SR-85	Not Detected	---	3.84E-02
TA-182	Not Detected	---	1.44E-01
TA-183	Not Detected	---	5.48E-01
TC-99m	Not Detected	---	8.71E+00
TL-201	Not Detected	---	2.92E-01
XE-133	Not Detected	---	2.82E-01
Y-88	Not Detected	---	2.29E-02
ZN-65	Not Detected	---	9.92E-02
ZR-95	Not Detected	---	5.35E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-21-97 5:21:42 PM *
****

* Analyzed by: 10/21/97 Reviewed by: 10/23/97 *

****

Customer : C.BYRD/D.BISWELL (6134/SM0)
Customer Sample ID : 036214-002
Lab Sample ID : 70182403

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 692.000 gram
Sample Date/Time : 10-16-97 9:55:00 AM
Acquire Start Date/Time : 10-18-97 12:12:35 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.42E+00
TH-234	1.18E+00	5.18E-01	6.73E-01
RA-226	1.28E+00	5.15E-01	5.71E-01
PB-214	6.08E-01	1.17E-01	4.72E-02
BI-214	5.93E-01	1.19E-01	4.82E-02
PB-210	Not Detected	---	3.60E+01
TH-232	7.28E-01	3.84E-01	1.55E-01
RA-228	8.57E-01	2.49E-01	1.45E-01
AC-228	8.31E-01	1.98E-01	8.10E-02
TH-228	7.73E-01	3.53E-01	5.03E-01
RA-224	7.73E-01	3.48E-01	7.63E-02
PB-212	8.07E-01	1.19E-01	4.23E-02
BI-212	7.26E-01	2.41E-01	3.13E-01
TL-208	6.93E-01	1.74E-01	7.60E-02
U-235	Not Detected	---	2.52E-01
TH-231	Not Detected	---	1.30E+01
PA-231	Not Detected	---	1.47E+00
TH-227	Not Detected	---	3.61E-01
RA-223	Not Detected	---	2.31E-01
RN-219	Not Detected	---	3.80E-01
PB-211	Not Detected	---	8.50E-01
TL-207	Not Detected	---	1.39E+01
AM-241	Not Detected	---	4.88E-01
PU-239	Not Detected	---	4.60E+02
NP-237	Not Detected	---	3.34E-01
PA-233	Not Detected	---	6.11E-02
TH-229	Not Detected	---	2.63E-01

[Summary Report] - Sample ID: : 70182403

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.12E-02
AG-110m	Not Detected	---------	4.23E-02
BA-133	Not Detected	---------	6.65E-02
BE-7	Not Detected	---------	2.72E-01
CD-109	~~1.88E+00~~	~~9.92E-01~~	1.14E+00
CD-115	Not Detected	---------	1.30E-01
CE-139	Not Detected	---------	3.10E-02
CE-141	Not Detected	---------	5.58E-02
CE-144	Not Detected	---------	2.48E-01
CO-56	Not Detected	---------	3.72E-02
CO-57	Not Detected	---------	3.18E-02
CO-58	Not Detected	---------	3.37E-02
CO-60	Not Detected	---------	3.77E-02
CR-51	Not Detected	---------	2.53E-01
CS-134	Not Detected	---------	4.74E-02
CS-137	1.08E-01	3.63E-02	2.35E-02
EU-152	Not Detected	---------	9.54E-02
EU-154	Not Detected	---------	1.91E-01
EU-155	Not Detected	---------	1.55E-01
FE-59	Not Detected	---------	7.48E-02
GD-153	Not Detected	---------	1.10E-01
HG-203	Not Detected	---------	3.28E-02
I-131	Not Detected	---------	3.43E-02
IR-192	Not Detected	---------	2.91E-02
K-40	1.66E+01	2.48E+00	4.45E-01
MN-52	Not Detected	---------	3.88E-02
MN-54	Not Detected	---------	3.40E-02
MO-99	Not Detected	---------	4.02E-01
NA-22	Not Detected	---------	4.45E-02
NA-24	Not Detected	---------	3.58E-01
NB-95	Not Detected	---------	2.50E-01
ND-147	Not Detected	---------	2.38E-01
NI-57	~~1.03E-01~~	~~1.52E-02~~	7.02E-02
RU-103	Not Detected	---------	2.89E-02
RU-106	Not Detected	---------	2.89E-01
SB-122	Not Detected	---------	6.78E-02
SB-124	Not Detected	---------	3.12E-02
SB-125	Not Detected	---------	8.62E-02
SN-113	Not Detected	---------	3.84E-02
SR-85	Not Detected	---------	3.93E-02
TA-182	Not Detected	---------	1.50E-01
TA-183	Not Detected	---------	5.52E-01
TC-99m	Not Detected	---------	1.09E+01
TL-201	Not Detected	---------	3.05E-01
XE-133	Not Detected	---------	2.89E-01
Y-88	Not Detected	---------	2.83E-02
ZN-65	Not Detected	---------	1.02E-01
ZR-95	Not Detected	---------	5.93E-02

~~1.88E+00~~ ~~9.92E-01~~ 1.14E+00 not detected J 10/21/97

~~1.03E-01~~ ~~1.52E-02~~ 7.02E-02 Not detected J 10/21/97

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-21-97 5:57:11 PM *
****
*
* Analyzed by: 10/21/97 Reviewed by: 10/22/97 *
****

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036216-002
Lab Sample ID : 70182404

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 761.000 gram
Sample Date/Time : 10-16-97 10:07:00 AM
Acquire Start Date/Time : 10-18-97 2:03:58 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.22E+00
TH-234	1.02E+00	3.94E-01	5.94E-01
RA-226	1.30E+00	4.75E-01	5.39E-01
PB-214	5.76E-01	1.02E-01	4.36E-02
BI-214	5.44E-01	1.19E-01	4.45E-02
PB-210	Not Detected	---	3.39E+01
TH-232	7.19E-01	3.64E-01	1.46E-01
RA-228	8.66E-01	2.33E-01	1.38E-01
AC-228	9.17E-01	2.20E-01	7.89E-02
TH-228	7.09E-01	2.31E-01	4.64E-01
RA-224	8.59E-01	2.86E-01	6.26E-02
PB-212	8.07E-01	1.68E-01	4.05E-02
BI-212	8.80E-01	3.00E-01	2.69E-01
TL-208	7.26E-01	2.39E-01	6.41E-02
U-235	Not Detected	---	2.37E-01
TH-231	~~3.42E+00~~	~~4.07E+00~~	1.18E+01 Not detected 10/21/97
PA-231	Not Detected	---	1.38E+00
TH-227	Not Detected	---	3.39E-01
RA-223	Not Detected	---	2.08E-01
RN-219	Not Detected	---	3.65E-01
PB-211	Not Detected	---	8.27E-01
TL-207	Not Detected	---	1.30E+01
AM-241	Not Detected	---	4.76E-01
PU-239	Not Detected	---	4.31E+02
NP-237	Not Detected	---	3.65E-01
PA-233	Not Detected	---	5.66E-02
TH-229	Not Detected	---	2.48E-01

[Summary Report] - Sample ID: : 70182404

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.94E-02
AG-110m	Not Detected	---	4.09E-02
BA-133	Not Detected	---	6.13E-02
BE-7	Not Detected	---	2.53E-01
CD-109	~~1.72E+00~~	~~6.63E-01~~	9.61E-01
CD-115	Not Detected	---	1.25E-01
CE-139	Not Detected	---	2.90E-02
CE-141	Not Detected	---	5.36E-02
CE-144	Not Detected	---	2.38E-01
CO-56	Not Detected	---	3.40E-02
CO-57	Not Detected	---	3.02E-02
CO-58	Not Detected	---	3.17E-02
CO-60	Not Detected	---	3.39E-02
CR-51	Not Detected	---	2.33E-01
CS-134	Not Detected	---	4.42E-02
CS-137	1.27E-01	3.70E-02	2.27E-02
EU-152	Not Detected	---	9.07E-02
EU-154	Not Detected	---	1.81E-01
EU-155	Not Detected	---	1.44E-01
FE-59	Not Detected	---	6.75E-02
GD-153	Not Detected	---	1.02E-01
HG-203	Not Detected	---	3.12E-02
I-131	Not Detected	---	3.31E-02
IR-192	Not Detected	---	2.64E-02
K-40	1.67E+01	2.50E+00	4.13E-01
MN-52	Not Detected	---	3.51E-02
MN-54	Not Detected	---	3.33E-02
MO-99	Not Detected	---	3.98E-01
NA-22	Not Detected	---	3.90E-02
NA-24	Not Detected	---	3.57E-01
NB-95	Not Detected	---	2.38E-01
ND-147	Not Detected	---	2.21E-01
NI-57	Not Detected	---	6.85E-02
RU-103	Not Detected	---	2.90E-02
RU-106	Not Detected	---	2.86E-01
SB-122	Not Detected	---	6.62E-02
SB-124	Not Detected	---	3.05E-02
SB-125	Not Detected	---	7.89E-02
SN-113	Not Detected	---	3.54E-02
SR-85	Not Detected	---	3.65E-02
TA-182	Not Detected	---	1.35E-01
TA-183	Not Detected	---	5.47E-01
TC-99m	Not Detected	---	1.22E+01
TL-201	Not Detected	---	2.88E-01
XE-133	Not Detected	---	2.72E-01
Y-88	Not Detected	---	2.51E-02
ZN-65	Not Detected	---	9.38E-02
ZR-95	Not Detected	---	5.59E-02

Not detected 10/21/97

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*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program [881 Laboratory]
* 10-21-97 6:37:05 PM
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Analyzed by: 10/22/97 Reviewed by: 10/23/97

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036217-002
Lab Sample ID : 70182405

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 660.000 gram
Sample Date/Time : 10-16-97 10:15:00 AM
Acquire Start Date/Time : 10-18-97 3:49:37 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.69E+00
TH-234	1.17E+00	5.61E-01	7.11E-01
RA-226	1.59E+00	8.16E-01	6.51E-01
PB-214	6.73E-01	5.49E-01	5.40E-02
BI-214	5.88E-01	2.05E-01	5.08E-02
PB-210	Not Detected	---	3.93E+01
TH-232	7.92E-01	4.36E-01	1.80E-01
RA-228	1.03E+00	3.07E-01	1.51E-01
AC-228	8.66E-01	2.16E-01	9.03E-02
TH-228	6.75E-01	2.73E-01	5.71E-01
RA-224	9.23E-01	4.36E-01	9.02E-02
PB-212	8.94E-01	1.52E-01	4.55E-02
BI-212	1.08E+00	5.69E-01	3.01E-01
TL-208	8.21E-01	5.17E-01	7.50E-02
U-235	Not Detected	---	2.70E-01
TH-231	Not Detected	---	1.42E+01
PA-231	Not Detected	---	1.63E+00
TH-227	Not Detected	---	3.89E-01
RA-223	Not Detected	---	2.54E-01
RN-219	Not Detected	---	4.25E-01
PB-211	Not Detected	---	9.84E-01
TL-207	Not Detected	---	1.39E+01
AM-241	Not Detected	---	5.33E-01
PU-239	Not Detected	---	5.05E+02
NP-237	Not Detected	---	3.50E-01
PA-233	Not Detected	---	6.78E-02
TH-229	Not Detected	---	2.81E-01

[Summary Report] - Sample ID: : 70182405

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.48E-02
AG-110m	Not Detected	---	8.99E-02
BA-133	Not Detected	---	7.16E-02
BE-7	Not Detected	---	3.14E-01
CD-109	~~1.71E+00~~	~~7.26E-01~~	1.19E+00 Not detected J 10/22/97
CD-115	Not Detected	---	1.51E-01
CE-139	Not Detected	---	3.32E-02
CE-141	Not Detected	---	6.18E-02
CE-144	Not Detected	---	2.73E-01
CO-56	Not Detected	---	4.02E-02
CO-57	Not Detected	---	3.35E-02
CO-58	Not Detected	---	3.57E-02
CO-60	Not Detected	---	3.91E-02
CR-51	Not Detected	---	2.96E-01
CS-134	Not Detected	---	4.94E-02
CS-137	9.26E-01	1.40E-01	2.69E-02
EU-152	Not Detected	---	1.00E-01
EU-154	Not Detected	---	2.06E-01
EU-155	Not Detected	---	1.66E-01
FE-59	Not Detected	---	7.86E-02
GD-153	Not Detected	---	1.18E-01
HG-203	Not Detected	---	3.70E-02
I-131	Not Detected	---	4.05E-02
IR-192	Not Detected	---	3.29E-02
K-40	1.78E+01	2.69E+00	4.59E-01
MN-52	Not Detected	---	4.10E-02
MN-54	Not Detected	---	3.82E-02
MO-99	Not Detected	---	4.53E-01
NA-22	Not Detected	---	4.42E-02
NA-24	Not Detected	---	4.20E-01
NB-95	Not Detected	---	2.76E-01
ND-147	Not Detected	---	2.53E-01
NI-57	Not Detected	---	7.45E-02
RU-103	Not Detected	---	3.61E-02
RU-106	Not Detected	---	3.24E-01
SB-122	Not Detected	---	8.00E-02
SB-124	Not Detected	---	3.49E-02
SB-125	Not Detected	---	1.03E-01
SN-113	Not Detected	---	4.58E-02
SR-85	Not Detected	---	4.28E-02
TA-182	Not Detected	---	1.58E-01
TA-183	Not Detected	---	6.26E-01
TC-99m	Not Detected	---	1.75E+01
TL-201	Not Detected	---	3.33E-01
XE-133	Not Detected	---	3.27E-01
Y-88	Not Detected	---	2.85E-02
ZN-65	Not Detected	---	1.07E-01
ZR-95	Not Detected	---	6.42E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
10-22-97 10:43:47 AM
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* Analyzed by: 10/22/97 Reviewed by: 10/23/97
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Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036218-002
Lab Sample ID : 70182406

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 707.000 gram
Sample Date/Time : 10-16-97 10:17:00 AM
Acquire Start Date/Time : 10-18-97 5:42:00 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.42E+00
TH-234	1.09E+00	4.59E-01	6.40E-01
RA-226	1.80E+00	5.83E-01	5.96E-01
PB-214	6.93E-01	1.31E-01	4.80E-02
BI-214	6.00E-01	1.70E-01	4.65E-02
PB-210	Not Detected	---	3.64E+01
TH-232	8.02E-01	4.18E-01	1.49E-01
RA-228	7.76E-01	2.33E-01	1.51E-01
AC-228	7.94E-01	1.96E-01	8.72E-02
TH-228	9.25E-01	2.76E-01	4.94E-01
RA-224	8.70E-01	3.17E-01	8.01E-02
PB-212	8.62E-01	1.48E-01	4.20E-02
BI-212	9.98E-01	4.88E-01	3.40E-01
TL-208	7.85E-01	1.66E-01	6.87E-02
U-235	Not Detected	---	2.53E-01
TH-231	Not Detected	---	1.31E+01
PA-231	Not Detected	---	1.45E+00
TH-227	Not Detected	---	3.71E-01
RA-223	Not Detected	---	2.34E-01
RN-219	Not Detected	---	3.96E-01
PB-211	Not Detected	---	9.14E-01
TL-207	Not Detected	---	1.42E+01
AM-241	Not Detected	---	4.88E-01
PU-239	Not Detected	---	4.74E+02
NP-237	Not Detected	---	4.00E-01
PA-233	Not Detected	---	6.02E-02
TH-229	Not Detected	---	2.64E-01

[Summary Report] - Sample ID: : 70182406

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.07E-02
AG-110m	Not Detected	---	5.00E-02
BA-133	Not Detected	---	6.97E-02
BE-7	Not Detected	---	2.78E-01
CD-109	~~1.71E+00~~	~~6.26E-01~~	1.06E+00 Not Detected 10/22/97
CD-115	Not Detected	---	1.42E-01
CE-139	Not Detected	---	3.07E-02
CE-141	Not Detected	---	5.70E-02
CE-144	Not Detected	---	2.56E-01
CO-56	Not Detected	---	3.64E-02
CO-57	Not Detected	---	3.20E-02
CO-58	Not Detected	---	3.40E-02
CO-60	Not Detected	---	3.66E-02
CR-51	Not Detected	---	2.54E-01
CS-134	Not Detected	---	4.73E-02
CS-137	2.10E-01	4.91E-02	2.32E-02
EU-152	Not Detected	---	9.59E-02
EU-154	Not Detected	---	1.87E-01
EU-155	Not Detected	---	1.58E-01
FE-59	Not Detected	---	7.48E-02
GD-153	Not Detected	---	1.10E-01
HG-203	Not Detected	---	3.37E-02
I-131	Not Detected	---	3.66E-02
IR-192	Not Detected	---	2.86E-02
K-40	1.82E+01	2.71E+00	4.25E-01
MN-52	Not Detected	---	4.19E-02
MN-54	Not Detected	---	2.08E-02
MO-99	Not Detected	---	4.63E-01
NA-22	Not Detected	---	4.42E-02
NA-24	Not Detected	---	4.41E-01
NB-95	Not Detected	---	2.68E-01
ND-147	Not Detected	---	2.44E-01
NI-57	Not Detected	---	1.46E-01
RU-103	Not Detected	---	3.14E-02
RU-106	Not Detected	---	3.09E-01
SB-122	Not Detected	---	7.69E-02
SB-124	Not Detected	---	3.13E-02
SB-125	Not Detected	---	8.71E-02
SN-113	Not Detected	---	4.04E-02
SR-85	Not Detected	---	3.90E-02
TA-182	Not Detected	---	1.50E-01
TA-183	Not Detected	---	5.76E-01
TC-99m	Not Detected	---	1.99E+01
TL-201	Not Detected	---	3.20E-01
XE-133	Not Detected	---	3.10E-01
Y-88	Not Detected	---	2.55E-02
ZN-65	Not Detected	---	1.01E-01
ZR-95	Not Detected	---	5.67E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-22-97 12:22:31 PM *
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* Analyzed by: 10/22/97 Reviewed by: 10/23/97 *

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036219-002
Lab Sample ID : 70182407

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 829.000 gram
Sample Date/Time : 10-16-97 10:30:00 AM
Acquire Start Date/Time : 10-18-97 7:34:09 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.10E+00
TH-234	1.10E+00	5.47E-01	5.86E-01
RA-226	1.58E+00	8.21E-01	5.32E-01
PB-214	5.56E-01	1.60E-01	4.24E-02
BI-214	5.65E-01	1.06E-01	4.34E-02
PB-210	Not Detected	---	3.27E+01
TH-232	7.59E-01	3.75E-01	1.24E-01
RA-228	7.97E-01	2.14E-01	1.44E-01
AC-228	7.79E-01	3.19E-01	8.35E-02
TH-228	6.60E-01	2.27E-01	4.42E-01
RA-224	7.86E-01	2.30E-01	7.39E-02
PB-212	7.56E-01	1.35E-01	3.85E-02
BI-212	7.68E-01	3.30E-01	2.94E-01
TL-208	6.92E-01	1.40E-01	6.21E-02
U-235	Not Detected	---	2.27E-01
~~TH-231~~	~~3.31E+00~~	~~6.19E+00~~	1.19E+01 not detected 10/22/97
PA-231	Not Detected	---	1.34E+00
TH-227	Not Detected	---	3.17E-01
RA-223	Not Detected	---	2.10E-01
RN-219	Not Detected	---	3.45E-01
PB-211	Not Detected	---	7.99E-01
TL-207	Not Detected	---	1.27E+01
AM-241	Not Detected	---	4.41E-01
PU-239	Not Detected	---	4.16E+02
~~NP-237~~	~~6.44E-01~~	~~2.76E-01~~	2.90E-01 Not detected 10/22/97
PA-233	Not Detected	---	5.39E-02
TH-229	Not Detected	---	2.38E-01

[Summary Report] - Sample ID: : 70182407

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected		3.61E-02
AG-110m	Not Detected		4.06E-02
BA-133	Not Detected		5.87E-02
BE-7	Not Detected		2.43E-01
CD-109	Not Detected		9.85E-01
CD-115	Not Detected		1.29E-01
CE-139	Not Detected		2.77E-02
CE-141	Not Detected		5.16E-02
CE-144	Not Detected		2.30E-01
CO-56	Not Detected		3.39E-02
CO-57	Not Detected		2.88E-02
CO-58	Not Detected		2.91E-02
CO-60	Not Detected		3.07E-02
CR-51	Not Detected		2.40E-01
CS-134	Not Detected		4.26E-02
CS-137	1.55E-01	4.71E-02	2.11E-02
EU-152	Not Detected		8.64E-02
EU-154	Not Detected		1.68E-01
EU-155	Not Detected		1.39E-01
FE-59	Not Detected		6.86E-02
GD-153	Not Detected		9.82E-02
HG-203	Not Detected		3.07E-02
I-131	Not Detected		3.31E-02
IR-192	Not Detected		2.67E-02
K-40	1.79E+01	2.61E+00	3.76E-01
MN-52	Not Detected		3.37E-02
MN-54	Not Detected		3.25E-02
MO-99	Not Detected		4.06E-01
NA-22	Not Detected		3.89E-02
NA-24	Not Detected		4.19E-01
NB-95	Not Detected		2.32E-01
ND-147	Not Detected		2.21E-01
NI-57	Not Detected		1.35E-01
RU-103	Not Detected		2.86E-02
RU-106	Not Detected		2.69E-01
SB-122	Not Detected		6.68E-02
SB-124	Not Detected		2.83E-02
SB-125	Not Detected		7.87E-02
SN-113	Not Detected		3.38E-02
SR-85	Not Detected		3.52E-02
TA-182	Not Detected		1.31E-01
TA-183	Not Detected		5.20E-01
TC-99m	Not Detected		2.15E+01
TL-201	Not Detected		2.94E-01
XE-133	Not Detected		2.87E-01
Y-88	Not Detected		2.53E-02
ZN-65	Not Detected		9.08E-02
ZR-95	Not Detected		5.31E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-22-97 12:37:12 PM *
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* Analyzed by: 10/22/97 Reviewed by: 10/23/97 *

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036221-002
Lab Sample ID : 70182408

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 716.000 gram
Sample Date/Time : 10-16-97 10:35:00 AM
Acquire Start Date/Time : 10-18-97 9:19:16 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.41E+00
TH-234	1.17E+00	6.39E-01	6.25E-01
RA-226	1.53E+00	6.00E-01	5.81E-01
PB-214	6.52E-01	1.26E-01	4.79E-02
BI-214	6.07E-01	1.37E-01	4.54E-02
PB-210	Not Detected	---	3.61E+01
TH-232	8.68E-01	4.33E-01	1.49E-01
RA-228	7.58E-01	2.26E-01	1.55E-01
AC-228	7.89E-01	1.93E-01	8.36E-02
TH-228	8.06E-01	2.65E-01	5.08E-01
RA-224	8.28E-01	2.76E-01	7.56E-02
PB-212	7.90E-01	1.38E-01	4.06E-02
BI-212	1.09E+00	5.61E-01	3.15E-01
TL-208	6.87E-01	1.51E-01	6.50E-02
U-235	Not Detected	---	2.45E-01
TH-231	Not Detected	---	1.28E+01
PA-231	Not Detected	---	1.45E+00
TH-227	Not Detected	---	3.54E-01
RA-223	Not Detected	---	2.34E-01
RN-219	Not Detected	---	3.96E-01
PB-211	Not Detected	---	8.89E-01
TL-207	Not Detected	---	1.44E+01
AM-241	Not Detected	---	4.80E-01
PU-239	Not Detected	---	4.56E+02
NP-237	Not Detected	---	4.00E-01
PA-233	Not Detected	---	5.88E-02
TH-229	Not Detected	---	2.57E-01

[Summary Report] - Sample ID: : 70182408

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.22E-02
AG-110m	Not Detected	---------	3.91E-02
BA-133	Not Detected	---------	6.67E-02
BE-7	Not Detected	---------	2.75E-01
CD-109	~~1.79E+00~~	~~8.75E-01~~	9.96E-01 Not detected 10/22/97
CD-115	Not Detected	---------	1.46E-01
CE-139	Not Detected	---------	3.00E-02
CE-141	Not Detected	---------	5.61E-02
CE-144	Not Detected	---------	2.49E-01
CO-56	Not Detected	---------	3.73E-02
CO-57	Not Detected	---------	3.25E-02
CO-58	Not Detected	---------	3.26E-02
CO-60	Not Detected	---------	3.63E-02
CR-51	Not Detected	---------	2.57E-01
CS-134	Not Detected	---------	4.70E-02
CS-137	8.59E-02	4.49E-02	2.66E-02
EU-152	Not Detected	---------	9.74E-02
EU-154	Not Detected	---------	1.94E-01
EU-155	Not Detected	---------	1.54E-01
FE-59	Not Detected	---------	7.73E-02
GD-153	Not Detected	---------	1.06E-01
HG-203	Not Detected	---------	3.29E-02
I-131	Not Detected	---------	3.53E-02
IR-192	Not Detected	---------	2.90E-02
K-40	1.80E+01	2.70E+00	4.48E-01
MN-52	Not Detected	---------	4.05E-02
MN-54	Not Detected	---------	3.45E-02
MO-99	Not Detected	---------	4.50E-01
NA-22	Not Detected	---------	4.30E-02
NA-24	Not Detected	---------	5.25E-01
NB-95	Not Detected	---------	2.62E-01
ND-147	Not Detected	---------	2.28E-01
NI-57	Not Detected	---------	8.62E-02
RU-103	Not Detected	---------	3.09E-02
RU-106	Not Detected	---------	2.89E-01
SB-122	Not Detected	---------	7.74E-02
SB-124	Not Detected	---------	3.14E-02
SB-125	Not Detected	---------	8.45E-02
SN-113	Not Detected	---------	3.85E-02
SR-85	Not Detected	---------	3.96E-02
TA-182	Not Detected	---------	1.53E-01
TA-183	Not Detected	---------	5.74E-01
TC-99m	Not Detected	---------	2.84E+01
TL-201	Not Detected	---------	3.28E-01
XE-133	Not Detected	---------	3.19E-01
Y-88	Not Detected	---------	2.87E-02
ZN-65	Not Detected	---------	1.03E-01
ZR-95	Not Detected	---------	5.77E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-22-97 2:16:05 PM *
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* Analyzed by: 10/22/97 Reviewed by: 10/23/97 *

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036222-002
Lab Sample ID : 70182409

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 686.000 gram
Sample Date/Time : 10-16-97 10:37:00 AM
Acquire Start Date/Time : 10-18-97 11:04:12 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.49E+00
TH-234	1.17E+00	5.40E-01	6.34E-01
RA-226	1.72E+00	6.44E-01	6.35E-01
PB-214	6.77E-01	1.26E-01	4.99E-02
BI-214	6.30E-01	2.91E-01	4.95E-02
PB-210	Not Detected	---	3.69E+01
TH-232	7.81E-01	4.14E-01	1.65E-01
RA-228	7.65E-01	3.02E-01	1.56E-01
AC-228	8.20E-01	2.28E-01	9.16E-02
TH-228	1.00E+00	3.07E-01	5.06E-01
RA-224	8.88E-01	2.81E-01	8.60E-02
PB-212	7.62E-01	1.38E-01	4.50E-02
BI-212	1.01E+00	3.52E-01	3.04E-01
TL-208	7.89E-01	1.71E-01	6.83E-02
U-235	Not Detected	---	2.49E-01
TH-231	Not Detected	---	1.30E+01
PA-231	Not Detected	---	1.52E+00
TH-227	Not Detected	---	3.59E-01
RA-223	Not Detected	---	2.38E-01
RN-219	Not Detected	---	3.86E-01
PB-211	Not Detected	---	9.08E-01
TL-207	Not Detected	---	1.41E+01
AM-241	Not Detected	---	4.92E-01
PU-239	Not Detected	---	4.65E+02
NP-237	Not Detected	---	4.07E-01
PA-233	Not Detected	---	6.14E-02
TH-229	Not Detected	---	2.63E-01

[Summary Report] - Sample ID: : 70182409

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.23E-02
AG-110m	Not Detected	---------	5.62E-02
BA-133	Not Detected	---------	7.01E-02
BE-7	Not Detected	---------	2.94E-01
CD-109	~~1.89E+00~~	~~6.69E-01~~	1.09E+00 Not detected 10/22/97
CD-115	Not Detected	---------	1.55E-01
CE-139	Not Detected	---------	3.09E-02
CE-141	Not Detected	---------	5.64E-02
CE-144	Not Detected	---------	2.54E-01
CO-56	Not Detected	---------	3.90E-02
CO-57	Not Detected	---------	3.28E-02
CO-58	Not Detected	---------	3.41E-02
CO-60	Not Detected	---------	3.87E-02
CR-51	Not Detected	---------	2.60E-01
CS-134	Not Detected	---------	5.03E-02
CS-137	2.74E-01	6.06E-02	2.51E-02
EU-152	Not Detected	---------	9.82E-02
EU-154	Not Detected	---------	1.94E-01
EU-155	Not Detected	---------	1.55E-01
FE-59	Not Detected	---------	8.07E-02
GD-153	Not Detected	---------	1.12E-01
HG-203	Not Detected	---------	3.36E-02
I-131	Not Detected	---------	3.78E-02
IR-192	Not Detected	---------	2.87E-02
K-40	1.87E+01	2.78E+00	4.45E-01
MN-52	Not Detected	---------	4.12E-02
MN-54	Not Detected	---------	3.60E-02
MO-99	Not Detected	---------	4.88E-01
NA-22	Not Detected	---------	4.26E-02
NA-24	Not Detected	---------	5.42E-01
NB-95	Not Detected	---------	2.69E-01
ND-147	Not Detected	---------	2.42E-01
NI-57	Not Detected	---------	1.56E-01
RU-103	Not Detected	---------	3.25E-02
RU-106	Not Detected	---------	3.10E-01
SB-122	Not Detected	---------	8.03E-02
SB-124	Not Detected	---------	3.28E-02
SB-125	Not Detected	---------	8.82E-02
SN-113	Not Detected	---------	4.04E-02
SR-85	Not Detected	---------	3.95E-02
TA-182	Not Detected	---------	1.58E-01
TA-183	Not Detected	---------	6.00E-01
TC-99m	Not Detected	---------	3.50E+01
TL-201	Not Detected	---------	3.43E-01
XE-133	Not Detected	---------	3.31E-01
Y-88	Not Detected	---------	2.79E-02
ZN-65	Not Detected	---------	1.07E-01
ZR-95	Not Detected	---------	5.77E-02

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Sandia National Laboratories
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Radiation Protection Sample Diagnostics Program [881 Laboratory]
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10-22-97 3:30:32 PM
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* Analyzed by: 10/22/97 Reviewed by: 10/22/97
*
****

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036223-002
Lab Sample ID : 70182410

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 735.000 gram
Sample Date/Time : 10-16-97 10:45:00 AM
Acquire Start Date/Time : 10-19-97 12:49:09 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.15E+00
TH-234	9.26E-01	4.03E-01	5.93E-01
RA-226	1.37E+00	8.31E-01	4.96E-01
PB-214	5.71E-01	1.06E-01	4.48E-02
BI-214	5.04E-01	1.06E-01	4.63E-02
PB-210	Not Detected	---	3.35E+01
TH-232	7.41E-01	3.56E-01	1.31E-01
RA-228	7.78E-01	2.25E-01	1.35E-01
AC-228	6.90E-01	1.56E-01	7.92E-02
TH-228	7.63E-01	3.09E-01	4.62E-01
RA-224	7.32E-01	2.49E-01	7.85E-02
PB-212	7.12E-01	3.46E-01	3.80E-02
BI-212	8.71E-01	3.63E-01	3.11E-01
TL-208	6.51E-01	1.30E-01	6.55E-02
U-235	Not Detected	---	2.36E-01
TH-231	Not Detected	---	1.20E+01
PA-231	Not Detected	---	1.36E+00
TH-227	Not Detected	---	3.30E-01
RA-223	Not Detected	---	2.20E-01
RN-219	Not Detected	---	3.73E-01
PB-211	Not Detected	---	8.41E-01
TL-207	Not Detected	---	1.30E+01
AM-241	Not Detected	---	4.67E-01
PU-239	Not Detected	---	4.36E+02
NP-237	~~3.85E-01~~	~~1.59E-01~~	2.89E-01 Not detected 10/22/97
PA-233	Not Detected	---	5.90E-02
TH-229	Not Detected	---	2.43E-01

[Summary Report] - Sample ID: : 70182410

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.79E-02
AG-110m	Not Detected	---	5.70E-02
BA-133	Not Detected	---	6.20E-02
BE-7	Not Detected	---	2.72E-01
CD-109	Not Detected	---	9.83E-01
CD-115	Not Detected	---	1.43E-01
CE-139	Not Detected	---	2.80E-02
CE-141	Not Detected	---	5.35E-02
CE-144	Not Detected	---	2.39E-01
CO-56	Not Detected	---	3.42E-02
CO-57	Not Detected	---	2.92E-02
CO-58	Not Detected	---	3.10E-02
CO-60	Not Detected	---	3.40E-02
CR-51	Not Detected	---	2.43E-01
CS-134	Not Detected	---	4.33E-02
CS-137	3.44E-01	6.54E-02	2.32E-02
EU-152	Not Detected	---	8.77E-02
EU-154	Not Detected	---	1.75E-01
EU-155	Not Detected	---	1.42E-01
FE-59	Not Detected	---	6.79E-02
GD-153	Not Detected	---	1.02E-01
HG-203	Not Detected	---	3.10E-02
I-131	Not Detected	---	3.50E-02
IR-192	Not Detected	---	2.76E-02
K-40	1.59E+01	2.41E+00	4.28E-01
MN-52	Not Detected	---	3.78E-02
MN-54	Not Detected	---	3.32E-02
MO-99	Not Detected	---	4.46E-01
NA-22	Not Detected	---	3.86E-02
NA-24	Not Detected	---	5.66E-01
NB-95	Not Detected	---	2.51E-01
ND-147	Not Detected	---	2.29E-01
NI-57	Not Detected	---	1.46E-01
RU-103	Not Detected	---	2.98E-02
RU-106	Not Detected	---	2.82E-01
SB-122	Not Detected	---	7.53E-02
SB-124	Not Detected	---	2.94E-02
SB-125	Not Detected	---	8.23E-02
SN-113	Not Detected	---	3.80E-02
SR-85	Not Detected	---	3.65E-02
TA-182	Not Detected	---	1.37E-01
TA-183	Not Detected	---	5.71E-01
TC-99m	Not Detected	---	3.96E+01
TL-201	Not Detected	---	3.13E-01
XE-133	Not Detected	---	3.10E-01
Y-88	Not Detected	---	2.69E-02
ZN-65	Not Detected	---	9.44E-02
ZR-95	Not Detected	---	5.44E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
10-22-97 4:16:58 PM

Analyzed by: 10/22/97 Reviewed by: 10/23/97

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036224-002
Lab Sample ID : 70182411

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 661.000 gram
Sample Date/Time : 10-16-97 1:47:00 PM
Acquire Start Date/Time : 10-19-97 2:34:06 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.75E+00
TH-234	1.26E+00	4.94E-01	7.34E-01
RA-226	1.54E+00	8.47E-01	6.31E-01
PB-214	7.20E-01	2.41E-01	5.24E-02
BI-214	5.97E-01	1.23E-01	4.90E-02
PB-210	Not Detected	---	3.96E+01
TH-232	9.48E-01	4.57E-01	1.66E-01
RA-228	1.01E+00	2.76E-01	1.40E-01
AC-228	9.53E-01	2.15E-01	9.45E-02
TH-228	1.05E+00	3.18E-01	5.06E-01
RA-224	1.09E+00	3.11E-01	7.99E-02
PB-212	9.13E-01	1.41E-01	4.53E-02
BI-212	1.04E+00	5.45E-01	3.35E-01
TL-208	8.08E-01	1.64E-01	8.09E-02
U-235	Not Detected	---	2.79E-01
TH-231	Not Detected	---	1.40E+01
PA-231	Not Detected	---	1.63E+00
TH-227	Not Detected	---	3.97E-01
RA-223	Not Detected	---	2.52E-01
RN-219	Not Detected	---	4.23E-01
PB-211	Not Detected	---	9.86E-01
TL-207	Not Detected	---	1.46E+01
AM-241	Not Detected	---	5.29E-01
PU-239	Not Detected	---	5.12E+02
NP-237	~~6.31E-01~~	~~2.17E-01~~	3.45E-01 Not detected 10/22/97
PA-233	Not Detected	---	6.68E-02
TH-229	Not Detected	---	2.81E-01

[Summary Report] - Sample ID: : 70182411

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.50E-02
AG-110m	Not Detected	---	7.59E-02
BA-133	Not Detected	---	7.31E-02
BE-7	Not Detected	---	3.17E-01
CD-109	Not Detected	---	1.17E+00
CD-115	Not Detected	---	1.67E-01
CE-139	Not Detected	---	3.32E-02
CE-141	Not Detected	---	6.23E-02
CE-144	Not Detected	---	2.75E-01
CO-56	Not Detected	---	4.14E-02
CO-57	Not Detected	---	3.50E-02
CO-58	Not Detected	---	3.57E-02
CO-60	Not Detected	---	3.73E-02
CR-51	Not Detected	---	2.69E-01
CS-134	Not Detected	---	5.01E-02
CS-137	6.06E-01	9.84E-02	2.50E-02
EU-152	Not Detected	---	1.05E-01
EU-154	Not Detected	---	2.07E-01
EU-155	Not Detected	---	1.67E-01
FE-59	Not Detected	---	8.34E-02
GD-153	Not Detected	---	1.19E-01
HG-203	Not Detected	---	3.80E-02
I-131	Not Detected	---	4.16E-02
IR-192	Not Detected	---	3.15E-02
K-40	1.82E+01	2.72E+00	4.79E-01
MN-52	Not Detected	---	4.49E-02
MN-54	Not Detected	---	3.89E-02
MO-99	Not Detected	---	5.00E-01
NA-22	Not Detected	---	4.74E-02
NA-24	Not Detected	---	6.20E-01
NB-95	Not Detected	---	2.99E-01
ND-147	Not Detected	---	2.70E-01
NI-57	Not Detected	---	1.78E-01
RU-103	Not Detected	---	3.46E-02
RU-106	Not Detected	---	3.31E-01
SB-122	Not Detected	---	8.36E-02
SB-124	Not Detected	---	3.30E-02
SB-125	Not Detected	---	9.67E-02
SN-113	Not Detected	---	4.30E-02
SR-85	Not Detected	---	4.38E-02
TA-182	Not Detected	---	1.60E-01
TA-183	Not Detected	---	6.41E-01
TC-99m	Not Detected	---	4.06E+01
TL-201	Not Detected	---	3.69E-01
XE-133	Not Detected	---	3.57E-01
Y-88	Not Detected	---	3.09E-02
ZN-65	Not Detected	---	1.11E-01
ZR-95	Not Detected	---	6.24E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
10-22-97 4:36:00 PM
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Analyzed by: 10/22/97 Reviewed by: 10/23/97

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036226-002
Lab Sample ID : 70182412

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 685.000 gram
Sample Date/Time : 10-16-97 1:55:00 PM
Acquire Start Date/Time : 10-19-97 4:19:03 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.54E+00
TH-234	Not Detected	---	6.36E-01
RA-226	1.46E+00	7.52E-01	6.20E-01
PB-214	6.85E-01	1.30E-01	4.83E-02
BI-214	6.40E-01	1.39E-01	4.71E-02
PB-210	Not Detected	---	3.78E+01
TH-232	9.38E-01	4.79E-01	1.61E-01
RA-228	8.67E-01	2.72E-01	1.39E-01
AC-228	8.55E-01	3.13E-01	8.75E-02
TH-228	7.46E-01	2.53E-01	5.29E-01
RA-224	9.01E-01	2.63E-01	7.46E-02
PB-212	9.14E-01	1.50E-01	4.35E-02
BI-212	1.06E+00	4.45E-01	3.24E-01
TL-208	7.23E-01	2.15E-01	6.79E-02
U-235	Not Detected	---	2.67E-01
TH-231	Not Detected	---	1.37E+01
PA-231	Not Detected	---	1.52E+00
TH-227	Not Detected	---	3.82E-01
RA-223	Not Detected	---	2.50E-01
RN-219	Not Detected	---	4.23E-01
PB-211	Not Detected	---	9.53E-01
TL-207	Not Detected	---	1.47E+01
AM-241	Not Detected	---	5.14E-01
PU-239	Not Detected	---	4.77E+02
NP-237	Not Detected	---	4.18E-01
PA-233	Not Detected	---	6.42E-02
TH-229	Not Detected	---	2.70E-01

[Summary Report] - Sample ID: : 70182412

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.26E-02
AG-110m	Not Detected	---------	6.71E-02
BA-133	Not Detected	---------	7.04E-02
BE-7	Not Detected	---------	2.98E-01
CD-109	Not Detected	---------	1.02E+00
CD-115	Not Detected	---------	1.66E-01
CE-139	Not Detected	---------	3.18E-02
CE-141	Not Detected	---------	6.00E-02
CE-144	Not Detected	---------	2.61E-01
CO-56	Not Detected	---------	3.79E-02
CO-57	Not Detected	---------	3.30E-02
CO-58	Not Detected	---------	3.36E-02
CO-60	Not Detected	---------	3.79E-02
CR-51	Not Detected	---------	2.70E-01
CS-134	Not Detected	---------	5.04E-02
CS-137	4.60E-01	7.82E-02	2.44E-02
EU-152	Not Detected	---------	9.91E-02
EU-154	Not Detected	---------	1.96E-01
EU-155	Not Detected	---------	1.59E-01
FE-59	Not Detected	---------	7.28E-02
GD-153	Not Detected	---------	1.14E-01
HG-203	Not Detected	---------	3.54E-02
I-131	Not Detected	---------	3.96E-02
IR-192	Not Detected	---------	3.04E-02
K-40	1.81E+01	2.71E+00	4.49E-01
MN-52	Not Detected	---------	4.49E-02
MN-54	Not Detected	---------	1.95E-02
MO-99	Not Detected	---------	4.86E-01
NA-22	Not Detected	---------	4.48E-02
NA-24	Not Detected	---------	6.27E-01
NB-95	Not Detected	---------	2.91E-01
ND-147	Not Detected	---------	2.49E-01
NI-57	Not Detected	---------	1.72E-01
RU-103	Not Detected	---------	3.43E-02
RU-106	Not Detected	---------	3.01E-01
SB-122	Not Detected	---------	8.15E-02
SB-124	Not Detected	---------	3.38E-02
SB-125	Not Detected	---------	9.22E-02
SN-113	Not Detected	---------	4.16E-02
SR-85	Not Detected	---------	4.03E-02
TA-182	Not Detected	---------	1.55E-01
TA-183	Not Detected	---------	6.35E-01
TC-99m	Not Detected	---------	4.57E+01
TL-201	Not Detected	---------	3.56E-01
XE-133	Not Detected	---------	3.59E-01
Y-88	Not Detected	---------	2.70E-02
ZN-65	Not Detected	---------	1.10E-01
ZR-95	Not Detected	---------	6.18E-02

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**********************************************************************
*                    Sandia National Laboratories                    *
*   Radiation Protection Sample Diagnostics Program [881 Laboratory] *
*                       10-22-97  5:02:08 PM                         *
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*                                                                    *
* Analyzed by: [signature] 10/22/97    Reviewed by: [signature] 10/23/97 *
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Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036227-002
Lab Sample ID : 70182413

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 829.000 gram
Sample Date/Time : 10-16-97 2:00:00 PM
Acquire Start Date/Time : 10-19-97 8:11:25 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	3.20E+00
TH-234	1.17E+00	5.40E-01	6.52E-01
RA-226	1.53E+00	6.64E-01	5.42E-01
PB-214	6.54E-01	2.27E-01	4.39E-02
BI-214	5.61E-01	1.13E-01	4.34E-02
PB-210	Not Detected	---------	3.32E+01
TH-232	8.29E-01	3.92E-01	1.28E-01
RA-228	8.00E-01	7.58E-01	1.41E-01
AC-228	8.58E-01	2.14E-01	8.59E-02
TH-228	9.55E-01	2.77E-01	4.91E-01
RA-224	8.54E-01	2.80E-01	7.93E-02
PB-212	8.25E-01	1.29E-01	3.84E-02
BI-212	9.19E-01	3.14E-01	2.95E-01
TL-208	7.53E-01	1.71E-01	6.37E-02
U-235	~~2.23E-01~~	~~2.02E-01~~	2.34E-01 Not detected [signature] 10/22/97
TH-231	Not Detected	---------	1.21E+01
PA-231	Not Detected	---------	1.38E+00
TH-227	Not Detected	---------	3.34E-01
RA-223	Not Detected	---------	2.23E-01
RN-219	Not Detected	---------	3.63E-01
PB-211	Not Detected	---------	8.16E-01
TL-207	Not Detected	---------	1.30E+01
AM-241	Not Detected	---------	4.54E-01
PU-239	Not Detected	---------	4.25E+02
NP-237	~~5.02E-01~~	~~2.31E-01~~	3.11E-01 Not detected [signature] 10/22/97
PA-233	Not Detected	---------	5.36E-02
TH-229	Not Detected	---------	2.40E-01

[Summary Report] - Sample ID: : 70182413

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.76E-02
AG-110m	Not Detected	---------	4.54E-02
BA-133	Not Detected	---------	6.12E-02
BE-7	Not Detected	---------	2.48E-01
CD-109	Not Detected	---------	1.06E+00
CD-115	Not Detected	---------	1.47E-01
CE-139	Not Detected	---------	2.82E-02
CE-141	Not Detected	---------	5.26E-02
CE-144	Not Detected	---------	2.34E-01
CO-56	Not Detected	---------	3.28E-02
CO-57	Not Detected	---------	2.94E-02
CO-58	Not Detected	---------	2.93E-02
CO-60	Not Detected	---------	3.15E-02
CR-51	Not Detected	---------	2.36E-01
CS-134	Not Detected	---------	4.13E-02
CS-137	1.93E-01	4.94E-02	2.40E-02
EU-152	Not Detected	---------	8.81E-02
EU-154	Not Detected	---------	1.74E-01
EU-155	Not Detected	---------	1.45E-01
FE-59	Not Detected	---------	6.66E-02
GD-153	Not Detected	---------	1.02E-01
HG-203	Not Detected	---------	3.08E-02
I-131	Not Detected	---------	3.36E-02
IR-192	Not Detected	---------	2.63E-02
K-40	1.78E+01	4.13E+00	3.99E-01
MN-52	Not Detected	---------	3.81E-02
MN-54	Not Detected	---------	3.18E-02
MO-99	Not Detected	---------	4.55E-01
NA-22	Not Detected	---------	3.90E-02
NA-24	Not Detected	---------	6.45E-01
NB-95	Not Detected	---------	2.63E-01
ND-147	Not Detected	---------	2.22E-01
NI-57	Not Detected	---------	7.04E-02
RU-103	Not Detected	---------	2.78E-02
RU-106	Not Detected	---------	2.70E-01
SB-122	Not Detected	---------	7.44E-02
SB-124	Not Detected	---------	2.79E-02
SB-125	Not Detected	---------	7.67E-02
SN-113	Not Detected	---------	3.57E-02
SR-85	Not Detected	---------	3.65E-02
TA-182	Not Detected	---------	1.36E-01
TA-183	Not Detected	---------	5.65E-01
TC-99m	Not Detected	---------	6.23E+01
TL-201	Not Detected	---------	3.31E-01
XE-133	Not Detected	---------	3.28E-01
Y-88	Not Detected	---------	2.55E-02
ZN-65	Not Detected	---------	9.11E-02
ZR-95	Not Detected	---------	5.28E-02

```
*************************************************************************
*                   Sandia National Laboratories                        *
*   Radiation Protection Sample Diagnostics Program [881 Laboratory]   *
*                     10-23-97  7:50:31 AM                              *
*************************************************************************
*                                                                       *
* Analyzed by: [signature] 10/23/97    Reviewed by: [signature] 10/23/97 *
*************************************************************************
```

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036228-002
Lab Sample ID : 70182414

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 704.000 gram
Sample Date/Time : 10-16-97 10:17:00 AM
Acquire Start Date/Time : 10-19-97 10:03:36 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	3.43E+00
TH-234	1.10E+00	4.31E-01	6.56E-01
RA-226	1.73E+00	8.88E-01	5.41E-01
PB-214	6.41E-01	4.95E-01	4.91E-02
BI-214	5.98E-01	1.12E-01	4.91E-02
PB-210	Not Detected	---------	3.56E+01
TH-232	8.64E-01	4.13E-01	1.64E-01
RA-228	7.74E-01	2.12E-01	1.49E-01
AC-228	7.88E-01	2.05E-01	1.01E-01
TH-228	9.96E-01	3.15E-01	4.98E-01
RA-224	8.99E-01	2.97E-01	7.68E-02
PB-212	8.59E-01	1.47E-01	4.50E-02
BI-212	1.09E+00	5.17E-01	3.78E-01
TL-208	8.35E-01	1.78E-01	7.02E-02
U-235	Not Detected	---------	2.58E-01
TH-231	Not Detected	---------	1.36E+01
PA-231	Not Detected	---------	1.50E+00
TH-227	Not Detected	---------	3.70E-01
RA-223	Not Detected	---------	2.54E-01
RN-219	Not Detected	---------	4.05E-01
PB-211	Not Detected	---------	9.03E-01
TL-207	Not Detected	---------	1.44E+01
AM-241	Not Detected	---------	5.02E-01
PU-239	Not Detected	---------	4.65E+02
NP-237	~~5.58E-01~~	~~1.96E-01~~	3.24E-01 not detected [signature] 10/23/97
PA-233	Not Detected	---------	6.30E-02
TH-229	Not Detected	---------	2.73E-01

[Summary Report] - Sample ID: : 70182414

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.18E-02
AG-110m	Not Detected	---	5.21E-02
BA-133	Not Detected	---	6.85E-02
BE-7	Not Detected	---	2.86E-01
CD-109	Not Detected	---	1.10E+00
CD-115	Not Detected	---	1.83E-01
CE-139	Not Detected	---	3.11E-02
CE-141	Not Detected	---	5.94E-02
CE-144	Not Detected	---	2.59E-01
CO-56	Not Detected	---	3.66E-02
CO-57	Not Detected	---	3.20E-02
CO-58	Not Detected	---	3.31E-02
CO-60	Not Detected	---	3.72E-02
CR-51	Not Detected	---	2.68E-01
CS-134	Not Detected	---	4.70E-02
CS-137	2.35E-01	4.98E-02	2.57E-02
EU-152	Not Detected	---	9.59E-02
EU-154	Not Detected	---	1.93E-01
EU-155	Not Detected	---	1.59E-01
FE-59	Not Detected	---	7.95E-02
GD-153	Not Detected	---	1.14E-01
HG-203	Not Detected	---	3.39E-02
I-131	Not Detected	---	3.79E-02
IR-192	Not Detected	---	3.04E-02
K-40	1.93E+01	2.81E+00	4.41E-01
MN-52	Not Detected	---	4.42E-02
MN-54	Not Detected	---	3.72E-02
MO-99	Not Detected	---	5.35E-01
NA-22	Not Detected	---	4.35E-02
NA-24	Not Detected	---	8.81E-01
NB-95	Not Detected	---	3.04E-01
ND-147	Not Detected	---	2.57E-01
NI-57	Not Detected	---	9.08E-02
RU-103	Not Detected	---	3.23E-02
RU-106	Not Detected	---	3.00E-01
SB-122	Not Detected	---	8.86E-02
SB-124	Not Detected	---	3.19E-02
SB-125	Not Detected	---	9.17E-02
SN-113	Not Detected	---	3.89E-02
SR-85	Not Detected	---	4.05E-02
TA-182	Not Detected	---	1.55E-01
TA-183	Not Detected	---	6.48E-01
TC-99m	Not Detected	---	1.32E+02
TL-201	Not Detected	---	3.80E-01
XE-133	Not Detected	---	3.97E-01
Y-88	Not Detected	---	2.91E-02
ZN-65	Not Detected	---	1.05E-01
ZR-95	Not Detected	---	6.38E-02

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

10-23-97 8:11:19 AM

* Analyzed by: 10/23/97 Reviewed by: 10/23/97

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036229-002
Lab Sample ID : 70182415

Sample Description : MARINELLI LIQUID SAMPLE
Sample Quantity : 500.000 mL
Sample Date/Time : 10-16-97 2:10:00 PM
Acquire Start Date/Time : 10-19-97 11:48:47 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6001 seconds

Comments:

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Nuclide Name	Activity (pCi/mL)	2-sigma Error	MDA (pCi/mL)
U-238	Not Detected	---	1.68E+00
TH-234	Not Detected	---	4.03E-01
RA-226	Not Detected	---	4.66E-01
PB-214	Not Detected	---	4.80E-02
BI-214	Not Detected	---	5.77E-02
PB-210	Not Detected	---	1.44E+01
TH-232	Not Detected	---	1.41E-01
RA-228	Not Detected	---	1.44E-01
AC-228	Not Detected	---	7.46E-02
TH-228	Not Detected	---	5.13E-01
RA-224	Not Detected	---	1.12E-01
PB-212	Not Detected	---	3.66E-02
BI-212	Not Detected	---	3.19E-01
TL-208	Not Detected	---	6.44E-02
U-235	Not Detected	---	1.59E-01
TH-231	Not Detected	---	6.37E+00
PA-231	Not Detected	---	9.72E-01
TH-227	Not Detected	---	1.41E-01
RA-223	Not Detected	---	1.15E-01
RN-219	Not Detected	---	2.71E-01
PB-211	Not Detected	---	6.08E-01
TL-207	Not Detected	---	9.70E+00
AM-241	Not Detected	---	2.36E-01
PU-239	Not Detected	---	2.72E+02
NP-237	Not Detected	---	1.86E-01
PA-233	Not Detected	---	4.16E-02
TH-229	Not Detected	---	1.45E-01

[Summary Report] - Sample ID: : 70182415

Nuclide Name	Activity (pCi/mL)	2-sigma Error	MDA (pCi/mL)
AG-108m	Not Detected	---	2.47E-02
AG-110m	Not Detected	---	2.29E-02
BA-133	Not Detected	---	3.05E-02
BE-7	Not Detected	---	1.94E-01
CD-109	Not Detected	---	6.28E-01
CD-115	Not Detected	---	8.76E-02
CE-139	Not Detected	---	1.96E-02
CE-141	Not Detected	---	3.66E-02
CE-144	Not Detected	---	1.54E-01
CO-56	Not Detected	---	2.95E-02
CO-57	Not Detected	---	1.90E-02
CO-58	Not Detected	---	2.32E-02
CO-60	Not Detected	---	2.50E-02
CR-51	Not Detected	---	1.77E-01
CS-134	Not Detected	---	2.51E-02
CS-137	Not Detected	---	2.33E-02
EU-152	Not Detected	---	5.70E-02
EU-154	Not Detected	---	1.11E-01
EU-155	Not Detected	---	9.03E-02
FE-59	Not Detected	---	4.59E-02
GD-153	Not Detected	---	6.11E-02
HG-203	Not Detected	---	2.24E-02
I-131	Not Detected	---	2.65E-02
IR-192	Not Detected	---	1.99E-02
K-40	Not Detected	---	3.42E-01
MN-52	Not Detected	---	3.56E-02
MN-54	Not Detected	---	2.28E-02
MO-99	Not Detected	---	3.73E-01
NA-22	Not Detected	---	2.39E-02
NA-24	Not Detected	---	6.14E-01
NB-95	Not Detected	---	1.14E-01
ND-147	Not Detected	---	1.56E-01
NI-57	Not Detected	---	1.26E-01
RU-103	Not Detected	---	2.37E-02
RU-106	Not Detected	---	2.11E-01
SB-122	Not Detected	---	6.47E-02
SB-124	Not Detected	---	2.38E-02
SB-125	Not Detected	---	5.97E-02
SN-113	Not Detected	---	2.73E-02
SR-85	Not Detected	---	3.23E-02
TA-182	Not Detected	---	7.71E-02
TA-183	Not Detected	---	3.03E-01
TC-99m	Not Detected	---	6.82E+01
TL-201	Not Detected	---	1.83E-01
XE-133	Not Detected	---	1.79E-01
Y-88	Not Detected	---	3.12E-02
ZN-65	Not Detected	---	5.01E-02
ZR-95	Not Detected	---	4.07E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-23-97 8:22:15 AM *
****
*
* Analyzed by: 10/23/97 Reviewed by: 10/23/97 *
****

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : 036230-002
Lab Sample ID : 70182416

Sample Description : MARINELLI LIQUID SAMPLE
Sample Quantity : 400.000 mL
Sample Date/Time : 10-16-97 2:20:00 PM
Acquire Start Date/Time : 10-19-97 1:34:44 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6001 seconds

Comments:

Nuclide Name	Activity (pCi/mL)	2-sigma Error	MDA (pCi/mL)
U-238	Not Detected	---	2.15E+00
TH-234	Not Detected	---	4.75E-01
RA-226	Not Detected	---	5.99E-01
PB-214	Not Detected	---	6.49E-02
BI-214	Not Detected	---	6.51E-02
PB-210	Not Detected	---	1.79E+01
TH-232	Not Detected	---	1.75E-01
RA-228	Not Detected	---	1.79E-01
AC-228	Not Detected	---	9.53E-02
TH-228	Not Detected	---	6.06E-01
RA-224	Not Detected	---	1.40E-01
PB-212	Not Detected	---	4.48E-02
BI-212	Not Detected	---	4.00E-01
TL-208	Not Detected	---	8.12E-02
U-235	Not Detected	---	1.82E-01
TH-231	Not Detected	---	7.77E+00
PA-231	Not Detected	---	1.28E+00
TH-227	Not Detected	---	1.70E-01
RA-223	Not Detected	---	1.38E-01
RN-219	Not Detected	---	3.37E-01
PB-211	Not Detected	---	7.44E-01
TL-207	Not Detected	---	1.08E+01
AM-241	Not Detected	---	3.16E-01
PU-239	Not Detected	---	3.50E+02
NP-237	Not Detected	---	2.12E-01
PA-233	Not Detected	---	5.50E-02
TH-229	Not Detected	---	1.93E-01

[Summary Report] - Sample ID: : 70182416

Nuclide Name	Activity (pCi/mL)	2-sigma Error	MDA (pCi/mL)
AG-108m	Not Detected	---------	2.96E-02
AG-110m	Not Detected	---------	2.89E-02
BA-133	Not Detected	---------	3.88E-02
BE-7	Not Detected	---------	2.46E-01
CD-109	Not Detected	---------	6.84E-01
CD-115	Not Detected	---------	1.10E-01
CE-139	Not Detected	---------	2.49E-02
CE-141	Not Detected	---------	4.12E-02
CE-144	Not Detected	---------	1.98E-01
CO-56	Not Detected	---------	3.79E-02
CO-57	Not Detected	---------	2.43E-02
CO-58	Not Detected	---------	2.88E-02
CO-60	Not Detected	---------	3.15E-02
CR-51	Not Detected	---------	2.29E-01
CS-134	Not Detected	---------	3.06E-02
CS-137	Not Detected	---------	2.93E-02
EU-152	Not Detected	---------	7.28E-02
EU-154	Not Detected	---------	1.38E-01
EU-155	Not Detected	---------	1.11E-01
FE-59	Not Detected	---------	5.66E-02
GD-153	Not Detected	---------	7.73E-02
HG-203	Not Detected	---------	2.61E-02
I-131	Not Detected	---------	3.31E-02
IR-192	Not Detected	---------	2.64E-02
K-40	Not Detected	---------	4.10E-01
MN-52	Not Detected	---------	4.67E-02
MN-54	Not Detected	---------	3.03E-02
MO-99	Not Detected	---------	4.16E-01
NA-22	Not Detected	---------	3.13E-02
NA-24	Not Detected	---------	8.08E-01
NB-95	Not Detected	---------	1.39E-01
ND-147	Not Detected	---------	2.05E-01
NI-57	Not Detected	---------	1.51E-01
RU-103	Not Detected	---------	3.03E-02
RU-106	Not Detected	---------	3.03E-01
SB-122	Not Detected	---------	8.04E-02
SB-124	Not Detected	---------	3.15E-02
SB-125	Not Detected	---------	7.07E-02
SN-113	Not Detected	---------	3.36E-02
SR-85	Not Detected	---------	4.02E-02
TA-182	Not Detected	---------	9.21E-02
TA-183	Not Detected	---------	4.14E-01
TC-99m	~~3.14E+01~~	~~4.21E+01~~	6.29E+01
TL-201	Not Detected	---------	2.32E-01
XE-133	Not Detected	---------	2.22E-01
Y-88	Not Detected	---------	3.48E-02
ZN-65	Not Detected	---------	6.68E-02
ZR-95	Not Detected	---------	4.96E-02

Not detected 10/23/97

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 10-19-97 3:32:00 PM *
****
*
* Analyzed by: 10/23/97 Reviewed by: 10/23/97 *
****

Customer : C.BYRD/D.BISWELL (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 70182417

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 10-19-97 3:19:28 PM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.16E+04
TH-234	Not Detected	---	4.71E+03
RA-226	Not Detected	---	6.47E+03
PB-214	Not Detected	---	7.23E+02
BI-214	Not Detected	---	6.45E+02
PB-210	Not Detected	---	2.65E+05
TH-232	Not Detected	---	2.27E+03
RA-228	Not Detected	---	2.69E+03
AC-228	Not Detected	---	1.55E+03
TH-228	Not Detected	---	8.93E+04
RA-224	Not Detected	---	3.99E+03
PB-212	Not Detected	---	6.42E+03
BI-212	Not Detected	---	5.56E+04
TL-208	Not Detected	---	1.20E+04
U-235	Not Detected	---	1.83E+03
TH-231	Not Detected	---	8.24E+04
PA-231	Not Detected	---	1.50E+04
TH-227	Not Detected	---	2.49E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.86E+03
PB-211	Not Detected	---	1.32E+04
TL-207	Not Detected	---	2.26E+05
AM-241	7.97E+04	1.42E+04	3.14E+03
PU-239	Not Detected	---	3.34E+06
NP-237	Not Detected	---	2.45E+03
PA-233	Not Detected	---	6.29E+02
TH-229	Not Detected	---	1.74E+03

[Summary Report] - Sample ID: : 70182417

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.38E+02
AG-110m	Not Detected	---------	1.95E+06
BA-133	Not Detected	---------	7.19E+02
BE-7	Not Detected	---------	8.47E+17
CD-109	3.78E+05	3.87E+05	3.18E+05
CD-115	Not Detected	---------	1.00E+26
CE-139	Not Detected	---------	8.64E+07
CE-141	Not Detected	---------	1.00E+26
CE-144	Not Detected	---------	9.08E+05
CO-56	Not Detected	---------	3.24E+12
CO-57	Not Detected	---------	1.50E+05
CO-58	Not Detected	---------	2.23E+13
CO-60	8.10E+04	1.10E+04	3.73E+02
CR-51	Not Detected	---------	1.00E+26
CS-134	Not Detected	---------	3.08E+03
CS-137	7.18E+04	1.21E+04	2.76E+02
EU-152	Not Detected	---------	9.86E+02
EU-154	Not Detected	---------	2.64E+03
EU-155	Not Detected	---------	2.98E+03
FE-59	Not Detected	---------	1.36E+20
GD-153	Not Detected	---------	1.07E+06
HG-203	Not Detected	---------	8.32E+18
I-131	Not Detected	---------	1.00E+26
IR-192	Not Detected	---------	7.11E+12
K-40	Not Detected	---------	1.67E+03
MN-52	Not Detected	---------	1.00E+26
MN-54	Not Detected	---------	5.36E+04
MO-99	Not Detected	---------	1.00E+26
NA-22	Not Detected	---------	1.41E+03
NA-24	Not Detected	---------	1.00E+26
NB-95	Not Detected	---------	1.00E+26
ND-147	Not Detected	---------	1.00E+26
NI-57	Not Detected	---------	1.00E+26
RU-103	Not Detected	---------	1.18E+22
RU-106	Not Detected	---------	3.81E+05
SB-122	Not Detected	---------	1.00E+26
SB-124	Not Detected	---------	1.57E+15
SB-125	Not Detected	---------	6.49E+03
SN-113	Not Detected	---------	2.04E+09
SR-85	Not Detected	---------	2.43E+14
TA-182	Not Detected	---------	5.45E+09
TA-183	Not Detected	---------	1.00E+26
TC-99m	Not Detected	---------	1.00E+26
TL-201	Not Detected	---------	1.00E+26
XE-133	Not Detected	---------	1.00E+26
Y-88	Not Detected	---------	2.61E+09
ZN-65	Not Detected	---------	1.26E+06
ZR-95	Not Detected	---------	5.18E+14

Feature 58U

MINIMUM INTERVAL

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 2

Internal Lab Batch No. 600216

ER Site 58 DRT Foothills Test Area

AR/COC- 04954

SF 2001-COC (6-95)

Dept. No./Mail Stop: 7585/1148 MS
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No: 0155
Service Order No.: CF0180

Date Samples Shipped: 3/15/96 SIMONITE
Carrier/Waybill No.: HC
Lab Contact: AMIR MOHAGHEGHI
Lab Destination: AMIR (844-6910)
SMO Contact/Phone: Doug Salmi (848-0963)
Send Report to SMO

Contract No.:
Case No.: 88325.1110
SMO Authorization:
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec

Location Tech Area III
Building Room

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
027975-02	58DRT-GR-001-0.0-SS	0.0	58	3-14-96 1326	Soil	Poly	500ml	4°c	G	SA	
027976-02	58DRT-GR-002-0.0-SS	0.0	58	1330	Soil	Poly	500ml	4°c	G	SA	
027977-02	58DRT-GR-003-0.0-SS	0.0	58	1332	Soil	Poly	500ml	4°c	G	SA	
027980-02	58DRT-GR-005-0.0-SS	0.0	58	1348	Soil	Poly	500ml	4°c	G	SA	
027981-02	58DRT-GR-006-0.0-SS	0.0	58	1351	Soil	Poly	500ml	4°c	G	SA	
027982-02	58DRT-GR-007-0.0-SS	0.0	58	1354	Soil	Poly	500ml	4°c	G	SA	
027985-02	58DRT-GR-009-0.0-SS	0.0	58	1415	Soil	Poly	500ml	4°c	G	SA	
027986-02	58DRT-GR-010-0.0-SS	0.0	58	1418	Soil	Poly	500ml	4°c	G	SA	
027987-02	58DRT-GR-011-0.0-SS	0.0	58	1420	Soil	Poly	500ml	4°c	G	SA	
027990-02	58DRT-GR-013-0.0-SS	0.0	58	1448	Soil	Poly	500ml	4°c	G	SA	

RMMA ☑ Yes ☐ No Ref. No.

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☑ Normal ☐ Rush Required Report Date

Sample Tracking
Date Entered (mm/dd/yy)
Entered by:
QC Initials:

Special Instructions/QC Requirements
Please send report to Mike Young.

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciato	Concetta Cacciato	CC	Lamb/7584/284-3301
	Rod Nagel	Rod Nagel	RN	I.T./7584
	Jim Calvert	Jim Calvert	JC	Lamb/7584/284-3301

1. Relinquished by	Jim Calvert	Org. 7584	Date 3-15-96	Time 0940	4. Relinquished by	Org.	Date Time
1. Received by		Org. SNL7713	Date 3/15/96	Time 0940	4. Received by	Org.	Date Time
2. Relinquished by		Org. SNL7713	Date 4/5/96	Time 0800	5. Relinquished by	Org.	Date Time
2. Received by	Concetta Cacciato	Org. 7584	Date 4/5/96	Time 08:00	5. Received by	Org.	Date Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

HITTING IN-HOUSE

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

AR/COC- 04954

BATCH #600216

ER Site 58 DRT Foothills Test Area

Project Name: Foothills Test Area Project/Task Manager: Mike Young Case No.: 8835.110

Location Tech Area III

Building _____ Room _____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: Gamma Spec	Lab Sample ID
027991-02	58DRT-GR-014-0.0-SS	0.0	DRT 58	3-14-96 1455	Soil	Poly	500ml	4°C	G	SA	X	
027992-02	58DRT-GR-015-0.0-SS	0.0	58	1500	Soil	Poly	500ml	4°C	G	SA	X	
027994-02	58DRT-GR-016-0.0-SS	0.0	58	1510	Soil	Poly	500ml	4°C	G	DU	X	
027997-02	58DRT-GR-017-0.0-SS	0.0	58	1505	Soil	Poly	500ml	4°C	G	SA	X	
027998-12	58DRT-GR-018-0.0-EB	0.0	58	1530	Water	Poly	500ml	4°C	G	EB	X	

Abnormal Conditions on Receipt

Recipient Initials _____

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

****
*
Sandia National Laboratories
*
Radiation Protection Sample Diagnostics Program [881 Laboratory]
*
3-28-96 1:51:54 AM
*
****
*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027981-02
Lab Sample ID : 60021605

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 716.000 gram
Sample Date/Time : 3-14-96 1:51:00 PM
Acquire Start Date : 3-28-96 12:08:59 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.73
TH-234	1.59	6.19E-01	7.00E-01
RA-226	2.21	9.25E-01	1.36
PB-214	7.48E-01	1.29E-01	9.76E-02
BI-214	7.38E-01	1.20E-01	6.74E-02
TH-232	9.96E-01	4.62E-01	1.92E-01
RA-228	1.05	2.24E-01	1.40E-01
AC-228	1.09	1.96E-01	1.12E-01
TH-228	1.02	3.26E-01	5.36E-01
RA-224	1.05	2.59E-01	6.91E-02
PB-212	1.04	1.72E-01	4.30E-02
BI-212	1.21	3.21E-01	3.62E-01
TL-208	9.67E-01	1.55E-01	9.20E-02
U-235	Not Detected	--------	2.65E-01
TH-231	Not Detected	--------	3.03
PA-231	Not Detected	--------	1.63
TH-227	Not Detected	--------	4.09E-01
RA-223	Not Detected	--------	4.55E-01
RN-219	Not Detected	--------	4.53E-01
PB-211	Not Detected	--------	1.05
TL-207	Not Detected	--------	1.38E+01
AM-241	Not Detected	--------	6.11E-01
PU-239	Not Detected	--------	4.11E+02
NP-237	Not Detected	--------	3.40E-01
PA-233	Not Detected	--------	6.67E-02
TH-229	Not Detected	--------	3.12E-01

[Summary Report] - Sample ID: 60021605

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.30E-02
AG-110m	Not Detected	--------	9.66E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.82E-02
BA-140	Not Detected	--------	2.39E-01
CD-109	Not Detected	--------	1.19
CD-115	Not Detected	--------	4.86
CE-139	Not Detected	--------	3.48E-02
CE-141	Not Detected	--------	7.90E-02
CE-144	Not Detected	--------	2.76E-01
CO-56	Not Detected	--------	4.12E-02
CO-57	Not Detected	--------	3.59E-02
CO-58	Not Detected	--------	3.57E-02
CO-60	Not Detected	--------	3.81E-02
CR-51	Not Detected	--------	3.59E-01
CS-134	Not Detected	--------	5.44E-02
CS-137	1.34	1.81E-01	5.48E-02
CU-64	Not Detected	--------	3.50E+08
EU-152	Not Detected	--------	9.98E-02
EU-154	Not Detected	--------	1.95E-01
EU-155	Not Detected	--------	1.52E-01
FE-59	Not Detected	--------	8.90E-02
GD-153	Not Detected	--------	1.29E-01
HG-203	Not Detected	--------	3.95E-02
I-131	Not Detected	--------	1.01E-01
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.57E-02
K-40	1.80E+01	2.42	2.54E-01
LA-140	Not Detected	--------	9.01
MN-54	Not Detected	--------	3.64E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	7.97
NA-22	Not Detected	--------	4.05E-02
NA-24	Not Detected	--------	1.02E+05
NB-95	Not Detected	--------	2.51
ND-147	Not Detected	--------	5.07E-01
NI-57	Not Detected	--------	2.43E+01
BE-07	Not Detected	--------	3.57E-01
RU-103	Not Detected	--------	4.07E-02
RU-106	Not Detected	--------	3.10E-01
SB-122	Not Detected	--------	1.38
SB-124	Not Detected	--------	3.90E-02
SB-125	Not Detected	--------	1.02E-01
SC-46	Not Detected	--------	5.87E-02
SR-85	Not Detected	--------	4.69E-02
TA-182	Not Detected	--------	1.65E-01
TA-183	Not Detected	--------	3.26
TE-132	Not Detected	--------	5.43E-01
TL-201	Not Detected	--------	3.78
V-48	Not Detected	--------	6.06E-02
XE-133	Not Detected	--------	9.64
Y-88	Not Detected	--------	2.87E-02
ZN-65	Not Detected	--------	1.09E-01
ZR-95	Not Detected	--------	6.99E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics AMIR-IN-HOUSE

Sample Analysis Request Form
Page 1 of 2

To be completed by Customer ER Site 58 DRT

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 7585/1148ms
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed:
Suspect Isotopes:
Other Information: 04954

Hazards/Special Instructions:
- Please send report to Mike Young (1148ms)
- C.C. will pick-up samples.

Batch Log Number: 606216
Logged By: Jim

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

	Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
1	027975-02	Soil	3-14-96 1326	500ml	Gamma Spec.	01	<300	782	
2	027976-02	Soil	1330	500ml	" "	02		739	
3	027977-02	Soil	1332	500ml	" "	03		756	
5	027980-02	Soil	1348	500ml	" "	04	MDL	644	
6	027981-02	Soil	1351	500ml	" "	05		716	
7	027982-02	Soil	1354	500ml	" "	06		657	
7	027985-02	Soil	1415	500ml	" "	07		549	
9	027986-02	Soil	1418	500ml	" "	08		590	
11	027987-02	Soil	1420	500ml	" "	09	529 MDL	539	
13	027990-02	Soil	1448	500ml	" "	10		873	
14	027991-02	Soil	1455	500ml	" "	11		824	
15	027992-02	Soil	1500	500ml	" "	12	730 MDL	730	
16 17	027994-02	Soil/DW	1510	500ml	" "	13	616 MDL	616	
18 19	027998-02	~~Water~~ Soil	1565	500ml	" "	14		634	

Relinquished by Jim Calvert Date 3-15-96 Time 0940 Received by _____ Date 3/15/96 Time 0940
Relinquished by _____ Date 4/5/96 Time 0800 Received by _____ Date 4/5/96 Time 0800
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics ER Site 58DRT

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer This goes with COC # 04954

Shaded areas are for RPSD use only

Customer : Mike Young
Organization: 7585/1148ms
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: _____
Suspect Isotopes: _____
Other Information: 04954

Hazards/Special Instructions:

Batch Log Number: 600216
Logged By: Jm

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login _____
Results Faxed _____
Sample Disposal _____

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
18 027998-12	Water	3-19-96 1530	500ml	Gamma Spec	15	<300	500ml	
LCS	—	1 NOV 90	—	8 Spec	16	NA	NA	

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-27-96 6:43:07 PM *
****
*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027975-02
Lab Sample ID : 60021601

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 782.000 gram
Sample Date/Time : 3-14-96 1:26:00 PM
Acquire Start Date : 3-27-96 5:00:17 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.26
TH-234	Not Detected	--------	7.60E-01
RA-226	1.31	5.97E-01	8.83E-01
PB-214	6.32E-01	1.08E-01	7.90E-02
BI-214	6.07E-01	1.02E-01	6.34E-02
TH-232	7.25E-01	3.36E-01	1.34E-01
RA-228	8.98E-01	2.66E-01	1.43E-01
AC-228	8.90E-01	1.67E-01	1.11E-01
TH-228	7.30E-01	2.33E-01	4.79E-01
RA-224	8.44E-01	2.14E-01	9.06E-02
PB-212	7.98E-01	1.34E-01	3.65E-02
BI-212	1.13	3.50E-01	4.48E-01
TL-208	7.66E-01	1.25E-01	7.69E-02
U-235	Not Detected	--------	2.26E-01
TH-231	Not Detected	--------	2.58
PA-231	Not Detected	--------	1.42
TH-227	Not Detected	--------	3.49E-01
RA-223	Not Detected	--------	3.83E-01
RN-219	Not Detected	--------	3.73E-01
PB-211	Not Detected	--------	8.85E-01
TL-207	Not Detected	--------	1.30E+01
AM-241	Not Detected	--------	5.27E-01
PU-239	Not Detected	--------	2.54E+02
NP-237	Not Detected	--------	3.70E-01
PA-233	Not Detected	--------	5.69E-02
TH-229	Not Detected	--------	2.73E-01

[Summary Report] - Sample ID: 60021601

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.79E-02
AG-110m	Not Detected	--------	6.62E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.75E-02
BA-140	Not Detected	--------	1.97E-01
CD-109	Not Detected	--------	8.63E-01
CD-115	Not Detected	--------	3.73
CE-139	Not Detected	--------	3.03E-02
CE-141	Not Detected	--------	6.79E-02
CE-144	Not Detected	--------	2.36E-01
CO-56	Not Detected	--------	3.51E-02
CO-57	Not Detected	--------	3.17E-02
CO-58	Not Detected	--------	3.24E-02
CO-60	Not Detected	--------	3.23E-02
CR-51	Not Detected	--------	3.15E-01
CS-134	Not Detected	--------	4.66E-02
CS-137	5.80E-01	8.23E-02	3.08E-02
CU-64	Not Detected	--------	2.09E+08
EU-152	Not Detected	--------	8.38E-02
EU-154	Not Detected	--------	1.70E-01
EU-155	Not Detected	--------	1.32E-01
FE-59	Not Detected	--------	7.90E-02
GD-153	Not Detected	--------	1.14E-01
HG-203	Not Detected	--------	3.41E-02
I-131	Not Detected	--------	8.71E-02
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.05E-02
K-40	1.84E+01	2.50	3.11E-01
LA-140	Not Detected	--------	7.23
MN-54	Not Detected	--------	2.44E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	6.57
NA-22	Not Detected	--------	3.87E-02
NA-24	Not Detected	--------	6.98E+04
NB-95	Not Detected	--------	2.03
ND-147	Not Detected	--------	4.17E-01
NI-57	Not Detected	--------	2.06E+01
BE-07	Not Detected	--------	2.91E-01
RU-103	Not Detected	--------	3.30E-02
RU-106	Not Detected	--------	2.70E-01
SB-122	Not Detected	--------	1.11
SB-124	Not Detected	--------	3.36E-02
SB-125	Not Detected	--------	8.46E-02
SC-46	Not Detected	--------	5.27E-02
SR-85	Not Detected	--------	4.09E-02
TA-182	Not Detected	--------	1.50E-01
TA-183	Not Detected	--------	2.71
TE-132	Not Detected	--------	4.45E-01
TL-201	Not Detected	--------	3.06
V-48	Not Detected	--------	5.64E-02
XE-133	Not Detected	--------	7.51
Y-88	Not Detected	--------	2.72E-02
ZN-65	Not Detected	--------	9.68E-02
ZR-95	Not Detected	--------	6.07E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-27-96 8:30:26 PM *
****
*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027976-02
Lab Sample ID : 60021602

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 739.000 gram
Sample Date/Time : 3-14-96 1:30:00 PM
Acquire Start Date : 3-27-96 6:47:33 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.51
TH-234	1.13	3.79E-01	5.87E-01
RA-226	1.82	5.31E-01	6.88E-01
PB-214	7.71E-01	1.26E-01	7.77E-02
BI-214	7.08E-01	1.17E-01	7.11E-02
TH-232	8.93E-01	4.31E-01	2.60E-01
RA-228	1.05	2.37E-01	1.34E-01
AC-228	9.45E-01	1.73E-01	1.01E-01
TH-228	9.28E-01	2.67E-01	4.72E-01
RA-224	1.02	2.50E-01	7.34E-02
PB-212	9.65E-01	1.54E-01	4.23E-02
BI-212	1.23	3.26E-01	3.70E-01
TL-208	9.44E-01	1.54E-01	1.03E-01
U-235	Not Detected	--------	2.51E-01
TH-231	Not Detected	--------	2.93
PA-231	Not Detected	--------	1.60
TH-227	Not Detected	--------	3.91E-01
RA-223	Not Detected	--------	4.28E-01
RN-219	Not Detected	--------	4.34E-01
PB-211	Not Detected	--------	1.01
TL-207	Not Detected	--------	1.38E+01
AM-241	Not Detected	--------	5.76E-01
PU-239	Not Detected	--------	4.94E+02
NP-237	Not Detected	--------	2.96E-01
PA-233	Not Detected	--------	6.60E-02
TH-229	Not Detected	--------	3.07E-01

[Summary Report] - Sample ID: 60021602

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.21E-02
AG-110m	Not Detected	--------	9.48E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.53E-02
BA-140	Not Detected	--------	2.32E-01
CD-109	Not Detected	--------	1.04
CD-115	Not Detected	--------	4.36
CE-139	Not Detected	--------	3.32E-02
CE-141	Not Detected	--------	7.51E-02
CE-144	Not Detected	--------	2.64E-01
CO-56	Not Detected	--------	3.82E-02
CO-57	Not Detected	--------	3.42E-02
CO-58	Not Detected	--------	3.43E-02
CO-60	Not Detected	--------	3.77E-02
CR-51	Not Detected	--------	3.58E-01
CS-134	Not Detected	--------	5.22E-02
CS-137	1.27	1.71E-01	3.73E-02
CU-64	Not Detected	--------	2.58E+08
EU-152	Not Detected	--------	9.83E-02
EU-154	Not Detected	--------	1.90E-01
EU-155	Not Detected	--------	1.49E-01
FE-59	Not Detected	--------	8.38E-02
GD-153	Not Detected	--------	1.23E-01
HG-203	Not Detected	--------	4.12E-02
I-131	Not Detected	--------	9.59E-02
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.44E-02
K-40	1.80E+01	2.45	3.07E-01
LA-140	Not Detected	--------	8.76
MN-54	Not Detected	--------	3.50E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	7.29
NA-22	Not Detected	--------	4.26E-02
NA-24	Not Detected	--------	8.09E+04
NB-95	Not Detected	--------	2.30
ND-147	Not Detected	--------	4.71E-01
NI-57	Not Detected	--------	2.25E+01
BE-07	Not Detected	--------	3.57E-01
RU-103	Not Detected	--------	3.85E-02
RU-106	Not Detected	--------	2.97E-01
SB-122	Not Detected	--------	1.32
SB-124	Not Detected	--------	3.78E-02
SB-125	Not Detected	--------	9.80E-02
SC-46	Not Detected	--------	5.74E-02
SR-85	Not Detected	--------	4.45E-02
TA-182	Not Detected	--------	1.67E-01
TA-183	Not Detected	--------	3.03
TE-132	Not Detected	--------	5.08E-01
TL-201	Not Detected	--------	3.40
V-48	Not Detected	--------	5.76E-02
XE-133	Not Detected	--------	8.72
Y-88	Not Detected	--------	2.75E-02
ZN-65	Not Detected	--------	1.08E-01
ZR-95	Not Detected	--------	6.57E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-27-96 10:17:23 PM *
****
*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027977-02
Lab Sample ID : 60021603

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 756.000 gram
Sample Date/Time : 3-14-96 1:32:00 PM
Acquire Start Date : 3-27-96 8:34:38 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.32
TH-234	1.09	3.69E-01	5.42E-01
RA-226	1.53	4.84E-01	6.46E-01
PB-214	6.40E-01	1.07E-01	7.17E-02
BI-214	6.03E-01	1.02E-01	6.68E-02
TH-232	9.43E-01	4.45E-01	2.24E-01
RA-228	9.51E-01	2.12E-01	1.39E-01
AC-228	8.86E-01	1.65E-01	1.06E-01
TH-228	8.38E-01	2.49E-01	4.65E-01
RA-224	9.00E-01	2.24E-01	6.95E-02
PB-212	8.71E-01	1.45E-01	3.76E-02
BI-212	1.03	3.18E-01	4.00E-01
TL-208	8.47E-01	1.39E-01	9.01E-02
U-235	Not Detected	--------	2.37E-01
TH-231	Not Detected	--------	2.80
PA-231	Not Detected	--------	1.49
TH-227	Not Detected	--------	3.67E-01
RA-223	Not Detected	--------	4.05E-01
RN-219	Not Detected	--------	4.05E-01
PB-211	Not Detected	--------	9.47E-01
TL-207	Not Detected	--------	1.33E+01
AM-241	Not Detected	--------	5.49E-01
PU-239	Not Detected	--------	4.70E+02
NP-237	Not Detected	--------	2.56E-01
PA-233	Not Detected	--------	6.02E-02
TH-229	Not Detected	--------	2.95E-01

[Summary Report] - Sample ID: 60021603

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.83E-02
AG-110m	Not Detected	--------	7.76E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.13E-02
BA-140	Not Detected	--------	2.27E-01
CD-109	Not Detected	--------	8.98E-01
CD-115	Not Detected	--------	4.19
CE-139	Not Detected	--------	3.26E-02
CE-141	Not Detected	--------	7.07E-02
CE-144	Not Detected	--------	2.50E-01
CO-56	Not Detected	--------	3.71E-02
CO-57	Not Detected	--------	3.37E-02
CO-58	Not Detected	--------	3.30E-02
CO-60	Not Detected	--------	3.54E-02
CR-51	Not Detected	--------	3.29E-01
CS-134	Not Detected	--------	4.87E-02
CS-137	8.28E-01	1.15E-01	3.81E-02
CU-64	Not Detected	--------	2.66E+08
EU-152	Not Detected	--------	9.04E-02
EU-154	Not Detected	--------	1.73E-01
EU-155	Not Detected	--------	1.42E-01
FE-59	Not Detected	--------	8.65E-02
GD-153	Not Detected	--------	1.18E-01
HG-203	Not Detected	--------	3.56E-02
I-131	Not Detected	--------	8.86E-02
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.26E-02
K-40	1.90E+01	2.58	2.59E-01
LA-140	Not Detected	--------	8.55
MN-54	Not Detected	--------	3.35E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	7.01
NA-22	Not Detected	--------	4.11E-02
NA-24	Not Detected	--------	8.47E+04
NB-95	Not Detected	--------	2.19
ND-147	Not Detected	--------	4.69E-01
NI-57	Not Detected	--------	2.36E+01
BE-07	Not Detected	--------	3.15E-01
RU-103	Not Detected	--------	3.68E-02
RU-106	Not Detected	--------	2.87E-01
SB-122	Not Detected	--------	1.19
SB-124	Not Detected	--------	3.59E-02
SB-125	Not Detected	--------	9.19E-02
SC-46	Not Detected	--------	5.69E-02
SR-85	Not Detected	--------	4.17E-02
TA-182	Not Detected	--------	1.61E-01
TA-183	Not Detected	--------	2.92
TE-132	Not Detected	--------	4.85E-01
TL-201	Not Detected	--------	3.28
V-48	Not Detected	--------	5.95E-02
XE-133	Not Detected	--------	8.57
Y-88	Not Detected	--------	2.54E-02
ZN-65	Not Detected	--------	1.02E-01
ZR-95	Not Detected	--------	6.51E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-28-96 12:04:34 AM *
****
*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027980-02
Lab Sample ID : 60021604

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 644.000 gram
Sample Date/Time : 3-14-96 1:48:00 PM
Acquire Start Date : 3-27-96 10:21:46 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.63
TH-234	1.26	4.30E-01	6.09E-01
RA-226	2.03	5.71E-01	7.24E-01
PB-214	6.55E-01	1.15E-01	8.97E-02
BI-214	6.48E-01	1.09E-01	6.51E-02
TH-232	7.96E-01	3.74E-01	1.70E-01
RA-228	8.56E-01	2.06E-01	1.51E-01
AC-228	7.99E-01	1.54E-01	9.99E-02
TH-228	8.09E-01	2.80E-01	5.78E-01
RA-224	9.32E-01	2.36E-01	8.28E-02
PB-212	8.36E-01	1.42E-01	4.10E-02
BI-212	8.77E-01	2.87E-01	3.58E-01
TL-208	8.07E-01	1.35E-01	8.65E-02
U-235	Not Detected	--------	2.56E-01
TH-231	Not Detected	--------	2.85
PA-231	Not Detected	--------	1.57
TH-227	Not Detected	--------	3.92E-01
RA-223	Not Detected	--------	4.18E-01
RN-219	Not Detected	--------	4.39E-01
PB-211	Not Detected	--------	1.02
TL-207	Not Detected	--------	1.45E+01
AM-241	Not Detected	--------	5.71E-01
PU-239	Not Detected	--------	4.19E+02
NP-237	Not Detected	--------	3.05E-01
PA-233	Not Detected	--------	6.11E-02
TH-229	Not Detected	--------	3.08E-01

[Summary Report] - Sample ID: 60021604

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.21E-02
AG-110m	Not Detected	--------	7.49E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.59E-02
BA-140	Not Detected	--------	2.33E-01
CD-109	Not Detected	--------	1.07
CD-115	Not Detected	--------	4.53
CE-139	Not Detected	--------	3.46E-02
CE-141	Not Detected	--------	7.68E-02
CE-144	Not Detected	--------	2.63E-01
CO-56	Not Detected	--------	4.19E-02
CO-57	Not Detected	--------	3.49E-02
CO-58	Not Detected	--------	3.67E-02
CO-60	Not Detected	--------	4.08E-02
CR-51	Not Detected	--------	3.33E-01
CS-134	Not Detected	--------	5.38E-02
CS-137	6.15E-01	8.90E-02	3.85E-02
CU-64	Not Detected	--------	3.25E+08
EU-152	Not Detected	--------	9.92E-02
EU-154	Not Detected	--------	1.91E-01
EU-155	Not Detected	--------	1.51E-01
FE-59	Not Detected	--------	9.16E-02
GD-153	Not Detected	--------	1.26E-01
HG-203	Not Detected	--------	3.84E-02
I-131	Not Detected	--------	9.58E-02
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.28E-02
K-40	1.78E+01	2.44	3.53E-01
LA-140	Not Detected	--------	8.62
MN-54	Not Detected	--------	3.71E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	7.70
NA-22	Not Detected	--------	4.43E-02
NA-24	Not Detected	--------	9.86E+04
NB-95	Not Detected	--------	2.38
ND-147	Not Detected	--------	5.06E-01
NI-57	Not Detected	--------	2.52E+01
BE-07	Not Detected	--------	3.26E-01
RU-103	Not Detected	--------	3.84E-02
RU-106	Not Detected	--------	3.16E-01
SB-122	Not Detected	--------	1.33
SB-124	Not Detected	--------	3.90E-02
SB-125	Not Detected	--------	9.91E-02
SC-46	Not Detected	--------	5.91E-02
SR-85	Not Detected	--------	4.44E-02
TA-182	Not Detected	--------	1.69E-01
TA-183	Not Detected	--------	3.04
TE-132	Not Detected	--------	5.16E-01
TL-201	Not Detected	--------	3.51
V-48	Not Detected	--------	6.07E-02
XE-133	Not Detected	--------	8.94
Y-88	Not Detected	--------	2.77E-02
ZN-65	Not Detected	--------	1.11E-01
ZR-95	Not Detected	--------	6.82E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-28-96 3:39:13 AM *
****

* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *

Customer : M.YOUNG (7585)
Customer Sample ID : 027982-02
Lab Sample ID : 60021606

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 657.000 gram
Sample Date/Time : 3-14-96 1:54:00 PM
Acquire Start Date : 3-28-96 1:56:22 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.98
TH-234	1.30	4.53E-01	6.50E-01
RA-226	2.55	7.26E-01	9.40E-01
PB-214	9.15E-01	1.45E-01	7.65E-02
BI-214	8.01E-01	1.35E-01	8.87E-02
TH-232	9.62E-01	4.82E-01	3.46E-01
RA-228	1.11	2.89E-01	1.52E-01
AC-228	1.18	2.11E-01	1.11E-01
TH-228	1.20	3.22E-01	5.42E-01
RA-224	1.25	3.03E-01	7.41E-02
PB-212	1.20	1.99E-01	4.81E-02
BI-212	1.53	3.80E-01	4.10E-01
TL-208	1.10	1.79E-01	1.18E-01
U-235	Not Detected	--------	2.84E-01
TH-231	Not Detected	--------	3.29
PA-231	Not Detected	--------	1.81
TH-227	Not Detected	--------	4.54E-01
RA-223	Not Detected	--------	4.89E-01
RN-219	Not Detected	--------	4.97E-01
PB-211	Not Detected	--------	1.17
TL-207	Not Detected	--------	1.47E+01
AM-241	Not Detected	--------	6.62E-01
PU-239	Not Detected	--------	6.09E+02
NP-237	Not Detected	--------	3.34E-01
PA-233	Not Detected	--------	7.19E-02
TH-229	Not Detected	--------	3.38E-01

[Summary Report] - Sample ID: 60021606

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.80E-02
AG-110m	Not Detected	--------	1.06E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	7.41E-02
BA-140	Not Detected	--------	2.63E-01
CD-109	Not Detected	--------	1.17
CD-115	Not Detected	--------	5.45
CE-139	Not Detected	--------	3.77E-02
CE-141	Not Detected	--------	8.54E-02
CE-144	Not Detected	--------	2.97E-01
CO-56	Not Detected	--------	4.40E-02
CO-57	Not Detected	--------	3.88E-02
CO-58	Not Detected	--------	3.93E-02
CO-60	Not Detected	--------	4.18E-02
CR-51	Not Detected	--------	3.92E-01
CS-134	Not Detected	--------	5.93E-02
CS-137	1.40	1.89E-01	4.02E-02
CU-64	Not Detected	--------	4.23E+08
EU-152	Not Detected	--------	1.11E-01
EU-154	Not Detected	--------	2.16E-01
EU-155	Not Detected	--------	1.68E-01
FE-59	Not Detected	--------	9.74E-02
GD-153	Not Detected	--------	1.39E-01
HG-203	Not Detected	--------	4.45E-02
I-131	Not Detected	--------	1.12E-01
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.81E-02
K-40	1.93E+01	2.63	3.59E-01
LA-140	Not Detected	--------	1.13E+01
MN-54	Not Detected	--------	2.83E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	8.36
NA-22	Not Detected	--------	4.64E-02
NA-24	Not Detected	--------	1.23E+05
NB-95	Not Detected	--------	2.83
ND-147	Not Detected	--------	5.44E-01
NI-57	Not Detected	--------	3.04E+01
BE-07	Not Detected	--------	3.94E-01
RU-103	Not Detected	--------	4.39E-02
RU-106	Not Detected	--------	3.43E-01
SB-122	Not Detected	--------	1.53
SB-124	Not Detected	--------	4.18E-02
SB-125	Not Detected	--------	1.11E-01
SC-46	Not Detected	--------	6.43E-02
SR-85	Not Detected	--------	5.23E-02
TA-182	Not Detected	--------	1.84E-01
TA-183	Not Detected	--------	3.61
TE-132	Not Detected	--------	5.96E-01
TL-201	Not Detected	--------	4.19
V-48	Not Detected	--------	6.94E-02
XE-133	Not Detected	--------	1.09E+01
Y-88	Not Detected	--------	3.33E-02
ZN-65	Not Detected	--------	1.19E-01
ZR-95	Not Detected	--------	7.61E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-28-96 5:26:15 AM *
****

* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *

Customer : M.YOUNG (7585)
Customer Sample ID : 027985-02
Lab Sample ID : 60021607

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 549.000 gram
Sample Date/Time : 3-14-96 2:15:00 PM
Acquire Start Date : 3-28-96 3:43:24 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.71
TH-234	1.50	5.16E-01	7.93E-01
RA-226	2.65	8.22E-01	1.10
PB-214	8.80E-01	1.49E-01	1.05E-01
BI-214	8.29E-01	1.38E-01	7.94E-02
TH-232	1.29	6.09E-01	3.17E-01
RA-228	1.15	2.57E-01	1.66E-01
AC-228	1.23	2.24E-01	1.23E-01
TH-228	1.14	3.63E-01	6.77E-01
RA-224	1.20	3.01E-01	1.08E-01
PB-212	1.31	2.11E-01	5.11E-02
BI-212	1.60	4.10E-01	4.47E-01
TL-208	1.06	1.84E-01	1.43E-01
U-235	Not Detected	--------	3.14E-01
TH-231	Not Detected	--------	3.61
PA-231	Not Detected	--------	2.03
TH-227	Not Detected	--------	5.13E-01
RA-223	Not Detected	--------	5.39E-01
RN-219	Not Detected	--------	5.57E-01
PB-211	Not Detected	--------	1.29
TL-207	Not Detected	--------	1.77E+01
AM-241	Not Detected	--------	7.51E-01
PU-239	Not Detected	--------	8.75E+02
NP-237	Not Detected	--------	3.65E-01
PA-233	Not Detected	--------	8.24E-02
TH-229	Not Detected	--------	3.84E-01

[Summary Report] - Sample ID: 60021607

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	5.27E-02
AG-110m	Not Detected	--------	1.33E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	8.40E-02
BA-140	Not Detected	--------	3.05E-01
CD-109	Not Detected	--------	1.28
CD-115	Not Detected	--------	6.34
CE-139	Not Detected	--------	4.26E-02
CE-141	Not Detected	--------	9.40E-02
CE-144	Not Detected	--------	3.29E-01
CO-56	Not Detected	--------	4.98E-02
CO-57	Not Detected	--------	4.39E-02
CO-58	Not Detected	--------	4.39E-02
CO-60	Not Detected	--------	4.49E-02
CR-51	Not Detected	--------	4.62E-01
CS-134	Not Detected	--------	6.57E-02
CS-137	1.95	2.61E-01	5.79E-02
CU-64	Not Detected	--------	5.07E+08
EU-152	Not Detected	--------	1.25E-01
EU-154	Not Detected	--------	2.38E-01
EU-155	Not Detected	--------	1.86E-01
FE-59	Not Detected	--------	1.05E-01
GD-153	Not Detected	--------	1.58E-01
HG-203	Not Detected	--------	4.92E-02
I-131	Not Detected	--------	1.29E-01
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	4.42E-02
K-40	1.97E+01	2.71	3.99E-01
LA-140	Not Detected	--------	1.39E+01
MN-54	Not Detected	--------	4.62E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	9.79
NA-22	Not Detected	--------	5.25E-02
NA-24	Not Detected	--------	1.47E+05
NB-95	Not Detected	--------	3.23
ND-147	Not Detected	--------	6.54E-01
NI-57	Not Detected	--------	3.56E+01
BE-07	Not Detected	--------	4.45E-01
RU-103	Not Detected	--------	5.04E-02
RU-106	Not Detected	--------	3.70E-01
SB-122	Not Detected	--------	1.75
SB-124	Not Detected	--------	4.80E-02
SB-125	Not Detected	--------	1.34E-01
SC-46	Not Detected	--------	7.10E-02
SR-85	Not Detected	--------	5.80E-02
TA-182	Not Detected	--------	2.05E-01
TA-183	Not Detected	--------	4.12
TE-132	Not Detected	--------	6.94E-01
TL-201	Not Detected	--------	5.01
V-48	Not Detected	--------	7.28E-02
XE-133	Not Detected	--------	1.20E+01
Y-88	Not Detected	--------	3.28E-02
ZN-65	Not Detected	--------	1.29E-01
ZR-95	Not Detected	--------	8.93E-02

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******************************************************************************
*                       Sandia National Laboratories                         *
*     Radiation Protection Sample Diagnostics Program [881 Laboratory]       *
*                          3-28-96   7:13:26 AM                              *
******************************************************************************
*                                                                            *
* Analyzed by:            4/1/96       Reviewed by:            4/1/96        *
******************************************************************************
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Customer : M.YOUNG (7585)
Customer Sample ID : 027986-02
Lab Sample ID : 60021608

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 590.000 gram
Sample Date/Time : 3-14-96 2:18:00 PM
Acquire Start Date : 3-28-96 5:30:33 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.38
TH-234	1.90	8.94E-01	8.72E-01
RA-226	2.50	7.70E-01	1.03
PB-214	8.90E-01	1.41E-01	7.18E-02
BI-214	8.09E-01	1.35E-01	8.47E-02
TH-232	1.06	4.94E-01	2.11E-01
RA-228	1.26	2.61E-01	1.51E-01
AC-228	1.40	2.53E-01	1.52E-01
TH-228	1.16	3.45E-01	6.28E-01
RA-224	1.25	3.13E-01	1.23E-01
PB-212	1.28	2.19E-01	5.15E-02
BI-212	1.62	4.63E-01	5.68E-01
TL-208	1.22	1.92E-01	1.01E-01
U-235	Not Detected	--------	3.03E-01
TH-231	Not Detected	--------	3.54
PA-231	Not Detected	--------	1.96
TH-227	Not Detected	--------	4.94E-01
RA-223	Not Detected	--------	5.36E-01
RN-219	Not Detected	--------	5.66E-01
PB-211	Not Detected	--------	1.32
TL-207	Not Detected	--------	1.66E+01
AM-241	Not Detected	--------	7.11E-01
PU-239	Not Detected	--------	5.41E+02
NP-237	Not Detected	--------	4.21E-01
PA-233	Not Detected	--------	7.86E-02
TH-229	Not Detected	--------	3.63E-01

[Summary Report] - Sample ID: 60021608

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.97E-02
AG-110m	Not Detected	--------	1.23E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	7.99E-02
BA-140	Not Detected	--------	2.89E-01
CD-109	Not Detected	--------	1.48
CD-115	Not Detected	--------	6.14
CE-139	Not Detected	--------	4.21E-02
CE-141	Not Detected	--------	9.26E-02
CE-144	Not Detected	--------	3.15E-01
CO-56	Not Detected	--------	4.64E-02
CO-57	Not Detected	--------	4.19E-02
CO-58	Not Detected	--------	3.95E-02
CO-60	Not Detected	--------	4.26E-02
CR-51	Not Detected	--------	4.34E-01
CS-134	Not Detected	--------	6.26E-02
CS-137	1.80	2.41E-01	4.83E-02
CU-64	Not Detected	--------	5.10E+08
EU-152	Not Detected	--------	1.18E-01
EU-154	Not Detected	--------	2.26E-01
EU-155	Not Detected	--------	1.81E-01
FE-59	Not Detected	--------	1.04E-01
GD-153	Not Detected	--------	1.49E-01
HG-203	Not Detected	--------	4.64E-02
I-131	Not Detected	--------	1.23E-01
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	4.25E-02
K-40	1.75E+01	2.41	4.14E-01
LA-140	Not Detected	--------	1.34E+01
MN-54	Not Detected	--------	2.50E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	9.47
NA-22	Not Detected	--------	4.64E-02
NA-24	Not Detected	--------	1.41E+05
NB-95	Not Detected	--------	3.15
ND-147	Not Detected	--------	6.02E-01
NI-57	Not Detected	--------	3.05E+01
BE-07	Not Detected	--------	4.31E-01
RU-103	Not Detected	--------	4.93E-02
RU-106	Not Detected	--------	3.54E-01
SB-122	Not Detected	--------	1.72
SB-124	Not Detected	--------	4.43E-02
SB-125	Not Detected	--------	1.25E-01
SC-46	Not Detected	--------	6.66E-02
SR-85	Not Detected	--------	5.68E-02
TA-182	Not Detected	--------	1.90E-01
TA-183	Not Detected	--------	3.89
TE-132	Not Detected	--------	6.62E-01
TL-201	Not Detected	--------	4.73
V-48	Not Detected	--------	6.84E-02
XE-133	Not Detected	--------	1.19E+01
Y-88	Not Detected	--------	3.86E-02
ZN-65	Not Detected	--------	1.19E-01
ZR-95	Not Detected	--------	8.09E-02

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-28-96 9:00:26 AM
*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027987-02
Lab Sample ID : 60021609

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 539.000 gram
Sample Date/Time : 3-14-96 2:20:00 PM
Acquire Start Date : 3-28-96 7:17:35 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.36
TH-234	1.11	4.31E-01	7.03E-01
RA-226	2.82	8.71E-01	1.17
PB-214	8.43E-01	1.44E-01	1.02E-01
BI-214	7.47E-01	1.27E-01	8.06E-02
TH-232	1.23	5.90E-01	3.35E-01
RA-228	1.20	2.30E-01	1.75E-01
AC-228	1.13	2.12E-01	1.34E-01
TH-228	1.06	3.28E-01	6.21E-01
RA-224	1.19	3.02E-01	1.26E-01
PB-212	1.23	2.05E-01	5.33E-02
BI-212	1.30	4.58E-01	3.55E-01
TL-208	1.10	1.87E-01	1.35E-01
U-235	~~1.21E-01~~	~~2.39E-01~~	3.08E-01 NS Detected 4/1/96
TH-231	Not Detected	--------	3.50
PA-231	Not Detected	--------	1.93
TH-227	Not Detected	--------	5.08E-01
RA-223	Not Detected	--------	5.27E-01
RN-219	Not Detected	--------	5.63E-01
PB-211	Not Detected	--------	1.28
TL-207	Not Detected	--------	1.60E+01
AM-241	Not Detected	--------	7.20E-01
PU-239	Not Detected	--------	4.70E+02
NP-237	Not Detected	--------	3.34E-01
PA-233	Not Detected	--------	7.97E-02
TH-229	Not Detected	--------	3.67E-01

[Summary Report] - Sample ID: 60021609

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	5.15E-02
AG-110m	Not Detected	--------	1.24E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	8.05E-02
BA-140	Not Detected	--------	2.96E-01
CD-109	Not Detected	--------	1.17
CD-115	Not Detected	--------	6.31
CE-139	Not Detected	--------	4.21E-02
CE-141	Not Detected	--------	9.23E-02
CE-144	Not Detected	--------	3.15E-01
CO-56	Not Detected	--------	4.89E-02
CO-57	Not Detected	--------	4.36E-02
CO-58	Not Detected	--------	4.32E-02
CO-60	Not Detected	--------	4.54E-02
CR-51	Not Detected	--------	4.51E-01
CS-134	Not Detected	--------	6.49E-02
CS-137	1.61	2.17E-01	4.52E-02
CU-64	Not Detected	--------	5.52E+08
EU-152	Not Detected	--------	1.20E-01
EU-154	Not Detected	--------	2.33E-01
EU-155	Not Detected	--------	1.82E-01
FE-59	Not Detected	--------	1.06E-01
GD-153	Not Detected	--------	1.50E-01
HG-203	~~5.81E-02~~	~~3.24E-02~~	4.88E-02 Not detected 4/1/96
I-131	Not Detected	--------	1.24E-01
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	4.35E-02
K-40	1.72E+01	2.38	4.33E-01
LA-140	Not Detected	--------	1.33E+01
MN-54	Not Detected	--------	4.41E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	9.67
NA-22	Not Detected	--------	5.08E-02
NA-24	Not Detected	--------	1.67E+05
NB-95	Not Detected	--------	3.29
ND-147	Not Detected	--------	6.14E-01
NI-57	Not Detected	--------	3.56E+01
BE-07	Not Detected	--------	4.29E-01
RU-103	Not Detected	--------	4.99E-02
RU-106	Not Detected	--------	3.89E-01
SB-122	Not Detected	--------	1.80
SB-124	Not Detected	--------	4.93E-02
SB-125	Not Detected	--------	1.24E-01
SC-46	Not Detected	--------	7.10E-02
SR-85	Not Detected	--------	5.89E-02
TA-182	Not Detected	--------	2.05E-01
TA-183	Not Detected	--------	4.03
TE-132	Not Detected	--------	6.97E-01
TL-201	Not Detected	--------	4.82
V-48	Not Detected	--------	7.35E-02
XE-133	Not Detected	--------	1.23E+01
Y-88	Not Detected	--------	4.04E-02
ZN-65	Not Detected	--------	1.30E-01
ZR-95	Not Detected	--------	8.26E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

3-28-96 10:47:26 AM

Analyzed by: 4/1/96 Reviewed by: 4/1/96

Customer : M.YOUNG (7585)
Customer Sample ID : 027990-02
Lab Sample ID : 60021610

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 873.000 gram
Sample Date/Time : 3-14-96 2:48:00 PM
Acquire Start Date : 3-28-96 9:04:35 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.97
TH-234	9.97E-01	3.24E-01	4.61E-01
RA-226	6.96E-01	6.16E-01	9.77E-01
PB-214	5.65E-01	9.82E-02	7.59E-02
BI-214	5.07E-01	9.15E-02	7.39E-02
TH-232	7.09E-01	3.37E-01	1.79E-01
RA-228	7.74E-01	1.72E-01	1.17E-01
AC-228	7.65E-01	1.46E-01	1.02E-01
TH-228	6.67E-01	2.11E-01	3.91E-01
RA-224	8.08E-01	2.00E-01	6.32E-02
PB-212	7.30E-01	1.22E-01	3.21E-02
BI-212	9.58E-01	2.82E-01	3.47E-01
TL-208	6.61E-01	1.13E-01	8.49E-02
U-235	Not Detected	--------	2.01E-01
TH-231	Not Detected	--------	2.35
PA-231	Not Detected	--------	1.23
TH-227	Not Detected	--------	3.10E-01
RA-223	Not Detected	--------	3.57E-01
RN-219	Not Detected	--------	3.32E-01
PB-211	Not Detected	--------	7.56E-01
TL-207	Not Detected	--------	1.19E+01
AM-241	Not Detected	--------	4.70E-01
PU-239	Not Detected	--------	4.42E+02
NP-237	Not Detected	--------	2.24E-01
PA-233	Not Detected	--------	4.94E-02
TH-229	Not Detected	--------	2.50E-01

[Summary Report] - Sample ID: 60021610

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.54E-02
AG-110m	Not Detected	--------	3.53E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.06E-02
BA-140	Not Detected	--------	1.84E-01
CD-109	Not Detected	--------	7.84E-01
CD-115	Not Detected	--------	4.01
CE-139	Not Detected	--------	2.73E-02
CE-141	Not Detected	--------	6.14E-02
CE-144	Not Detected	--------	2.15E-01
CO-56	Not Detected	--------	3.19E-02
CO-57	Not Detected	--------	2.83E-02
CO-58	Not Detected	--------	3.01E-02
CO-60	Not Detected	--------	3.08E-02
CR-51	Not Detected	--------	2.70E-01
CS-134	Not Detected	--------	4.07E-02
CS-137	9.37E-02	2.90E-02	2.00E-02
CU-64	Not Detected	--------	4.41E+08
EU-152	Not Detected	--------	7.31E-02
EU-154	Not Detected	--------	1.58E-01
EU-155	Not Detected	--------	1.21E-01
FE-59	Not Detected	--------	7.17E-02
GD-153	Not Detected	--------	1.02E-01
HG-203	Not Detected	--------	3.01E-02
I-131	Not Detected	--------	7.64E-02
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.58E-02
K-40	1.86E+01	2.52	2.37E-01
LA-140	Not Detected	--------	8.78
MN-54	Not Detected	--------	3.05E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	6.75
NA-22	Not Detected	--------	3.59E-02
NA-24	Not Detected	--------	1.25E+05
NB-95	Not Detected	--------	2.03
ND-147	Not Detected	--------	4.01E-01
NI-57	Not Detected	--------	2.37E+01
BE-07	Not Detected	--------	2.46E-01
RU-103	Not Detected	--------	3.04E-02
RU-106	Not Detected	--------	2.48E-01
SB-122	Not Detected	--------	1.17
SB-124	Not Detected	--------	3.06E-02
SB-125	Not Detected	--------	7.23E-02
SC-46	Not Detected	--------	4.95E-02
SR-85	Not Detected	--------	3.56E-02
TA-182	Not Detected	--------	1.42E-01
TA-183	Not Detected	--------	2.63
TE-132	Not Detected	--------	4.51E-01
TL-201	Not Detected	--------	3.20
V-48	Not Detected	--------	5.54E-02
XE-133	Not Detected	--------	8.32
Y-88	Not Detected	--------	2.40E-02
ZN-65	Not Detected	--------	8.93E-02
ZR-95	Not Detected	--------	5.64E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-28-96 1:38:40 PM *
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*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027991-02
Lab Sample ID : 60021611

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 824.000 gram
Sample Date/Time : 3-14-96 2:55:00 PM
Acquire Start Date : 3-28-96 11:54:54 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.01
TH-234	8.50E-01	1.95E-01	4.76E-01
RA-226	1.13	3.77E-01	4.75E-01
PB-214	5.97E-01	9.84E-02	6.17E-02
BI-214	4.53E-01	7.64E-02	4.37E-02
TH-232	6.72E-01	3.18E-01	1.59E-01
RA-228	8.15E-01	1.83E-01	1.24E-01
AC-228	7.62E-01	1.48E-01	1.10E-01
TH-228	7.87E-01	2.36E-01	4.04E-01
RA-224	7.50E-01	1.89E-01	6.58E-02
PB-212	7.17E-01	1.21E-01	3.55E-02
BI-212	8.46E-01	2.68E-01	3.37E-01
TL-208	6.63E-01	1.18E-01	9.64E-02
U-235	Not Detected	--------	2.09E-01
TH-231	Not Detected	--------	2.45
PA-231	Not Detected	--------	1.27
TH-227	Not Detected	--------	3.22E-01
RA-223	Not Detected	--------	3.73E-01
RN-219	Not Detected	--------	3.45E-01
PB-211	Not Detected	--------	8.00E-01
TL-207	Not Detected	--------	1.26E+01
AM-241	Not Detected	--------	4.75E-01
PU-239	Not Detected	--------	3.95E+02
NP-237	Not Detected	--------	2.40E-01
PA-233	Not Detected	--------	5.03E-02
TH-229	Not Detected	--------	2.54E-01

[Summary Report] - Sample ID: 60021611

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.59E-02
AG-110m	Not Detected	--------	3.52E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.33E-02
BA-140	Not Detected	--------	1.95E-01
CD-109	Not Detected	--------	8.42E-01
CD-115	Not Detected	--------	4.24
CE-139	Not Detected	--------	2.78E-02
CE-141	Not Detected	--------	6.25E-02
CE-144	Not Detected	--------	2.21E-01
CO-56	Not Detected	--------	3.44E-02
CO-57	Not Detected	--------	2.93E-02
CO-58	Not Detected	--------	3.16E-02
CO-60	Not Detected	--------	3.27E-02
CR-51	Not Detected	--------	2.87E-01
CS-134	Not Detected	--------	4.11E-02
CS-137	8.40E-02	1.90E-02	1.89E-02
CU-64	Not Detected	--------	5.32E+08
EU-152	Not Detected	--------	7.66E-02
EU-154	Not Detected	--------	1.62E-01
EU-155	Not Detected	--------	1.27E-01
FE-59	Not Detected	--------	7.91E-02
GD-153	Not Detected	--------	1.05E-01
HG-203	Not Detected	--------	3.11E-02
I-131	Not Detected	--------	7.99E-02
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.70E-02
K-40	1.84E+01	2.49	2.88E-01
LA-140	Not Detected	--------	9.01
~~MN-54~~	~~2.28E-02~~	~~1.90E-02~~	2.98E-02 Not detected J 4/1/96
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	7.19
NA-22	Not Detected	--------	3.82E-02
NA-24	Not Detected	--------	1.42E+05
NB-95	Not Detected	--------	2.16
ND-147	Not Detected	--------	4.03E-01
NI-57	Not Detected	--------	2.55E+01
BE-07	Not Detected	--------	2.64E-01
RU-103	Not Detected	--------	3.04E-02
RU-106	Not Detected	--------	2.55E-01
SB-122	Not Detected	--------	1.24
SB-124	Not Detected	--------	3.13E-02
SB-125	Not Detected	--------	7.68E-02
SC-46	Not Detected	--------	4.97E-02
SR-85	Not Detected	--------	3.77E-02
TA-182	Not Detected	--------	1.42E-01
TA-183	Not Detected	--------	2.70
TE-132	Not Detected	--------	4.65E-01
TL-201	Not Detected	--------	3.40
V-48	Not Detected	--------	5.55E-02
XE-133	Not Detected	--------	9.08
Y-88	Not Detected	--------	2.51E-02
ZN-65	Not Detected	--------	9.26E-02
ZR-95	Not Detected	--------	6.19E-02

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**********************************************************************
*                  Sandia National Laboratories                      *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]  *
*                      3-28-96  3:52:32 PM                           *
**********************************************************************
*                                                                    *
* Analyzed by:                4/1/96      Reviewed by:               *
**********************************************************************
```

Customer : M.YOUNG (7585)
Customer Sample ID : 027992-02
Lab Sample ID : 60021612

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 730.000 gram
Sample Date/Time : 3-14-96 3:00:00 PM
Acquire Start Date : 3-28-96 2:09:42 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.43
TH-234	1.36	4.32E-01	5.80E-01
RA-226	1.83	5.95E-01	8.07E-01
PB-214	6.91E-01	1.14E-01	7.25E-02
BI-214	6.43E-01	1.06E-01	5.95E-02
TH-232	8.56E-01	4.23E-01	2.88E-01
RA-228	8.65E-01	1.93E-01	1.34E-01
AC-228	8.17E-01	1.55E-01	9.99E-02
TH-228	8.71E-01	2.75E-01	5.06E-01
RA-224	8.46E-01	2.14E-01	7.55E-02
PB-212	8.21E-01	1.39E-01	4.14E-02
BI-212	9.80E-01	2.99E-01	3.69E-01
TL-208	7.86E-01	1.32E-01	9.17E-02
U-235	Not Detected	--------	2.39E-01
TH-231	Not Detected	--------	2.82
PA-231	Not Detected	--------	1.52
TH-227	Not Detected	--------	3.70E-01
RA-223	Not Detected	--------	4.24E-01
RN-219	Not Detected	--------	4.18E-01
PB-211	Not Detected	--------	9.72E-01
TL-207	Not Detected	--------	1.32E+01
AM-241	Not Detected	--------	5.53E-01
PU-239	Not Detected	--------	3.67E+02
NP-237	Not Detected	--------	2.67E-01
PA-233	Not Detected	--------	6.20E-02
TH-229	Not Detected	--------	2.89E-01

[Summary Report] - Sample ID: 60021612

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.89E-02
AG-110m	Not Detected	--------	8.71E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.30E-02
BA-140	Not Detected	--------	2.27E-01
CD-109	Not Detected	--------	9.38E-01
CD-115	Not Detected	--------	5.27
CE-139	Not Detected	--------	3.24E-02
CE-141	Not Detected	--------	7.29E-02
CE-144	Not Detected	--------	2.50E-01
CO-56	Not Detected	--------	3.94E-02
CO-57	Not Detected	--------	3.37E-02
CO-58	Not Detected	--------	3.46E-02
CO-60	Not Detected	--------	3.81E-02
CR-51	Not Detected	--------	3.41E-01
CS-134	Not Detected	--------	5.03E-02
CS-137	1.08	1.46E-01	3.96E-02
CU-64	Not Detected	--------	6.48E+08
EU-152	Not Detected	--------	9.51E-02
EU-154	Not Detected	--------	1.77E-01
EU-155	Not Detected	--------	1.42E-01
FE-59	Not Detected	--------	8.72E-02
GD-153	Not Detected	--------	1.18E-01
HG-203	Not Detected	--------	3.68E-02
I-131	Not Detected	--------	9.93E-02
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.29E-02
K-40	1.74E+01	2.37	3.11E-01
LA-140	Not Detected	--------	1.10E+01
MN-54	Not Detected	--------	3.51E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	8.70
NA-22	Not Detected	--------	4.16E-02
NA-24	Not Detected	--------	1.74E+05
NB-95	Not Detected	--------	2.51
ND-147	Not Detected	--------	4.81E-01
NI-57	Not Detected	--------	3.09E+01
BE-07	Not Detected	--------	3.33E-01
RU-103	Not Detected	--------	3.82E-02
RU-106	Not Detected	--------	2.95E-01
SB-122	Not Detected	--------	1.47
SB-124	Not Detected	--------	3.66E-02
SB-125	Not Detected	--------	9.35E-02
SC-46	Not Detected	--------	5.80E-02
SR-85	Not Detected	--------	4.40E-02
TA-182	Not Detected	--------	1.65E-01
TA-183	Not Detected	--------	3.19
TE-132	Not Detected	--------	5.73E-01
TL-201	Not Detected	--------	3.83
V-48	Not Detected	--------	5.83E-02
XE-133	Not Detected	--------	1.07E+01
Y-88	Not Detected	--------	2.82E-02
ZN-65	Not Detected	--------	1.06E-01
ZR-95	Not Detected	--------	6.71E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

3-28-96 5:39:34 PM

Analyzed by: 4/1/96 Reviewed by: 4/1/96

Customer : M.YOUNG (7585)
Customer Sample ID : 027994-02
Lab Sample ID : 60021613

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 616.000 gram
Sample Date/Time : 3-14-96 3:10:00 PM
Acquire Start Date : 3-28-96 3:56:40 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.15
TH-234	1.94	5.62E-01	7.00E-01
RA-226	2.59	3.97E-01	7.21E-01
PB-214	8.11E-01	1.34E-01	8.46E-02
BI-214	6.99E-01	1.20E-01	8.20E-02
TH-232	1.12	5.20E-01	2.27E-01
RA-228	1.18	3.70E-01	1.72E-01
AC-228	1.19	2.20E-01	1.42E-01
TH-228	1.26	3.44E-01	5.55E-01
RA-224	1.05	2.62E-01	8.66E-02
PB-212	1.11	1.85E-01	4.78E-02
BI-212	1.21	3.66E-01	4.50E-01
TL-208	9.50E-01	1.80E-01	1.70E-01
U-235	Not Detected	--------	2.87E-01
TH-231	Not Detected	--------	3.27
PA-231	Not Detected	--------	1.77
TH-227	Not Detected	--------	4.52E-01
RA-223	Not Detected	--------	4.99E-01
RN-219	Not Detected	--------	5.11E-01
PB-211	Not Detected	--------	1.20
TL-207	Not Detected	--------	1.61E+01
AM-241	Not Detected	--------	6.57E-01
PU-239	Not Detected	--------	5.82E+02
NP-237	Not Detected	--------	3.34E-01
PA-233	Not Detected	--------	7.23E-02
TH-229	Not Detected	--------	3.43E-01

[Summary Report] - Sample ID: 60021613

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.85E-02
AG-110m	Not Detected	--------	1.09E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	7.56E-02
BA-140	Not Detected	--------	2.81E-01
CD-109	Not Detected	--------	1.17
CD-115	Not Detected	--------	6.60
CE-139	Not Detected	--------	3.87E-02
CE-141	Not Detected	--------	8.69E-02
CE-144	Not Detected	--------	2.98E-01
CO-56	Not Detected	--------	4.44E-02
CO-57	Not Detected	--------	4.05E-02
CO-58	Not Detected	--------	3.92E-02
CO-60	Not Detected	--------	4.19E-02
CR-51	Not Detected	--------	4.07E-01
CS-134	Not Detected	--------	5.89E-02
CS-137	1.40	1.88E-01	3.77E-02
CU-64	Not Detected	--------	8.21E+08
EU-152	Not Detected	--------	1.10E-01
EU-154	Not Detected	--------	2.18E-01
EU-155	Not Detected	--------	1.71E-01
FE-59	Not Detected	--------	9.49E-02
GD-153	Not Detected	--------	1.43E-01
HG-203	Not Detected	--------	4.40E-02
I-131	Not Detected	--------	1.19E-01
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.94E-02
K-40	1.84E+01	2.53	3.97E-01
LA-140	Not Detected	--------	1.42E+01
MN-54	Not Detected	--------	4.11E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.02E+01
NA-22	Not Detected	--------	4.42E-02
NA-24	Not Detected	--------	2.38E+05
NB-95	Not Detected	--------	3.11
ND-147	Not Detected	--------	5.86E-01
NI-57	Not Detected	--------	3.93E+01
BE-07	Not Detected	--------	3.95E-01
RU-103	Not Detected	--------	4.39E-02
RU-106	Not Detected	--------	3.50E-01
SB-122	Not Detected	--------	1.81
SB-124	Not Detected	--------	4.44E-02
SB-125	Not Detected	--------	1.14E-01
SC-46	Not Detected	--------	6.60E-02
SR-85	Not Detected	--------	5.35E-02
TA-182	Not Detected	--------	1.89E-01
TA-183	Not Detected	--------	3.81
TE-132	Not Detected	--------	6.80E-01
TL-201	Not Detected	--------	4.81
V-48	Not Detected	--------	6.85E-02
XE-133	Not Detected	--------	1.25E+01
Y-88	Not Detected	--------	3.30E-02
ZN-65	Not Detected	--------	1.22E-01
ZR-95	Not Detected	--------	7.55E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

3-28-96 7:26:38 PM

Analyzed by: 4/1/96 Reviewed by: 4/1/96

Customer : M.YOUNG (7585)
Customer Sample ID : 027997-02
Lab Sample ID : 60021614

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 634.000 gram
Sample Date/Time : 3-14-96 3:05:00 PM
Acquire Start Date : 3-28-96 5:43:45 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.99
TH-234	Not Detected	--------	6.41E-01
RA-226	1.98	6.29E-01	8.45E-01
PB-214	8.14E-01	1.36E-01	9.03E-02
BI-214	7.30E-01	1.25E-01	8.37E-02
TH-232	1.03	4.84E-01	2.43E-01
RA-228	1.18	3.81E-01	1.54E-01
AC-228	1.09	2.01E-01	1.22E-01
TH-228	8.52E-01	2.88E-01	5.88E-01
RA-224	1.13	2.79E-01	7.46E-02
PB-212	1.03	1.71E-01	4.58E-02
BI-212	1.25	3.77E-01	4.69E-01
TL-208	9.68E-01	1.69E-01	1.37E-01
U-235	Not Detected	--------	2.74E-01
TH-231	Not Detected	--------	3.14
PA-231	Not Detected	--------	1.72
TH-227	Not Detected	--------	4.39E-01
RA-223	Not Detected	--------	4.82E-01
RN-219	Not Detected	--------	4.90E-01
PB-211	Not Detected	--------	1.16
TL-207	Not Detected	--------	1.53E+01
AM-241	Not Detected	--------	6.33E-01
PU-239	Not Detected	--------	4.51E+02
NP-237	Not Detected	--------	3.03E-01
PA-233	Not Detected	--------	7.17E-02
TH-229	Not Detected	--------	3.37E-01

[Summary Report] - Sample ID: 60021614

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.70E-02
AG-110m	Not Detected	--------	1.01E-01
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	7.30E-02
BA-140	Not Detected	--------	2.70E-01
CD-109	Not Detected	--------	1.06
CD-115	Not Detected	--------	6.42
CE-139	Not Detected	--------	3.73E-02
CE-141	Not Detected	--------	8.36E-02
CE-144	Not Detected	--------	2.88E-01
CO-56	Not Detected	--------	4.34E-02
CO-57	Not Detected	--------	3.92E-02
CO-58	Not Detected	--------	4.04E-02
CO-60	Not Detected	--------	3.93E-02
CR-51	Not Detected	--------	3.96E-01
CS-134	Not Detected	--------	5.76E-02
CS-137	1.27	1.73E-01	4.89E-02
CU-64	Not Detected	--------	9.44E+08
EU-152	Not Detected	--------	1.03E-01
EU-154	Not Detected	--------	2.11E-01
EU-155	Not Detected	--------	1.64E-01
FE-59	Not Detected	--------	9.57E-02
GD-153	Not Detected	--------	1.37E-01
HG-203	Not Detected	--------	4.37E-02
I-131	Not Detected	--------	1.18E-01
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.83E-02
K-40	1.81E+01	2.49	3.84E-01
LA-140	Not Detected	--------	1.44E+01
MN-54	Not Detected	--------	2.12E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	9.67
NA-22	Not Detected	--------	4.43E-02
NA-24	Not Detected	--------	2.30E+05
NB-95	Not Detected	--------	3.07
ND-147	Not Detected	--------	5.86E-01
NI-57	Not Detected	--------	3.88E+01
BE-07	Not Detected	--------	3.67E-01
RU-103	Not Detected	--------	4.44E-02
RU-106	Not Detected	--------	3.52E-01
SB-122	Not Detected	--------	1.80
SB-124	Not Detected	--------	4.25E-02
SB-125	Not Detected	--------	1.11E-01
SC-46	Not Detected	--------	6.55E-02
SR-85	Not Detected	--------	5.06E-02
TA-182	Not Detected	--------	1.85E-01
TA-183	Not Detected	--------	3.73
TE-132	Not Detected	--------	6.83E-01
TL-201	Not Detected	--------	4.74
V-48	Not Detected	--------	6.75E-02
XE-133	Not Detected	--------	1.26E+01
Y-88	Not Detected	--------	3.42E-02
ZN-65	Not Detected	--------	1.18E-01
ZR-95	Not Detected	--------	7.28E-02

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*
Sandia National Laboratories
*
Radiation Protection Sample Diagnostics Program [881 Laboratory]
*
3-28-96 9:12:45 PM
*
****
*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *
****

Customer : M.YOUNG (7585)
Customer Sample ID : 027998-12
Lab Sample ID : 60021615

Sample Description : MARINELLI LIQUID SAMPLE
Sample Type : Liquid
Sample Geometry : 2WMAR
Sample Quantity : 500.000 mL
Sample Date/Time : 3-14-96 3:30:00 PM
Acquire Start Date : 3-28-96 7:30:47 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6001 seconds

Comments:

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Nuclide	Activity (pCi/mL)	2S Error	MDA
U-238	Not Detected	--------	1.69
TH-234	Not Detected	--------	3.98E-01
RA-226	Not Detected	--------	4.62E-01
PB-214	Not Detected	--------	4.30E-02
BI-214	Not Detected	--------	5.09E-02
TH-232	Not Detected	--------	1.28E-01
RA-228	Not Detected	--------	1.32E-01
AC-228	Not Detected	--------	7.56E-02
TH-228	Not Detected	--------	4.33E-01
RA-224	Not Detected	--------	1.09E-01
PB-212	Not Detected	--------	3.39E-02
BI-212	Not Detected	--------	2.91E-01
TL-208	Not Detected	--------	6.33E-02
U-235	Not Detected	--------	1.51E-01
TH-231	Not Detected	--------	1.23
PA-231	Not Detected	--------	9.17E-01
TH-227	Not Detected	--------	1.33E-01
RA-223	Not Detected	--------	1.85E-01
RN-219	Not Detected	--------	2.61E-01
PB-211	Not Detected	--------	5.83E-01
TL-207	Not Detected	--------	9.27
AM-241	Not Detected	--------	3.22E-01
PU-239	Not Detected	--------	2.71E+02
NP-237	Not Detected	--------	1.72E-01
PA-233	Not Detected	--------	3.97E-02
TH-229	Not Detected	--------	1.71E-01

[Summary Report] - Sample ID: 60021615

Nuclide	Activity (pCi/mL)	2S Error	MDA
AG-108m	Not Detected	--------	2.20E-02
AG-110m	Not Detected	--------	2.24E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	2.64E-02
BA-140	Not Detected	--------	1.51E-01
CD-109	Not Detected	--------	6.06E-01
CD-115	Not Detected	--------	2.60
CE-139	Not Detected	--------	1.99E-02
CE-141	Not Detected	--------	4.59E-02
CE-144	Not Detected	--------	1.56E-01
CO-56	Not Detected	--------	3.23E-02
CO-57	Not Detected	--------	2.14E-02
CO-58	Not Detected	--------	2.51E-02
CO-60	Not Detected	--------	2.74E-02
CR-51	Not Detected	--------	2.08E-01
CS-134	Not Detected	--------	2.55E-02
CS-137	Not Detected	--------	2.43E-02
CU-64	Not Detected	--------	6.38E+08
EU-152	Not Detected	--------	5.70E-02
EU-154	Not Detected	--------	9.93E-02
EU-155	Not Detected	--------	8.68E-02
FE-59	Not Detected	--------	5.36E-02
GD-153	Not Detected	--------	7.00E-02
HG-203	Not Detected	--------	2.17E-02
I-131	Not Detected	--------	6.00E-02
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.03E-02
K-40	Not Detected	--------	3.40E-01
LA-140	Not Detected	--------	8.19
MN-54	Not Detected	--------	2.19E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	5.93
NA-22	Not Detected	--------	2.22E-02
NA-24	Not Detected	--------	1.73E+05
NB-95	Not Detected	--------	9.61E-01
ND-147	Not Detected	--------	3.02E-01
NI-57	Not Detected	--------	2.39E+01
BE-07	Not Detected	--------	1.91E-01
RU-103	Not Detected	--------	2.52E-02
RU-106	Not Detected	--------	2.02E-01
SB-122	Not Detected	--------	1.09
SB-124	Not Detected	--------	2.74E-02
SB-125	Not Detected	--------	5.61E-02
SC-46	Not Detected	--------	2.52E-02
SR-85	Not Detected	--------	3.18E-02
TA-182	Not Detected	--------	6.93E-02
TA-183	Not Detected	--------	1.92
TE-132	Not Detected	--------	3.41E-01
TL-201	Not Detected	--------	2.02
V-48	Not Detected	--------	3.96E-02
XE-133	Not Detected	--------	5.10
Y-88	Not Detected	--------	2.59E-02
ZN-65	Not Detected	--------	4.69E-02
ZR-95	Not Detected	--------	4.20E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-29-96 7:48:05 AM *
****
*
* Analyzed by: 4/1/96 Reviewed by: 4/1/96 *
****

Customer : M.YOUNG (7585)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60021616

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 3-29-96 7:35:57 AM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:

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Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.26E+04
TH-234	Not Detected	--------	4.89E+03
RA-226	Not Detected	--------	6.43E+03
PB-214	Not Detected	--------	6.54E+02
BI-214	Not Detected	--------	6.19E+02
TH-232	Not Detected	--------	2.07E+03
RA-228	Not Detected	--------	2.89E+03
AC-228	Not Detected	--------	1.64E+03
TH-228	Not Detected	--------	4.70E+04
RA-224	Not Detected	--------	1.07E+03
PB-212	Not Detected	--------	3.48E+03
BI-212	Not Detected	--------	3.28E+04
TL-208	Not Detected	--------	6.62E+03
U-235	Not Detected	--------	1.81E+03
TH-231	Not Detected	--------	1.80E+04
PA-231	Not Detected	--------	1.42E+04
TH-227	Not Detected	--------	2.34E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.29E+03
PB-211	Not Detected	--------	1.18E+04
TL-207	Not Detected	--------	2.17E+05
AM-241	9.44E+04	1.62E+04	7.17E+03
PU-239	Not Detected	--------	3.35E+06
NP-237	Not Detected	--------	2.64E+03
PA-233	Not Detected	--------	5.79E+02
TH-229	Not Detected	--------	2.15E+03

[Summary Report] - Sample ID: 60021616

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-108m	Not Detected	--------	3.45E+02
AG-110m	Not Detected	--------	3.67E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.68E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.15E+05	1.04E+05	1.35E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	4.90E+06
CE-141	Not Detected	--------	7.98E+20
CE-144	Not Detected	--------	2.26E+05
CO-56	Not Detected	--------	1.97E+10
CO-57	Not Detected	--------	3.99E+04
CO-58	Not Detected	--------	8.63E+10
CO-60	7.52E+04	9.79E+03	5.02E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	1.82E+03
CS-137	6.80E+04	8.79E+03	5.01E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.16E+03
EU-154	Not Detected	--------	2.35E+03
EU-155	Not Detected	--------	2.32E+03
FE-59	Not Detected	--------	2.00E+16
GD-153	Not Detected	--------	2.38E+05
HG-203	Not Detected	--------	1.51E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.09E+10
K-40	Not Detected	--------	1.73E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.05E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	9.62E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	4.60E+14
RU-103	Not Detected	--------	4.55E+17
RU-106	Not Detected	--------	1.18E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	2.19E+12
SB-125	Not Detected	--------	4.11E+03
SC-46	Not Detected	--------	5.69E+09
SR-85	Not Detected	--------	4.99E+11
TA-182	Not Detected	--------	1.93E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	6.81E+07
ZN-65	Not Detected	--------	2.60E+05
ZR-95	Not Detected	--------	1.12E+12

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 3-29-96 7:50:48 AM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 60021616
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 3-29-96 7:35:57 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.301E-02	4.007E-03	9.436E-02	<	:	:	: >
CS-137 Activity	6.857E-02	2.064E-03	6.796E-02	<	:	:	: >
CO-60 Activity	7.510E-02	1.579E-03	7.476E-02	<	:	:	: >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 4/1/96

EK SITE 50UK1

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

Internal Lab Batch No. 600215

AMIR-IN-HOUSE "RUSH"

SF 2001-COC (6-95)

AR/COC- 04955

Dept. No./Mail Stop: 7585/ 1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1322/53B/DAT
Logbook Ref No: 0155
Service Order No.: CF0130

Date Samples Shipped: 3/15/96
Carrier/Waybill No.: FC
Lab Contact: AMIR MOHAGHEGHI
Lab Destination: AMIR
SMO Contact/Phone: Doug Salmi/848-0962
Send Report to SMO D. McLaughlin

Contract No.: AJ2430A
Case No.: 8935-110
SMO Authorization: DMcL

Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec

Location Tech Area TTR
Building ____ Room ____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
02 79 78 - 02	53DAT-GR-024-0.0-96	0.0	DAT 53	3-14 1335	Soil	Poly	500ml	4°C	G	SA	
02 79 83 - 02	53DAT-GR-023-0.0-96	0.0	53	" 1400	Soil	Poly	500ml	4°C	G	SA	
02 79 88 - 02	53DAT-GR-012-0.0-96	0.0	53	" 1435	Soil	Poly	500ml	4°C	G	SA	
02 79 93 - 02	53DAT-GR-010-0.0-96	0.0	53	↓ 1500	Soil	Poly	500ml	4°C	G	SA	
											LAB USE

RMMA ☑ Yes ☐ No Ref. No. ____

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☑ Rush Required Report Date ____

Sample Tracking SMO USE
Date Entered (mm/dd/yy) ____
Entered by: ____
QC inits. ____

Special Instructions/QC Requirements
- Please send "RUSH" Report to ED RANKIN - (SMO) - 844-4976 fax
RICH KOTTENSTETTE -
- NEED 24 HR TURN-A-ROUND
This COC# 04955 will release COC# 04956 to GEL

Abnormal Conditions on Receipt LAB USE

Sample Team Members

Name	Signature	Init	Company/Organization/Phone
Concetta Quisto	Concetta Quisto	CQ	Lamb/7584/234-3301
[illegible]	[illegible]	[illegible]	IT/7554
Jim Calvert	Jim Calvert	JC	Lamb/7584/234-3301

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
1. Received by	Org. 7584	Date 3-15-96	Time 0932	4. Received by	Org.	Date	Time
2. Relinquished by	Org. 7713	Date 3/15/96	Time 0932	5. Relinquished by	Org.	Date	Time
2. Received by	Org.	Date	Time	5. Received by	Org.	Date	Time
3. Relinquished by	Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics AMIR-IN-HOUSE "RUSH"

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer This goes with COC# 04955

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 7585/1148 ms
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: _____
Suspect Isotopes: _____
Other Information: 04955

Hazards/Special Instructions:
Need "24 HOUR" Turnaround

Batch Log Number: 600215
Logged By: JMS

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login _____
Results Faxed _____
Sample Disposal _____

	Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
4	027978-02	Soil	3-14-96 1335	500ml	Gamma Spec	01			
8	027983-02	Soil	" 1400	500ml	" "	02			
12	027988-02	Soil	" 1425	500ml	" "	03			
16	027993-02	Soil	↓ 1510	500ml	" "	04			
	LCS	—	1200	—	γ Spec	05			

Relinquished by Jim Calvert Date 3-15-96 Time 09:32 Received by _____ Date 3/15/96 Time 0932
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Kevin Roberts 04955 F GEL

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-15-96 11:29:58 AM

*Dept 7714 Use Only

Reviewed by: 3/17/96 Survey No. _____
Surveyed by: _____

Customer : M.YOUNG (7585)
Customer Sample ID : 027978-02
Lab Sample ID : 60021501

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 680.000 gram
Sample Date/Time : 3-14-96 1:35:00 PM
Acquire Start Date : 3-15-96 9:45:51 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Ste 58 DRT

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.85
TH-234	1.69	4.96E-01	6.88E-01
RA-226	1.90	8.54E-01	6.12E-01
PB-214	7.64E-01	1.22E-01	6.47E-02
BI-214	7.62E-01	1.26E-01	7.46E-02
TH-232	9.59E-01	4.53E-01	2.30E-01
RA-228	1.12	2.32E-01	1.35E-01
AC-228	1.17	2.11E-01	1.21E-01
TH-228	9.05E-01	3.16E-01	5.92E-01
RA-224	1.09	2.70E-01	8.71E-02
PB-212	1.03	1.70E-01	4.34E-02
BI-212	1.17	3.73E-01	4.81E-01
TL-208	8.90E-01	1.48E-01	1.01E-01
U-235	Not Detected	--------	2.69E-01
TH-231	Not Detected	--------	3.09
PA-231	Not Detected	--------	1.68
TH-227	Not Detected	--------	4.25E-01
RA-223	Not Detected	--------	2.15E-01
RN-219	Not Detected	--------	4.76E-01
PB-211	Not Detected	--------	1.11
TL-207	Not Detected	--------	1.47E+01
AM-241	Not Detected	--------	6.20E-01
PU-239	Not Detected	--------	3.61E+02
NP-237	Not Detected	--------	3.31E-01
PA-233	Not Detected	--------	7.11E-02
TH-229	Not Detected	--------	3.22E-01

[Summary Report] - Sample ID: 60021501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.13E-01
AR-41	Not Detected	--------	1.16E+02
BA-133	Not Detected	--------	6.96E-02
BA-140	Not Detected	--------	1.34E-01
CD-109	Not Detected	--------	1.14
CD-115	Not Detected	--------	9.98E-02
CE-139	Not Detected	--------	3.48E-02
CE-141	Not Detected	--------	6.18E-02
CE-144	Not Detected	--------	2.70E-01
CO-56	Not Detected	--------	3.69E-02
CO-57	Not Detected	--------	3.62E-02
CO-58	Not Detected	--------	3.30E-02
CO-60	Not Detected	--------	3.82E-02
CR-51	Not Detected	--------	2.75E-01
CS-134	Not Detected	--------	5.60E-02
CS-137	1.87	2.48E-01	3.62E-02
CU-64	Not Detected	--------	2.25E+01
EU-152	Not Detected	--------	1.07E-01
EU-154	Not Detected	--------	2.02E-01
EU-155	Not Detected	--------	1.25E-01
FE-59	Not Detected	--------	7.64E-02
GD-153	Not Detected	--------	1.28E-01
HG-203	Not Detected	--------	3.43E-02
I-131	Not Detected	--------	3.67E-02
IN-115m	Not Detected	--------	1.97
IR-192	Not Detected	--------	3.31E-02
K-40	1.86E+01	2.54	3.78E-01
LA-140	Not Detected	--------	5.57E-02
MN-52	Not Detected	--------	3.40E-02
MN-54	Not Detected	--------	3.67E-02
MN-56	Not Detected	--------	1.04E+01
MO-99	Not Detected	--------	3.44E-01
NA-22	Not Detected	--------	4.40E-02
NA-24	Not Detected	--------	9.58E-02
NB-95	Not Detected	--------	2.32E-01
ND-147	Not Detected	--------	2.46E-01
NI-57	Not Detected	--------	7.43E-02
BE-07	Not Detected	--------	3.27E-01
RU-103	Not Detected	--------	3.55E-02
RU-106	Not Detected	--------	3.20E-01
SB-122	Not Detected	--------	5.87E-02
SB-124	Not Detected	--------	3.49E-02
SB-125	Not Detected	--------	1.10E-01
SC-46	Not Detected	--------	5.38E-02
SR-85	Not Detected	--------	4.19E-02
TA-182	Not Detected	--------	1.59E-01
TA-183	Not Detected	--------	6.03E-01
TE-132	Not Detected	--------	3.94E-02
TL-201	Not Detected	--------	2.21E-01
XE-133	Not Detected	--------	1.88E-01
Y-88	Not Detected	--------	3.00E-02
ZN-65	Not Detected	--------	1.04E-01
ZR-95	Not Detected	--------	6.16E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-15-96 11:31:21 AM

Reviewed by: 3/17/96 *Dept 7714 *Use Only Survey No. _____ Surveyed by: _____

Customer : M.YOUNG (7585)
Customer Sample ID : 027983-02
Lab Sample ID : 60021502

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 610.000 gram
Sample Date/Time : 3-14-96 2:00:00 PM
Acquire Start Date : 3-15-96 9:47:49 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	1.66	1.40	2.14
TH-234	1.22	3.59E-01	4.21E-01
RA-226	1.63	6.06E-01	8.17E-01
PB-214	8.71E-01	1.91E-01	1.12E-01
BI-214	8.05E-01	1.63E-01	1.45E-01
TH-232	1.10	5.41E-01	2.70E-01
RA-228	1.06	2.61E-01	1.89E-01
AC-228	1.20	2.32E-01	1.53E-01
TH-228	Not Detected	--------	9.25E-01
RA-224	1.22	3.34E-01	1.37E-01
PB-212	1.14	2.46E-01	4.85E-02
BI-212	1.31	4.41E-01	5.63E-01
TL-208	1.17	2.20E-01	1.65E-01
U-235	Not Detected	--------	2.17E-01
TH-231	Not Detected	--------	1.91
PA-231	Not Detected	--------	1.72
TH-227	Not Detected	--------	4.74E-01
RA-223	Not Detected	--------	1.36E-01
RN-219	Not Detected	--------	5.32E-01
PB-211	Not Detected	--------	1.23
TL-207	Not Detected	--------	1.71E+01
AM-241	Not Detected	--------	1.85E-01
PU-239	Not Detected	--------	4.05E+02
NP-237	Not Detected	--------	2.86E-01
PA-233	Not Detected	--------	7.77E-02
TH-229	Not Detected	--------	2.16E-01

[Summary Report] - Sample ID: 60021502

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.25E-01
AR-41	Not Detected	--------	1.27E+02
BA-133	Not Detected	--------	7.47E-02
BA-140	Not Detected	--------	1.52E-01
CD-109	Not Detected	--------	7.88E-01
CD-115	Not Detected	--------	1.18E-01
CE-139	Not Detected	--------	3.10E-02
CE-141	Not Detected	--------	5.00E-02
CE-144	Not Detected	--------	2.10E-01
CO-56	Not Detected	--------	4.05E-02
CO-57	Not Detected	--------	2.75E-02
CO-58	Not Detected	--------	3.97E-02
CO-60	Not Detected	--------	4.63E-02
CR-51	Not Detected	--------	3.00E-01
CS-134	Not Detected	--------	7.05E-02
CS-137	1.51	2.17E-01	4.65E-02
CU-64	Not Detected	--------	2.85E+01
EU-152	Not Detected	--------	1.21E-01
EU-154	Not Detected	--------	2.37E-01
EU-155	Not Detected	--------	1.08E-01
FE-59	Not Detected	--------	8.63E-02
GD-153	Not Detected	--------	8.37E-02
HG-203	Not Detected	--------	3.57E-02
I-131	Not Detected	--------	4.25E-02
IN-115m	Not Detected	--------	2.20
IR-192	Not Detected	--------	3.57E-02
K-40	1.80E+01	2.53	5.09E-01
LA-140	Not Detected	--------	6.96E-02
MN-52	Not Detected	--------	4.47E-02
MN-54	Not Detected	--------	4.35E-02
MN-56	Not Detected	--------	1.03E+01
MO-99	Not Detected	--------	3.95E-01
NA-22	Not Detected	--------	5.22E-02
NA-24	Not Detected	--------	1.19E-01
NB-95	Not Detected	--------	2.59E-01
ND-147	Not Detected	--------	2.82E-01
NI-57	Not Detected	--------	8.94E-02
BE-07	Not Detected	--------	3.65E-01
RU-103	Not Detected	--------	3.78E-02
RU-106	Not Detected	--------	3.91E-01
SB-122	Not Detected	--------	6.56E-02
SB-124	Not Detected	--------	4.35E-02
SB-125	Not Detected	--------	1.21E-01
SC-46	Not Detected	--------	7.07E-02
SR-85	Not Detected	--------	5.06E-02
TA-182	Not Detected	--------	2.07E-01
TA-183	Not Detected	--------	1.76E-01
TE-132	Not Detected	--------	3.84E-02
TL-201	Not Detected	--------	1.11E-01
XE-133	Not Detected	--------	1.10E-01
Y-88	Not Detected	--------	3.64E-02
ZN-65	Not Detected	--------	1.36E-01
ZR-95	Not Detected	--------	7.65E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-15-96 1:39:30 PM

Reviewed by: 3/17/96 *Dept 7714 Survey No.
*Use Only Surveyed by:

ustomer : M.YOUNG (7585)
ustomer Sample ID : 027988-02
ab Sample ID : 60021503

ample Description : MARINELLI SOLID SAMPLE
ample Type : Solid
ample Geometry : 2SMAR
ample Quantity : 875.000 gram
ample Date/Time : 3-14-96 2:25:00 PM
cquire Start Date : 3-15-96 11:55:26 AM
etector Name : LAB02
lapsed Live Time : 6000 seconds
lapsed Real Time : 6003 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.92
TH-234	1.15	7.04E-01	6.38E-01
RA-226	1.44	4.30E-01	5.61E-01
PB-214	5.94E-01	9.66E-02	5.74E-02
BI-214	5.19E-01	8.57E-02	4.78E-02
TH-232	7.84E-01	3.75E-01	2.10E-01
RA-228	8.45E-01	3.05E-01	1.29E-01
AC-228	7.68E-01	1.46E-01	1.00E-01
TH-228	7.47E-01	2.18E-01	4.00E-01
RA-224	7.89E-01	1.99E-01	8.21E-02
PB-212	7.44E-01	1.24E-01	3.40E-02
BI-212	8.68E-01	2.84E-01	3.69E-01
TL-208	7.13E-01	1.19E-01	8.36E-02
U-235	Not Detected	--------	2.05E-01
TH-231	Not Detected	--------	2.32
PA-231	Not Detected	--------	1.26
TH-227	Not Detected	--------	3.16E-01
RA-223	Not Detected	--------	1.63E-01
RN-219	Not Detected	--------	3.31E-01
PB-211	Not Detected	--------	7.85E-01
TL-207	Not Detected	--------	1.21E+01
AM-241	Not Detected	--------	4.74E-01
PU-239	Not Detected	--------	3.88E+02
NP-237	Not Detected	--------	2.67E-01
PA-233	Not Detected	--------	5.10E-02
TH-229	Not Detected	--------	2.49E-01

[Summary Report] - Sample ID: 60021503

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.02E-02
AR-41	Not Detected	--------	1.56E+02
BA-133	Not Detected	--------	5.19E-02
BA-140	Not Detected	--------	9.59E-02
CD-109	Not Detected	--------	9.20E-01
CD-115	Not Detected	--------	7.30E-02
CE-139	Not Detected	--------	2.58E-02
CE-141	Not Detected	--------	4.73E-02
CE-144	Not Detected	--------	2.08E-01
CO-56	Not Detected	--------	2.86E-02
CO-57	Not Detected	--------	2.80E-02
CO-58	~~8.30E-03~~	~~4.21E-03~~	9.73E-03
CO-60	Not Detected	--------	3.01E-02
CR-51	Not Detected	--------	2.06E-01
CS-134	Not Detected	--------	4.15E-02
CS-137	1.75E-01	3.10E-02	2.45E-02
CU-64	Not Detected	--------	2.06E+01
EU-152	Not Detected	--------	7.56E-02
EU-154	Not Detected	--------	1.59E-01
EU-155	Not Detected	--------	1.22E-01
FE-59	Not Detected	--------	6.18E-02
GD-153	Not Detected	--------	9.79E-02
HG-203	Not Detected	--------	2.49E-02
I-131	Not Detected	--------	2.53E-02
IN-115m	Not Detected	--------	1.74
IR-192	Not Detected	--------	2.42E-02
K-40	1.75E+01	2.37	2.53E-01
LA-140	Not Detected	--------	4.19E-02
MN-52	Not Detected	--------	2.80E-02
MN-54	Not Detected	--------	2.92E-02
MN-56	Not Detected	--------	1.15E+01
MO-99	Not Detected	--------	2.69E-01
NA-22	Not Detected	--------	3.45E-02
NA-24	Not Detected	--------	8.43E-02
NB-95	Not Detected	--------	1.75E-01
ND-147	Not Detected	--------	1.77E-01
NI-57	Not Detected	--------	6.20E-02
BE-07	Not Detected	--------	2.15E-01
RU-103	Not Detected	--------	2.43E-02
RU-106	Not Detected	--------	2.47E-01
SB-122	Not Detected	--------	4.41E-02
SB-124	Not Detected	--------	2.69E-02
SB-125	Not Detected	--------	7.45E-02
SC-46	Not Detected	--------	4.31E-02
SR-85	Not Detected	--------	3.19E-02
TA-182	Not Detected	--------	1.26E-01
TA-183	Not Detected	--------	4.66E-01
TE-132	Not Detected	--------	2.89E-02
TL-201	Not Detected	--------	1.74E-01
XE-133	Not Detected	--------	1.41E-01
Y-88	Not Detected	--------	2.18E-02
ZN-65	Not Detected	--------	8.35E-02
ZR-95	Not Detected	--------	4.92E-02

Not detected 3/17/95

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-17-96 8:02:45 AM

Reviewed by: 3/17/96 *Dept 7714 Survey No. _____
*Use Only Surveyed by: _____

Customer : M.YOUNG (7585)
Customer Sample ID : 027993-02
Lab Sample ID : 60021504

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 621.000 gram
Sample Date/Time : 3-14-96 3:10:00 PM
Acquire Start Date : 3-15-96 11:56:59 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	7.67E-01	9.16E-01	1.45
TH-234	1.67	4.22E-01	4.56E-01
RA-226	2.16	6.01E-01	6.88E-01
PB-214	8.47E-01	1.82E-01	8.98E-02
BI-214	8.04E-01	1.44E-01	7.89E-02
TH-232	1.21	5.91E-01	1.89E-01
RA-228	1.23	4.04E-01	2.09E-01
AC-228	1.23	2.46E-01	1.91E-01
TH-228	6.20E-01	5.28E-01	8.16E-01
RA-224	1.12	3.05E-01	8.57E-02
PB-212	1.11	2.39E-01	4.62E-02
BI-212	1.03	4.13E-01	5.63E-01
TL-208	1.03	1.86E-01	1.14E-01
U-235	Not Detected	--------	2.12E-01
TH-231	Not Detected	--------	1.86
PA-231	Not Detected	--------	1.67
TH-227	Not Detected	--------	4.61E-01
RA-223	Not Detected	--------	1.33E-01
RN-219	Not Detected	--------	5.32E-01
PB-211	Not Detected	--------	1.22
TL-207	Not Detected	--------	1.73E+01
AM-241	Not Detected	--------	1.83E-01
PU-239	Not Detected	--------	4.03E+02
NP-237	Not Detected	--------	2.82E-01
PA-233	Not Detected	--------	7.46E-02
TH-229	Not Detected	--------	2.12E-01

[Summary Report] - Sample ID: 60021504

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.27E-01
AR-41	Not Detected	--------	1.92E+02
BA-133	Not Detected	--------	7.50E-02
BA-140	Not Detected	--------	1.46E-01
CD-109	Not Detected	--------	7.48E-01
CD-115	Not Detected	--------	1.17E-01
CE-139	Not Detected	--------	2.98E-02
CE-141	Not Detected	--------	4.95E-02
CE-144	Not Detected	--------	2.07E-01
CO-56	Not Detected	--------	4.03E-02
CO-57	Not Detected	--------	2.66E-02
CO-58	Not Detected	--------	4.14E-02
CO-60	Not Detected	--------	4.56E-02
CR-51	Not Detected	--------	2.93E-01
CS-134	Not Detected	--------	6.81E-02
CS-137	1.59	2.30E-01	6.60E-02
CU-64	Not Detected	--------	2.80E+01
EU-152	Not Detected	--------	1.18E-01
EU-154	Not Detected	--------	2.19E-01
EU-155	Not Detected	--------	1.11E-01
FE-59	Not Detected	--------	9.05E-02
GD-153	Not Detected	--------	8.05E-02
HG-203	Not Detected	--------	3.60E-02
I-131	~~1.17E-02~~	~~1.19E-02~~	2.17E-02 not detected 3/17/96
IN-115m	Not Detected	--------	2.52
IR-192	Not Detected	--------	3.52E-02
K-40	1.79E+01	2.50	4.50E-01
LA-140	Not Detected	--------	6.39E-02
MN-52	Not Detected	--------	4.24E-02
MN-54	~~1.43E-02~~	~~1.94E-02~~	3.14E-02 not detected 3/17/96
MN-56	Not Detected	--------	1.34E+01
MO-99	Not Detected	--------	3.96E-01
NA-22	Not Detected	--------	5.39E-02
NA-24	Not Detected	--------	1.16E-01
NB-95	Not Detected	--------	2.54E-01
ND-147	Not Detected	--------	2.65E-01
NI-57	Not Detected	--------	9.30E-02
BE-07	Not Detected	--------	3.70E-01
RU-103	Not Detected	--------	3.90E-02
RU-106	Not Detected	--------	3.93E-01
SB-122	Not Detected	--------	6.56E-02
SB-124	Not Detected	--------	4.31E-02
SB-125	Not Detected	--------	1.19E-01
SC-46	Not Detected	--------	6.77E-02
SR-85	Not Detected	--------	5.07E-02
TA-182	Not Detected	--------	1.98E-01
TA-183	Not Detected	--------	1.73E-01
TE-132	Not Detected	--------	3.88E-02
TL-201	Not Detected	--------	1.09E-01
XE-133	Not Detected	--------	1.12E-01
Y-88	Not Detected	--------	3.99E-02
ZN-65	Not Detected	--------	1.32E-01
ZR-95	Not Detected	--------	7.25E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-15-96 2:55:48 PM *
****
* *Dept 7714 Survey No._____ *
* Reviewed by: 3/17/96 *Use Only Surveyed by:_____ *
****

Customer : M.YOUNG (7585)
Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
Lab Sample ID : 60021505

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 3-15-96 2:43:43 PM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:
****

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.31E+04
TH-234	Not Detected	--------	4.83E+03
RA-226	Not Detected	--------	6.48E+03
PB-214	Not Detected	--------	6.38E+02
BI-214	Not Detected	--------	6.21E+02
TH-232	Not Detected	--------	2.03E+03
RA-228	Not Detected	--------	2.87E+03
AC-228	Not Detected	--------	1.62E+03
TH-228	Not Detected	--------	4.71E+04
RA-224	Not Detected	--------	1.71E+03
PB-212	Not Detected	--------	3.39E+03
BI-212	Not Detected	--------	3.21E+04
TL-208	Not Detected	--------	6.56E+03
U-235	Not Detected	--------	1.79E+03
TH-231	Not Detected	--------	1.78E+04
PA-231	Not Detected	--------	1.39E+04
TH-227	Not Detected	--------	2.30E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.32E+03
PB-211	Not Detected	--------	1.19E+04
TL-207	Not Detected	--------	2.18E+05
AM-241	9.10E+04	1.58E+04	7.32E+03
PU-239	Not Detected	--------	3.37E+06
NP-237	Not Detected	--------	2.61E+03
PA-233	Not Detected	--------	5.86E+02
TH-229	Not Detected	--------	2.10E+03

[Summary Report] - Sample ID: 60021505

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	--------	3.50E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.55E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	2.50E+05	1.32E+05	1.98E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	4.52E+06
CE-141	Not Detected	--------	5.92E+20
CE-144	Not Detected	--------	2.20E+05
CO-56	Not Detected	--------	1.72E+10
CO-57	Not Detected	--------	3.82E+04
CO-58	Not Detected	--------	7.43E+10
CO-60	7.45E+04	9.71E+03	5.83E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	1.82E+03
CS-137	6.68E+04	8.65E+03	6.27E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.15E+03
EU-154	Not Detected	--------	2.35E+03
EU-155	Not Detected	--------	2.31E+03
FE-59	Not Detected	--------	1.65E+16
GD-153	Not Detected	--------	2.20E+05
HG-203	Not Detected	--------	1.22E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.74E+10
K-40	Not Detected	--------	1.70E+03
LA-140	Not Detected	--------	1.00E+26
MN-52	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	2.87E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	9.25E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	3.79E+14
RU-103	Not Detected	--------	3.53E+17
RU-106	Not Detected	--------	1.19E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	1.90E+12
SB-125	Not Detected	--------	4.16E+03
SC-46	Not Detected	--------	5.07E+09
SR-85	Not Detected	--------	4.36E+11
TA-182	Not Detected	--------	1.76E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	6.34E+07
ZN-65	Not Detected	--------	2.47E+05
ZR-95	Not Detected	--------	9.73E+11

****
*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program
* Quality Assurance Report
*
****

Report Date	:	3-15-96 2:58:31 PM
QA File	:	C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst	:	MEC
Sample ID	:	60021505
Sample Quantity	:	1.00 Each
Sample Date	:	11-01-90 12:00:00 PM
Measurement Date	:	3-15-96 2:43:43 PM
Elapsed Live Time	:	600 seconds
Elapsed Real Time	:	606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.302E-02	4.025E-03	9.099E-02	<	:	:	: >
CS-137 Activity	6.860E-02	2.071E-03	6.679E-02	<	:	:	: >
CO-60 Activity	7.512E-02	1.587E-03	7.339E-02	<	:In	:	: >

3/17/96

Flags Key:
- LU = Boundary Test (Ab = Above , Be = Below)
- SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
- UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
- BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 3/17/96

ER Site 58 DRT

Survey No. 3-96-0219

Radiation Protection Sample Diagnostics (7715) TA-III BLDG 6921

Smear Analysis

Date: 3/14/96

Counting Unit id: 1 (SNL# S674564)

Data file name: C:\LBXL\UNIT1\63005604.XLD

Batch Ended: 3/14/96 17:06

Crosstalk Correction: Applied

ANALYZED BY KILBANE

REVIEWED BY DPK

Alpha activity action level (DPM): 200.00

Beta activity action level (DPM): 1000.00

Certainty level for MDA and flags: 95.00%

High Voltage Setting: 1390

Application Revision: 3

Application Version: Standard

Batch ID: E.R. #580 RELEASE OF SAMPLES & EQUIPMENT 3-14-96 (KILBANE)

Alpha efficiency log file: pu238ab
Alpha Efficiency: 43.06%
Alpha to Beta Crosstalk: 10.98%
Alpha Background (CPM): 0.25
Alpha Correction Factor: 1.000

Beta efficiency log file: cl36eb
Beta Efficiency: 54.11%
Beta into Alpha Crosstalk: 0.85%
Beta Background (CPM): 2.65
Beta Correction Factor: 1.000

	Alpha Activity				Beta Activity				count	Alpha	Beta	Time
ID	DPM	σ	flags	MDA	DPM	σ	flags	MDA	Time	CPM	CPM	Compl
1	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	16:42
2	-0.68	2.69	<MDA	11.19	2.58	3.79	<MDA	15.18	1.00	-0.25	1.35	16:43
3	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	16:44
4	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	16:45
5	1.97	2.66	<MDA	10.84	-1.39	2.73	<MDA	15.41	1.00	0.75	-0.65	16:47
6	1.95	2.66	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	16:48
7	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	16:49
8	1.79	2.79	<MDA	12.04	13.54	5.95	<AL	15.40	1.00	0.75	7.35	16:50
9	-0.75	2.74	<MDA	11.64	8.17	4.99	<AL	15.18	1.00	-0.25	4.35	16:51
10	-0.68	2.69	<MDA	11.19	2.58	3.79	<MDA	15.18	1.00	-0.25	1.35	16:52
11	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	16:54
12	1.91	2.71	<MDA	11.32	4.21	4.23	<MDA	15.41	1.00	0.75	2.35	16:55
13	-0.77	2.75	<MDA	11.75	10.04	5.33	<AL	15.17	1.00	-0.25	5.35	16:56
14	7.04	4.62	<AL	11.87	11.22	5.65	<AL	15.84	1.00	2.75	6.35	16:57
15	-0.80	2.77	<MDA	11.92	11.91	5.65	<AL	15.17	1.00	-0.25	6.35	16:58
16	4.43	3.81	<AL	11.89	11.45	5.65	<AL	15.62	1.00	1.75	6.35	16:59
17	-0.68	2.69	<MDA	11.19	2.58	3.79	<MDA	15.18	1.00	-0.25	1.35	17:00
18	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	17:02
19	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	17:03
20	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	17:04
21	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	17:05
22	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	17:06

Mike Young
Site 58U

ER Site 58 DRT

Survey Number: 3-96-0219

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept. #	Date	Time	Duration
E.R. SITE #58U	1585	3-14-96	1500- 1730	N/A

Purpose	Request #	RWP #
RELEASE OF SAMPLES + EQUIPMENT	N/A	N/A

Instrument and Probe Type and Serial Number	Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP-260/#2355	JOHN P. Kilbane	John P Kilbane
BICRON MICRO REM # B216L		
TENNELEC LB-5100		

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. 20 /Isotope UNKNOWN				ALPHA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. N/A /Isotope N/A				RADIATION SURVEY Bkg. .008	
		cpm	Bkg. cpm	dpm/100 cm² (1)	(2) T/R/F	cpm	Bkg. cpm	dpm/100 cm² (1)	(2) T/R/F	mrem/hr (3)	Distance
1	SAMPLE BOTTLES - GROUP #027975	80	80	ND	T					<.02	CONTACT
2	#027981										
3	#027991										
4	#027976										
5	#027982										
6	#027977						N	A			
7	#027997										
8	#027983 + 027984										
9	#027990										
10	#027985										
11	#027986										
6	#027992										

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, if other than gamma (i.e. n or β).

Remarks:

Reviewed by:

RPOP-008.a

03/14/96 17:57 ☎505 845 3375 RAD PROT 7714 ☑002

Survey Number: 3-96-0219

ER Site 58DRT

RADIOLOGICAL SURVEY FORM CONTINUATION

Location: E.R. SITE #58U

Purpose: SAMPLES

Date: 3-14-96

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. 20 /Isotope UNKNOWN: cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	ALPHA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. N/A /Isotope N/A: cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	RADIATION SURVEY Bkg. .008: mrem/hr (3)	Distance
13	SAMPLE BOTTLES-GROUP #027973+027979	80	80	ND	T					<.02	CONTACT
14	#027987										
15	#027980										
16	#027968										
17	#027998										
18	#027993										
19	#027994										
20	#027996										
21	#027995					N	A				
22	(2) SMALL SHOVELS										
		N		N						N	A
		A		A							

RPOP-002,a
ver 950612

03/14/96 17:58 ☎505 845 3375 RAD PROT 7714 ☑003

UK1

Internal Lab Batch No. 600215

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AMIR-IN-HOUSE "RUSH"

PAGE 1 OF 1

AR/COC- 04955

DOE (6-95)

Dept. No./Mail Stop: 7585/1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No: 0155
Service Order No.: CF0180

Date Samples Shipped: 3/15/96
Carrier/Waybill No.: 4C
Lab Contact: AMIR MOHAGHEGHI
Lab Destination: AMIR
SMO Contact/Phone: Doug Salmi/848-0963
Send Report to SMO D. McLaughlin

Contract No.: A12480A
Case No.: 8835.110
SMO Authorization:

Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested: Gamma Spec

Location Tech Area III
Building ____ Room ____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
279788-02	58DRT-GR-004-0.0-SS	0.0	DRT 58	3-14-96 1335	Soil	Poly	500ml	4°c	G	SA	
279833-02	58DRT-GR-008-0.0-SS	0.0	58	1400	Soil	Poly	500ml	4°c	G	SA	
279888-02	58DRT-GR-012-0.0-SS	0.0	58	1425	Soil	Poly	500ml	4°c	G	SA	
279933-02	58DRT-GR-016-0.0-SS	0.0	58	1515	Soil	Poly	500ml	4°c	G	SA	

RMMA ☑ Yes ☐ No Ref. No. ____

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☑ Rush Required Report Date ____

Sample Tracking SMO USE
Date Entered (mm/dd/yy)
Entered by:
QC Inits:

Special Instructions/QC Requirements
- Please send "RUSH" Report to ED RANKIN - (SMO) - 844-4976 fax RICH KUTTENSTETTE -
- NEED 24 HR TURN-A-ROUND
This COC# 04955 will release COC# 04956 to GEL

Abnormal Conditions on Receipt LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciato	Concetta Cacciato	CC	Lamb/7584/284-3301
	Rod Nagel			IT/7554
	Jim Calvert	Jim Calvert	JC	Lamb/7584/284-3301

1. Relinquished by	Jim Calvert	Org. 7584	Date 3-15-96	Time 0932	4. Relinquished by	Org.	Date	Time
1. Received by		Org. SWL 7713	Date 3/15/96	Time 0932	4. Received by	Org.	Date	Time
2. Relinquished by		Org.	Date	Time	5. Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics AMIR-IN-HOUSE "RUSH"

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer This goes with COC# 04955

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 7585/1148 ms
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: _____
Suspect Isotopes: _____
Other Information: 04955

Hazards/Special Instructions:
Need "24 HOUR" Turnaround

Batch Log Number: 600215
Logged By: JMS

Analysis Type:
- [X] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login _____
Results Faxed _____
Sample Disposal _____

	Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
4	027978-02	Soil	3-14-96 1335	500 ml	Gamma Spec	01	<300	680	
8	027983-02	Soil	1400	500 ml	" "	02	<300	610	
12	027988-02	Soil	1425	500 ml	" "	03	<300	875	
16	027993-02	Soil	1510	500 ml	" "	04	<300	621	
	LCS	—	1200 3/20	—	γ spec	05	NA	NA	

Relinquished by Jim Calvert Date 3-15-96 Time 09:32 Received by _____ Date 3/15/96 Time 0932
Relinquished by _____ Date 3/18/96 Time 0950 Received by _____ Date 3/18/96 Time 0950
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, NM 87185-1093

date: March 18, 1996
to: D.L. McLaughlin, MS-0871 (7576)

from: K.A. Roberts, MS-1093 (7714)

subject: COC: 04955: Sample Number: 027978-02, 027983-02, 027988-02, 027993-02

The reference sample may be sent to General Engineering Laboratory without violating their Materials License with the State of South Carolina, License Number 13.

If you have any questions please contact me at 845-8227.

****
*** ACTIVITY REPORT ***
****

TRANSMISSION OK

TX/RX NO.	2657	
CONNECTION TEL		2842616
CONNECTION ID		
START TIME	03/19 09:29	
USAGE TIME	07'46	
PAGES	13	
RESULT	OK	

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 3

Internal Lab Batch No. _____

ER Site 58 Doppler Radar Test Site

AR/COC- 04956

SF-2001/COC/05-95

Dept. No./Mail Stop: 7585/1148
Project/Task Manager: Mike Young
Project Name: Faithful Test Area
Record Center Code: ER/1332/58/DRT
Logbook Ref No: 0155
Service Order No.: CF0180

Lab Contact: EDIE M. KENT
Lab Destination: GEL
SMO Contact/Phone: Doug Salmi/848-0963
Send Report to SMO D.McLaughlin

Contract No: DE-AC04-94AL85000
Case No: 8035.1.10
SMO Authorization:
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Parameter & Method Requested

Location — Tech Area III — Building _____ Room _____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Metals Gw 6010/7000 Series	Isotopic Uranium	Thorium	Cesium 137	HE Explosive	Lab Sample ID
✓ 027979-06	58DRT-GR-004-00-SS	0.0	58	3/7/96 1335	Soil	AG	250ml	4°C	G	SA	X					1
✓ 027979-08	58DRT-GR-004-00-SS	0.0	58	1335	Soil	AG	250ml	4°C	G	SA		X	X	X		2
✓ 027979-05	58DRT-GR-004-00-SS	0.0	58	1335	Soil	AG	250ml	4°C	G	SA					X	3
✓ 027984-06	58DRT-GR-008-00-SS	0.0	58	1400	Soil	AG	250ml	4°C	G	SA	X					1
✓ 027984-08	58DRT-GR-008-00-SS	0.0	58	1400	Soil	AG	250ml	4°C	G	SA		X	X	X		2
✓ 027984-05	58DRT-GR-008-00-SS	0.0	58	1400	Soil	AG	250ml	4°C	G	SA					X	3
✓ 027989-06	58DRT-GR-012-00-SS	0.0	58	1425	Soil	AG	250ml	4°C	G	SA	X					1
✓ 027989-08	58DRT-GR-012-00-SS	0.0	58	1425	Soil	AG	250ml	4°C	G	SA		X	X	X		2
✓ 027989-05	58DRT-GR-012-00-SS	0.0	58	1425	Soil	AG	250ml	4°C	G	SA					X	3
✓ 027995-06	58DRT-GR-016-00-SS	0.0	58	1510	Soil	AG	250ml	4°C	G	SA	X					1

Reference LOV (available at SMO)

Lab Sample ID: GW13313

RMMA ☑ Yes ☐ No Ref. No. _____

Sample Disposal ☑ Return to Client ☐ Disposal by lab

Turnaround Time ☑ Normal ☐ Rush Required Report Date _____

SMO USE

Special Instructions/QC Requirements
- Send report to Mike Young
- This coc # 04956 will be released to GEL by coc # 04955
- LIST AS Separate Report

LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciola	Concetta Cacciola	CC	Lamb/284/284-3301
	Rod Nagel	Rod Nagel	RN	IT/7584
	Jim Calhoun	Jim Calhoun	JC	Lamb/7584/284-3301

1. Relinquished by	Jim Calhoun	Org. 7584	Date 3-15-96	Time 10:25	4. Relinquished by	Org.	Date	Time
1. Received by	DJ McGaughnd	Org. SMO 7513	Date 3/15/96	Time 1025	4. Received by	Org.	Date	Time
2. Relinquished by	DJ McGaughnd	Org. SMO 7513	Date 3/18/96	Time 1400	5. Relinquished by	Org.	Date	Time
2. Received by	Doug Hubbard	Org. GEL	Date 3/19/96	Time 0900	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

05-07-1996 07:01 7661178 GENERAL ENGINEERING P.10

SF 2001-COD (9-94)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC-04956 1

ER Site 58 Doppler Radar Test Site

Project Name: Foothills Test Area Project/Task Manager: Mike Young Case No.: 8835.110

Location: Tech Area III Building ______ Room ______

Reference LOV (available at SMO)

Parameter & Method Requested

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Metals (ICP/GFAA) for TAL	Isotopic Uranium	Thorium	Cesium 137	HE Explosive					Lab Sample ID
027995-06	58DRT-GR-016-0.0-SSD	0.0	58	3-14-96 1510	Soil	AG	250ml	4°C	G	DU	X									.1
027995-08	58DRT-GR-016-0.0-SS	0.0	58	1510	Soil	AG	250ml	4°C	G	SA		X	X	X						.2
027996-08	58DRT-GR-016-0.0-SSD	0.0	58	1510	Soil	AG	250ml	4°C	G	DU		X	X	X						[illegible]
027995-05	58DRT-GR-016-0.0-SS	0.0	58	1510	Soil	AG	250ml	4°C	G	SA					X					.3
027996-05	58DRT-GR-016-0.0-SSD	0.0	58	1510	Soil	AG	250ml	4°C	G	DU					X					.3
027998-16	58DRT-GR-018-0.0-EB	0.0	58	1530	Water	Poly	500ml	HNO3	G	EB	X									.5
027998-18	58DRT-GR-018-0.0-EB	0.0	58	1530	Water	Poly	1L	HNO3	G	EB		X								.6
027998-19	58DRT-GR-018-0.0-EB	0.0	58	1530	Water	Poly	1L	HNO3	G	EB			X							[illegible]
027998-20	58DRT-GR-018-0.0-EB	0.0	58	1530	Water	Poly	2L	[illegible]	G	EB				X						.8
027998-15	58DRT-GR-018-0.0-EB	0.0	58	1530	Water	AG	1L 2X	4°C	G	EB					X					.7
027975-05	58DRT-GR-001-0.0-SS	0.0	58	1326	Soil	AG	250ml	4°C	G	SA					X					4
027976-05	58DRT-GR-002-0.0-SS	0.0	58	1330	Soil	AG	250ml	4°C	G	SA					X					
027977-05	58DRT-GR-003-0.0-SS	0.0	58	1332	Soil	AG	250ml	4°C	G	SA					X					
027980-05	58DRT-GR-005-0.0-SS	0.0	58	1348	Soil	AG	250ml	4°C	G	SA					X					
027981-05	58DRT-GR-006-0.0-SS	0.0	58	1351	Soil	AG	250ml	4°C	G	SA					X					
027982-05	58DRT-GR-007-0.0-SS	0.0	58	1354	Soil	AG	250ml	4°C	G	SA					X					
027985-05	58DRT-GR-009-0.0-SS	0.0	58	1415	Soil	AG	250ml	4°C	G	SA					X					
027986-05	58DRT-GR-010-0.0-SS	0.0	58	1418	Soil	AG	250ml	4°C	G	SA					X					

LAB USE

WHITE - To Accompany Samples, Laboratory Copy   BLUE - To Accompany Samples, Return to SMO   YELLOW - SMO Suspense Copy   PINK - Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

EP 1901-COD(9-94)

PAGE 3 OF 3

AR/COC- 04956

P.12

ER Site 58 Doppler Radar Test Site

Project Name: Foothills Test Area Project/Task Manager: Mike Young Case No.: 8835.110

Location Tech Area III

Building ____ Room ____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO) Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: HE Explosives	Lab Sample ID
✓ 02T98 7 - 05	58DRT-GR-011-0.0-SS	0.0	58	3-19-96 1420	Soil	PAG	250ml	4°C	G	SA	X	
✓ 02T99 0 - 05	58DRT-GR-013-0.0-SS	0.0	58	1448	Soil	PAG	250ml	4°C	G	SA	X	
✓ 02T99 1 - 05	58DRT-GR-014-0.0-SS	0.0	58	1455	Soil	PAG	250ml	4°C	G	SA	X	
✓ 02T99 2 - 05	58DRT-GR-015-0.0-SS	0.0	58	1500	Soil	PAG	250ml	4°C	G	SA	X	
✓ 02T99 7 - 05	58DRT-GR-017-0.0-SS	0.0	58	1505	Soil	PAG	250ml	4°C	G	SA	X	

LAB USE

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

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05-07-1996 07:03

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: April 15, 1996

Sample ID : 027979-08 58DRT-GR-004-0.0-SS
Lab ID : 9603313-02
Matrix : SOIL
Date Collected : 03/14/96
Date Received : 03/19/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.06	+/- 0.206	.04	0.109	pCi/g	1.0	TLN	04/08/96	1026	82082	1
Thorium-230	B	0.845	+/- 0.175	.04	0.0622	pCi/g	1.0					
Thorium-232	B	0.998	+/- 0.192	.04	0.0547	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.713	+/- 0.113	.09	0.0468	pCi/g	1.0	PEM	04/10/96	1730	82081	2
Uranium-235	UB	0.0574	+/- 0.0339	.09	0.0451	pCi/g	1.0					
Uranium-238	B	0.684	+/- 0.112	.09	0.0656	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228		1.15	+/- 0.182	1	0.134	pCi/g	1.0	SCM	04/03/96	0832	82046	1
Americium-241	U	-0.0248	+/- 0.101	2	0.160	pCi/g	1.0					
Cerium-144	U	0.0250	+/- 0.115	.5	0.201	pCi/g	1.0					
Cesium-134	U	0.00603	+/- 0.0216	.1	0.0345	pCi/g	1.0					
Cesium-137		2.06	+/- 0.0956	.04	0.0397	pCi/g	1.0					
Chromium-51	U	0.0686	+/- 0.256	1	0.436	pCi/g	1.0					
Cobalt-60	U	-0.00409	+/- 0.0224	.1	0.0404	pCi/g	1.0					
Iron-59	U	-0.00550	+/- 0.0562	1	0.0965	pCi/g	1.0					
Lead-212		1.21	+/- 0.0742	1	0.0565	pCi/g	1.0					
Lead-214		1.15	+/- 0.0988	1	0.0741	pCi/g	1.0					
Potassium-40		20.6	+/- 1.1	1	0.370	pCi/g	1.0					
Radium-226	U	0.910	+/- 0.111	1	0.0737	pCi/g	1.0					
Radium-228		1.15	+/- 0.182	1	0.134	pCi/g	1.0					
Ruthenium-103	U	-0.00548	+/- 0.0281	1	0.0494	pCi/g	1.0					
Ruthenium-106	U	-0.204	+/- 0.196	.8	0.324	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.209	pCi/g	1.0					
Thorium-232	U	1.18	+/- 0.0727	2	0.0554	pCi/g	1.0					
Thorium-234	UB	0.918	+/- 1.45	5	1.34	pCi/g	1.0					
Uranium-235	U	-0.0210	+/- 0.114	1	0.196	pCi/g	1.0					

97

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Client: Sandia National Laboratories
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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027979-08 58DRT-GR-004-0.0-SS

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.918	+/- 1.45	5	1.34	pCi/g	1.0					
Zirconium-95	U	0.0438	+/- 0.0437	1	0.0822	pCi/g	1.0	SCM	04/03/96	0832	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027979-08 58DRT-GR-004-0.0-SS

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: April 15, 1996

Sample ID : 027984-08 58DRT-GR-008-0.0-SS
Lab ID : 9603313-05
Matrix : SOIL
Date Collected : 03/14/96
Date Received : 03/19/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.23	+/- 0.167	.04	0.0634	pCi/g	1.0	TLN	04/08/96	1026	82082	1
Thorium-230	B	1.01	+/- 0.144	.04	0.0114	pCi/g	1.0					
Thorium-232	B	1.16	+/- 0.157	.04	0.0114	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.802	+/- 0.118	.09	0.0104	pCi/g	1.0	PEM	04/10/96	1730	82081	2
Uranium-235	UB	0.0138	+/- 0.0163	.09	0.0266	pCi/g	1.0					
Uranium-238	B	0.746	+/- 0.113	.09	0.0104	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228		1.22	+/- 0.186	1	0.139	pCi/g	1.0	SCM	04/03/96	0836	82046	1
Americium-241	U	0.0397	+/- 0.092	2	0.161	pCi/g	1.0					
Cerium-144	U	-0.0349	+/- 0.134	.5	0.224	pCi/g	1.0					
Cesium-134	U	-0.00845	+/- 0.0256	.1	0.0377	pCi/g	1.0					
Cesium-137		1.78	+/- 0.0907	.04	0.0469	pCi/g	1.0					
Chromium-51	U	-0.303	+/- 0.267	1	0.447	pCi/g	1.0					
Cobalt-60	U	-0.0168	+/- 0.0257	.1	0.0431	pCi/g	1.0					
Iron-59	U	-0.0239	+/- 0.0654	1	0.113	pCi/g	1.0					
Lead-212		1.33	+/- 0.0778	1	0.0605	pCi/g	1.0					
Lead-214		1.20	+/- 0.123	1	0.0769	pCi/g	1.0					
Potassium-40		20.6	+/- 1.15	1	0.404	pCi/g	1.0					
Radium-226		1.16	+/- 0.12	1	0.0753	pCi/g	1.0					
Radium-228		1.22	+/- 0.186	1	0.139	pCi/g	1.0					
Ruthenium-103	U	0.00506	+/- 0.0305	1	0.0534	pCi/g	1.0					
Ruthenium-106	U	-0.0858	+/- 0.208	.8	0.350	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.194	pCi/g	1.0					
Thorium-232	U	1.31	+/- 0.0763	2	0.0593	pCi/g	1.0					
Thorium-234	UB	0.888	+/- 1.19	5	1.35	pCi/g	1.0					
Uranium-235	U	0.104	+/- 0.133	1	0.229	pCi/g	1.0					

100

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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027984-08 58DRT-GR-008-0.0-SS

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.888	+/- 1.19	5	1.35	pCi/g	1.0					
Zirconium-95	U	0.0419	+/- 0.0475	1	0.0872	pCi/g	1.0	SCM	04/03/96	0836	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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Client: Sandia National Laboratories
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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027984-08 58DRT-GR-008-0.0-SS

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: April 15, 1996

Sample ID	: 027989-08 58DRT-GR-012-0.0-SS
Lab ID	: 9603313-08
Matrix	: SOIL
Date Collected	: 03/14/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		0.948	+/- 0.152	.04	0.0484	pCi/g	1.0	TLN	04/08/96	1026	82082	1
Thorium-230	B	0.802	+/- 0.135	.04	0.0286	pCi/g	1.0					
Thorium-232	B	0.970	+/- 0.152	.04	0.0286	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.527	+/- 0.0913	.09	0.0290	pCi/g	1.0	PEM	04/10/96	1730	82081	2
Uranium-235	UB	0.0350	+/- 0.0225	.09	0.0210	pCi/g	1.0					
Uranium-238	B	0.526	+/- 0.0906	.09	0.00998	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228		1.06	+/- 0.258	1	0.177	pCi/g	1.0	SCM	04/03/96	0848	82046	1
Americium-241	U	-0.0199	+/- 0.136	2	0.200	pCi/g	1.0					
Cerium-144	U	0.0235	+/- 0.145	.5	0.254	pCi/g	1.0					
Cesium-134	U	-0.00947	+/- 0.0293	.1	0.0446	pCi/g	1.0					
Cesium-137		0.218	+/- 0.075	.04	0.0513	pCi/g	1.0					
Chromium-51	U	-0.142	+/- 0.323	1	0.534	pCi/g	1.0					
Cobalt-60	U	-0.00645	+/- 0.0318	.1	0.0576	pCi/g	1.0					
Iron-59	U	0.00586	+/- 0.0816	1	0.143	pCi/g	1.0					
Lead-212		1.01	+/- 0.11	1	0.0665	pCi/g	1.0					
Lead-214	U	0.818	+/- 0.143	1	0.0883	pCi/g	1.0					
Potassium-40		20.2	+/- 1.52	1	0.540	pCi/g	1.0					
Radium-226	U	0.771	+/- 0.147	1	0.0966	pCi/g	1.0					
Radium-228		1.06	+/- 0.258	1	0.177	pCi/g	1.0					
Ruthenium-103	U	0.0128	+/- 0.0351	1	0.0644	pCi/g	1.0					
Ruthenium-106	U	0.0410	+/- 0.238	.8	0.432	pCi/g	1.0					
Thorium-231	U	0.0238	+/- 0.14	1	0.239	pCi/g	1.0					
Thorium-232	U	0.988	+/- 0.108	2	0.0652	pCi/g	1.0					
Thorium-234	UB	1.08	+/- 2.11	5	1.66	pCi/g	1.0					
Uranium-235	U	0.135	+/- 0.15	1	0.268	pCi/g	1.0					

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Client: Sandia National Laboratories
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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027989-08 58DRT-GR-012-0.0-SS

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	1.08	+/- 2.11	5	1.66	pCi/g	1.0					
Zirconium-95	U	0.0521	+/- 0.0599	1	0.113	pCi/g	1.0	SCM	04/03/96	0848	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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Client:	Sandia National Laboratories
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Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027989-08 58DRT-GR-012-0.0-SS

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Client: Sandia National Laboratories
PO Box 5800
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Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: April 15, 1996

Sample ID : 027995-08 58DRT-GR-016-0.0-SS
Lab ID : 9603313-12
Matrix : SOIL
Date Collected : 03/14/96
Date Received : 03/19/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.12	+/- 0.192	.04	0.114	pCi/g	1.0	TLN	04/08/96	2120	82082	1
Thorium-230	B	1.02	+/- 0.173	.04	0.0351	pCi/g	1.0					
Thorium-232	B	1.05	+/- 0.176	.04	0.0167	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.798	+/- 0.109	.09	0.0251	pCi/g	1.0	PEM	04/10/96	1730	82081	2
Uranium-235	UB	0.0245	+/- 0.0176	.09	0.0182	pCi/g	1.0					
Uranium-238	B	0.818	+/- 0.111	.09	0.0251	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228		1.24	+/- 0.2	1	0.129	pCi/g	1.0	SCM	04/03/96	1949	82046	1
Americium-241	U	0.0315	+/- 0.103	2	0.168	pCi/g	1.0					
Cerium-144	U	-0.00602	+/- 0.127	.5	0.220	pCi/g	1.0					
Cesium-134	U	-0.0340	+/- 0.0221	.1	0.0356	pCi/g	1.0					
Cesium-137		1.39	+/- 0.0778	.04	0.0356	pCi/g	1.0					
Chromium-51	U	0.147	+/- 0.269	1	0.467	pCi/g	1.0					
Cobalt-60	U	0.0145	+/- 0.0225	.1	0.0442	pCi/g	1.0					
Iron-59	U	0.00931	+/- 0.0636	1	0.112	pCi/g	1.0					
Lead-212		1.33	+/- 0.0816	1	0.0625	pCi/g	1.0					
Lead-214		1.16	+/- 0.12	1	0.0711	pCi/g	1.0					
Potassium-40		20.9	+/- 1.13	1	0.365	pCi/g	1.0					
Radium-226	U	0.997	+/- 0.115	1	0.0689	pCi/g	1.0					
Radium-228		1.24	+/- 0.2	1	0.129	pCi/g	1.0					
Ruthenium-103	U	-0.0208	+/- 0.0262	1	0.0448	pCi/g	1.0					
Ruthenium-106	U	-0.0573	+/- 0.183	.8	0.318	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.191	pCi/g	1.0					
Thorium-232	U	1.31	+/- 0.0799	2	0.0612	pCi/g	1.0					
Thorium-234	UB	0.291	+/- 1.23	5	1.41	pCi/g	1.0					
Uranium-235	U	0.0372	+/- 0.229	1	0.217	pCi/g	1.0					

106

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027995-08 58DRT-GR-016-0.0-SS

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	0.291	+/- 1.23	5	1.41	pCi/g	1.0					
Zirconium-95	U	-0.00266	+/- 0.0449	1	0.0788	pCi/g	1.0	SCM	04/03/96	1949	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027995-08 58DRT-GR-016-0.0-SS

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

9603313-12 P O Box 30712 • Charleston, SC 29417 • (803) 556-8171 • Fax (803) 766-1178

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID	: 027996-08 58DRT-GR-016-0.0-SSD
Lab ID	: 9603313-13
Matrix	: SOIL
Date Collected	: 03/14/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.14	+/- 0.188	.04	0.0833	pCi/g	1.0	TLN	04/08/96	2120	82082	1
Thorium-230	B	0.959	+/- 0.164	.04	0.0333	pCi/g	1.0					
Thorium-232	B	1.11	+/- 0.18	.04	0.0405	pCi/g	1.0					
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	0.694	+/- 0.103	.09	0.0295	pCi/g	1.0	PEM	04/10/96	1730	82081	2
Uranium-235	UB	0.0415	+/- 0.0234	.09	0.0194	pCi/g	1.0					
Uranium-238	B	0.744	+/- 0.107	.09	0.0193	pCi/g	1.0					
Gamma PHA - 21 items												
Actinium-228		1.34	+/- 0.219	1	0.144	pCi/g	1.0	SCM	04/03/96	2009	82046	1
Americium-241	U	0.0112	+/- 0.104	2	0.175	pCi/g	1.0					
Cerium-144	U	-0.0386	+/- 0.148	.5	0.242	pCi/g	1.0					
Cesium-134	U	-0.00805	+/- 0.0243	.1	0.0349	pCi/g	1.0					
Cesium-137		1.60	+/- 0.085	.04	0.0407	pCi/g	1.0					
Chromium-51	U	0.175	+/- 0.281	1	0.497	pCi/g	1.0					
Cobalt-60	U	0.0249	+/- 0.0373	.1	0.0466	pCi/g	1.0					
Iron-59	U	-0.0207	+/- 0.0687	1	0.117	pCi/g	1.0					
Lead-212		1.33	+/- 0.0902	1	0.0663	pCi/g	1.0					
Lead-214		1.20	+/- 0.122	1	0.0817	pCi/g	1.0					
Potassium-40		22.3	+/- 1.14	1	0.358	pCi/g	1.0					
Radium-226	U	0.999	+/- 0.103	1	0.0728	pCi/g	1.0					
Radium-228		1.34	+/- 0.219	1	0.144	pCi/g	1.0					
Ruthenium-103	U	-0.0235	+/- 0.0308	1	0.0503	pCi/g	1.0					
Ruthenium-106	U	0.208	+/- 0.205	.8	0.371	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.252	pCi/g	1.0					
Thorium-232	U	1.31	+/- 0.0884	2	0.0650	pCi/g	1.0					
Thorium-234	UB	1.74	+/- 1.6	5	1.40	pCi/g	1.0					
Uranium-235	U	0.0912	+/- 0.151	1	0.253	pCi/g	1.0					

109

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027996-08 58DRT-GR-016-0.0-SSD

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Uranium-238	UB	1.74	+/- 1.6	5	1.40	pCi/g	1.0					
Zirconium-95	U	-0.00545	+/- 0.046	1	0.0813	pCi/g	1.0	SCM	04/03/96	2009	82046	1

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300
M 2	EPI A-011B

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417

9603313-13

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 15, 1996

Sample ID : 027996-08 58DRT-GR-016-0.0-SSD

GEL Laboratory Certifications		EPI Laboratory Certifications	
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 09, 1996

Sample ID	: 027998-18 58DRT-GR-018-0.0-EB
Lab ID	: 9603313-17
Matrix	: AQUEOUS
Date Collected	: 03/14/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst Date	Time	Batch	M
Radiological											
Alpha Spectroscopy Uranium - 3 items											
Uranium-233/234	U	0.101	+/- 0.0625	.15	0.0746	pCi/L	1.0	ADW 04/05/96	1159	82697	1
Uranium-235	U	0.0311	+/- 0.0366	.15	0.0597	pCi/L	1.0				
Uranium-238	UB	0.0115	+/- 0.0301	.15	0.0677	pCi/L	1.0				

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	EPI A-011

GEL Laboratory Certifications **EPI Laboratory Certifications**

112

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 09, 1996

Sample ID : 027998-18 58DRT-GR-018-0.0-EB

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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GENERAL ENGINEERING LABORATORIES

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 18, 1996

Sample ID	: 027998-19 58DRT-GR-018-0.0-EB
Lab ID	: 9603313-18
Matrix	: AQUEOUS
Date Collected	: 03/14/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228	U	-0.0574	+/- 0.0493	.15	0.239	pCi/L	1.0	PCW	04/17/96	0822	82936	1
Thorium-230	U	0.111	+/- 0.0938	.15	0.0897	pCi/L	1.0					
Thorium-232	U	-0.00266	+/- 0.00532	.15	0.0897	pCi/L	1.0					

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	EPI A-012

GEL Laboratory Certifications **EPI Laboratory Certifications**

114

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: April 18, 1996

Sample ID : 027998-19 58DRT-GR-018-0.0-EB

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: April 02, 1996

Sample ID	: 027998-20 58DRT-GR-018-0.0-EB
Lab ID	: 9603313-19
Matrix	: AQUEOUS
Date Collected	: 03/14/96
Date Received	: 03/19/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Gamma PHA - 21 items												
Actinium-228	U	5.87	+/- 11.6	30	15.2	pCi/L	1.0	SCM	03/29/96	1223	82448	1
Americium-241	U	0.721	+/- 11	100	18.1	pCi/L	1.0					
Cerium-144	U	-5.54	+/- 13.2	60	22.8	pCi/L	1.0					
Cesium-134	U	0.0195	+/- 1.96	10	3.58	pCi/L	1.0					
Cesium-137	U	0.589	+/- 2.05	10	3.87	pCi/L	1.0					
Chromium-51	U	-7.15	+/- 22.1	30	37.3	pCi/L	1.0					
Cobalt-60	U	0.124	+/- 1.9	10	3.71	pCi/L	1.0					
Iron-59	U	1.13	+/- 3.76	10	7.35	pCi/L	1.0					
Lead-212	U	3.90	+/- 5.5	15	6.88	pCi/L	1.0					
Lead-214	U	0.619	+/- 4.71	10	8.15	pCi/L	1.0					
Potassium-40	UB	29.8	+/- 47.4	110	31.4	pCi/L	1.0					
Radium-226	U	5.40	+/- 4.42	6.34	8.79	pCi/L	1.0					
Radium-228	U	5.87	+/- 11.6	15	15.2	pCi/L	1.0					
Ruthenium-103	U	-1.10	+/- 2.14	10	3.78	pCi/L	1.0					
Ruthenium-106	U	-1.69	+/- 15.9	90	29.2	pCi/L	1.0					
Thorium-231	U	0.280	+/- 10.2	15	17.7	pCi/L	1.0					
Thorium-232	U	3.84	+/- 5.42	15	5.26	pCi/L	1.0					
Thorium-234	U	48.3	+/- 97.1	350	163	pCi/L	1.0					
Uranium-235	U	12.0	+/- 14.4	21.5	24.0	pCi/L	1.0					
Uranium-238	U	48.3	+/- 97.1	500	163	pCi/L	1.0					
Zirconium-95	U	1.88	+/- 3.73	10	6.78	pCi/L	1.0					

Comments:

DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

116

GENERAL ENGINEERING LABORATORIES

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CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 02, 1996

Sample ID : 027998-20 58DRT-GR-018-0.0-EB

M = Method	Method-Description
M 1	EPI A-013

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: April 02, 1996

Sample ID : 027998-20 58DRT-GR-018-0.0-EB

GEL Laboratory Certifications **EPI Laboratory Certifications**

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

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Feature 58X

ER Site 58X IN-HOUSE

Internal Lab Batch No. 600594

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC- 05083

F 2001-COC (6-95)

Dept. No./Mail Stop: 7585/ms1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No: 0155
Service Order No.: CF0180

Date Samples Shipped: 5/7/96 (SMO USE)
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: RPSD Building 881
SMO Contact/Phone: Doug Salmi/848-0963
Send Report to SMO: Kathy Becker

Contract No.: N/A
Case No.: 362400
SMO Authorization:
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Parameter & Method Requested: Gamma SPEC.

Location Tech Area III
Building N/A Room N/A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
029244-02	58X-GR-001-.5'-SS	.5'	58	5/6/96 1020	Soil	Poly	500	none	G	SA	
029245-02	58X-GR-001-.5'-SSD	.5'	58		Soil	Poly	500	none	G	SA	
029246-02	58X-GR-002-.5'-SS	.5'	58	5/6/96 1024	Soil	Poly	500	none	G	SA	
029247-02	58X-GR-003-.5'-SS	.5'	58	1030	Soil	Poly	500	none	G	SA	
029248-02	58X-GR-004-.5'-SS	.5'	58	1032	Soil	Poly	500	none	G	SA	
029250-02	58X-GR-006-.5'-SS	.5'	58	1041	Soil	Poly	500	none	G	SA	
029251-02	58X-GR-007-.5'-SS	.5'	58	1051	Soil	Poly	500	none	G	SA	
029252-02	58X-GR-008-.5'-SS	.5'	58	1054	Soil	Poly	500	none	G	SA	
029253-02	58X-GR-009-.5'-SS	.5'	58	1100	Soil	Poly	500	none	G	SA	
029255-02	58X-GR-011-.5'-SS	.5'	58	1108	Soil	Poly	500	none	G	SA	

(LAB USE)

RMMA ■ Yes ☐ No Ref. No. ____

Sample Disposal ■ Return to Client ☐ Disposal by lab

Turnaround Time ■ Normal ☐ Rush Required Report Date ____

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ____
Entered by: ____
QC inits. ____

Special Instructions/QC Requirements
- Please send a separat report to Mike Young

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciato	Concetta Cacciato	CC	Lamb/7584/284-3301
	Karen DeWees	Karen DeWees	KD	" " "

1. Relinquished by		Org. 7584	Date 5/7/96	Time 835	4. Relinquished by	Org.	Date	Time
1. Received by		Org. 7513	Date 5/7/96	Time 835	4. Received by	Org.	Date	Time
2. Relinquished by		Org. 7513	Date 5/7/96	Time 845	5. Relinquished by	Org.	Date	Time
2. Received by		Org. SNL7713	Date 5/7/96	Time 0845	5. Received by	Org.	Date	Time
3. Relinquished by		Org. 7713	Date 5/14/96	Time 1000	6. Relinquished by	Org.	Date	Time
3. Received by		Org. 7513	Date 5/14/96	Time 1000	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

AR/COC- 05083

BATCH # 600594

Project Name: Foothills Test Area Project/Task Manager: Mike Young Case No.: 3622.400

Location Tech Area III

Building N/A Room N/A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Parameter & Method Requested	Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec.	
029256-02	58X-GR-012-.5'-SS	.5'	58	5/6/96 1110	Soil	Poly	500	none	G	SA	X	
029257-02	58X-GR-013-.5'-SS	.5'	58	1117	Soil	Poly	500	none	G	SA	X	
029258-02	58X-GR-014-.5'-SS	.5'	58	1118	Soil	Poly	500	none	G	SA	X	
029260-02	58X-GR-016-.5'-SS	.5'	58	1126	Soil	Poly	500	none	G	SA	X	
029263-02	58X-GR-016-EB	—	58	1315 1305	DIW	Poly	500	none	G	EB	X	LAB
029264-02	58X-GR-016-FB	—	58	(RD) 1315 (RD) 1300	DIW	Poly	500	none	G	FB	X	USE
029265-02	58X-GR-017-.5-SS	.5'	58	1355	Soil	Poly	500	none	G	SA	X	

Abnormal Conditions on Receipt

LAB USE

Recipient Initials

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

****
*
*
*
****

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

5-10-96 8:48:48 AM

****
*
* Analyzed by: 5/13/96 Reviewed by: 5-13/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029244-02
Lab Sample ID : 60059401

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 856.000 gram
Sample Date/Time : 5-06-96 10:20:00 AM
Acquire Start Date : 5-10-96 6:59:38 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	6.55	2.79	3.54
TH-234	7.87	1.58	5.89E-01
RA-226	Not Detected	--------	8.98E-01
PB-214	6.03E-01	9.72E-02	5.45E-02
BI-214	5.23E-01	8.65E-02	4.86E-02
TH-232	9.72E-01	4.57E-01	2.29E-01
RA-228	1.01	2.04E-01	1.21E-01
AC-228	8.79E-01	1.61E-01	1.00E-01
TH-228	5.87E-01	2.04E-01	4.22E-01
RA-224	9.57E-01	2.35E-01	7.96E-02
PB-212	8.04E-01	1.34E-01	3.76E-02
BI-212	8.51E-01	4.06E-01	6.00E-01
TL-208	7.61E-01	1.32E-01	1.07E-01
U-235	3.78E-01	1.96E-01	2.96E-01
TH-231	Not Detected	--------	2.94
PA-231	Not Detected	--------	1.32
TH-227	Not Detected	--------	3.37E-01
RA-223	Not Detected	--------	2.45E-01
RN-219	Not Detected	--------	3.45E-01
PB-211	Not Detected	--------	7.99E-01
TL-207	Not Detected	--------	1.20E+01
AM-241	Not Detected	--------	5.61E-01
PU-239	Not Detected	--------	3.36E+02
NP-237	Not Detected	--------	2.98E-01
PA-233	Not Detected	--------	5.27E-02
TH-229	Not Detected	--------	2.96E-01

[Summary Report] - Sample ID: 60059401

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.76E-02
AG-110m	Not Detected	--------	3.68E-02
AR-41	Not Detected	--------	9.09E+13
BA-133	Not Detected	--------	5.37E-02
BA-140	Not Detected	--------	1.15E-01
CD-109	Not Detected	--------	1.03
CD-115	Not Detected	--------	2.02E-01
CE-139	Not Detected	--------	3.05E-02
CE-141	Not Detected	--------	5.98E-02
CE-144	Not Detected	--------	2.35E-01
CO-56	Not Detected	--------	3.03E-02
CO-57	Not Detected	--------	3.19E-02
CO-58	Not Detected	--------	2.89E-02
CO-60	Not Detected	--------	3.38E-02
CR-51	Not Detected	--------	2.28E-01
CS-134	Not Detected	--------	4.35E-02
CS-137	1.08E-01	2.47E-02	2.68E-02
CU-64	Not Detected	--------	1.07E+03
EU-152	Not Detected	--------	8.04E-02
EU-154	Not Detected	--------	1.70E-01
EU-155	Not Detected	--------	1.22E-01
FE-59	Not Detected	--------	6.79E-02
GD-153	Not Detected	--------	1.22E-01
HG-203	Not Detected	--------	2.77E-02
I-131	Not Detected	--------	3.43E-02
IN-115m	Not Detected	--------	1.14E+05
IR-192	Not Detected	--------	2.54E-02
K-40	1.79E+01	2.42	2.73E-01
LA-140	Not Detected	--------	1.50E-01
MN-54	Not Detected	--------	3.08E-02
MN-56	Not Detected	--------	2.40E+09
MO-99	Not Detected	--------	5.97E-01
NA-22	Not Detected	--------	3.59E-02
NA-24	Not Detected	--------	2.28
NB-95	Not Detected	--------	3.30E-01
ND-147	Not Detected	--------	2.18E-01
NI-57	Not Detected	--------	2.65E-01
BE-07	Not Detected	--------	2.39E-01
RU-103	Not Detected	--------	2.67E-02
RU-106	Not Detected	--------	2.55E-01
SB-122	Not Detected	--------	9.99E-02
SB-124	Not Detected	--------	2.92E-02
SB-125	Not Detected	--------	7.48E-02
SC-46	Not Detected	--------	4.68E-02
SR-85	Not Detected	--------	3.43E-02
TA-182	Not Detected	--------	1.36E-01
TA-183	Not Detected	--------	8.23E-01
TE-132	Not Detected	--------	5.81E-02
TL-201	Not Detected	--------	3.95E-01
V-48	Not Detected	--------	3.47E-02
XE-133	Not Detected	--------	4.54E-01
Y-88	Not Detected	--------	2.41E-02
ZN-65	Not Detected	--------	8.98E-02
ZR-95	Not Detected	--------	5.31E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-10-96 10:57:30 AM *
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* Analyzed by: 5/13/96 Reviewed by: 5/13/96 *
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Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029246-02
Lab Sample ID : 60059402

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 843.000 gram
Sample Date/Time : 5-06-96 10:24:00 AM
Acquire Start Date : 5-10-96 9:13:46 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	3.94	3.00	4.55
TH-234	6.00	1.25	5.76E-01
RA-226	1.59	1.05	8.91E-01
PB-214	6.46E-01	1.05E-01	6.38E-02
BI-214	5.93E-01	9.54E-02	4.59E-02
TH-232	7.68E-01	3.58E-01	1.56E-01
RA-228	9.06E-01	1.86E-01	1.24E-01
AC-228	7.81E-01	1.45E-01	9.10E-02
TH-228	8.46E-01	2.45E-01	4.22E-01
RA-224	9.13E-01	2.24E-01	6.57E-02
PB-212	8.58E-01	1.47E-01	3.55E-02
BI-212	8.14E-01	3.35E-01	4.76E-01
TL-208	7.84E-01	1.29E-01	8.64E-02
U-235	2.54E-01	9.83E-02	1.38E-01
TH-231	Not Detected	--------	2.84
PA-231	Not Detected	--------	1.34
TH-227	Not Detected	--------	3.42E-01
RA-223	Not Detected	--------	2.40E-01
RN-219	Not Detected	--------	3.68E-01
PB-211	Not Detected	--------	8.48E-01
TL-207	Not Detected	--------	1.25E+01
AM-241	Not Detected	--------	5.48E-01
PU-239	Not Detected	--------	2.60E+02
NP-237	Not Detected	--------	2.91E-01
PA-233	Not Detected	--------	5.49E-02
TH-229	Not Detected	--------	2.88E-01

[Summary Report] - Sample ID: 60059402

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.77E-02
AG-110m	Not Detected	--------	5.34E-02
AR-41	Not Detected	--------	1.97E+14
BA-133	Not Detected	--------	5.55E-02
BA-140	Not Detected	--------	1.20E-01
CD-109	Not Detected	--------	1.01
CD-115	Not Detected	--------	2.11E-01
CE-139	Not Detected	--------	3.00E-02
CE-141	Not Detected	--------	5.99E-02
CE-144	Not Detected	--------	2.37E-01
CO-56	Not Detected	--------	3.13E-02
CO-57	Not Detected	--------	3.18E-02
CO-58	Not Detected	--------	2.90E-02
CO-60	Not Detected	--------	3.24E-02
CR-51	Not Detected	--------	2.34E-01
CS-134	Not Detected	--------	4.49E-02
CS-137	3.96E-01	6.33E-02	1.97E-02
CU-64	Not Detected	--------	1.13E+03
EU-152	Not Detected	--------	8.34E-02
EU-154	Not Detected	--------	1.71E-01
EU-155	Not Detected	--------	1.41E-01
FE-59	Not Detected	--------	6.71E-02
GD-153	Not Detected	--------	1.19E-01
HG-203	Not Detected	--------	2.85E-02
I-131	Not Detected	--------	3.52E-02
IN-115m	Not Detected	--------	1.62E+05
IR-192	Not Detected	--------	2.68E-02
K-40	1.77E+01	2.40	2.84E-01
LA-140	Not Detected	--------	1.63E-01
MN-54	Not Detected	--------	3.16E-02
MN-56	Not Detected	--------	4.43E+09
MO-99	Not Detected	--------	6.34E-01
NA-22	Not Detected	--------	3.71E-02
NA-24	Not Detected	--------	2.49
NB-95	Not Detected	--------	3.40E-01
ND-147	Not Detected	--------	2.36E-01
NI-57	Not Detected	--------	2.64E-01
BE-07	Not Detected	--------	2.43E-01
RU-103	Not Detected	--------	2.70E-02
RU-106	Not Detected	--------	2.62E-01
SB-122	Not Detected	--------	1.02E-01
SB-124	Not Detected	--------	2.97E-02
SB-125	Not Detected	--------	8.09E-02
SC-46	Not Detected	--------	4.63E-02
SR-85	Not Detected	--------	3.52E-02
TA-182	Not Detected	--------	1.36E-01
TA-183	Not Detected	--------	8.13E-01
TE-132	Not Detected	--------	6.17E-02
TL-201	Not Detected	--------	4.03E-01
V-48	Not Detected	--------	3.79E-02
XE-133	Not Detected	--------	4.43E-01
Y-88	Not Detected	--------	2.71E-02
ZN-65	Not Detected	--------	8.97E-02
ZR-95	Not Detected	--------	5.48E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-10-96 12:45:59 PM *
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* Analyzed by: 5/13/96 Reviewed by: 5/13/96 *
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Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029247-02
Lab Sample ID : 60059403

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 764.000 gram
Sample Date/Time : 5-06-96 10:30:00 AM
Acquire Start Date : 5-10-96 11:03:09 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	2.95	2.52	3.87
TH-234	3.13	7.47E-01	5.62E-01
RA-226	Not Detected	--------	6.20E-01
PB-214	6.51E-01	1.06E-01	6.38E-02
BI-214	6.37E-01	1.10E-01	8.01E-02
TH-232	9.05E-01	4.23E-01	1.97E-01
RA-228	9.52E-01	1.86E-01	1.42E-01
AC-228	9.24E-01	1.82E-01	1.46E-01
TH-228	8.98E-01	2.59E-01	4.38E-01
RA-224	9.52E-01	2.35E-01	7.10E-02
PB-212	9.07E-01	1.50E-01	3.89E-02
BI-212	9.40E-01	3.19E-01	4.21E-01
TL-208	8.42E-01	1.37E-01	8.56E-02
U-235	1.44E-01	1.46E-01	2.34E-01
TH-231	Not Detected	--------	2.91
PA-231	Not Detected	--------	1.38
TH-227	Not Detected	--------	3.68E-01
RA-223	Not Detected	--------	2.44E-01
RN-219	Not Detected	--------	3.83E-01
PB-211	Not Detected	--------	8.76E-01
TL-207	Not Detected	--------	1.35E+01
AM-241	Not Detected	--------	5.37E-01
PU-239	Not Detected	--------	4.51E+02
NP-237	Not Detected	--------	2.88E-01
PA-233	Not Detected	--------	5.72E-02
TH-229	Not Detected	--------	2.88E-01

[Summary Report] - Sample ID: 60059403

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.93E-02
AG-110m	Not Detected	--------	5.29E-02
AR-41	Not Detected	--------	3.96E+14
BA-133	Not Detected	--------	5.79E-02
BA-140	Not Detected	--------	1.24E-01
CD-109	Not Detected	--------	9.94E-01
CD-115	Not Detected	--------	2.28E-01
CE-139	Not Detected	--------	3.01E-02
CE-141	Not Detected	--------	5.87E-02
CE-144	Not Detected	--------	2.44E-01
CO-56	Not Detected	--------	3.47E-02
CO-57	Not Detected	--------	3.26E-02
CO-58	Not Detected	--------	2.95E-02
CO-60	Not Detected	--------	3.58E-02
CR-51	Not Detected	--------	2.49E-01
CS-134	Not Detected	--------	4.77E-02
CS-137	3.24E-01	5.74E-02	5.17E-02
CU-64	Not Detected	--------	1.43E+03
EU-152	Not Detected	--------	8.59E-02
EU-154	Not Detected	--------	1.79E-01
EU-155	Not Detected	--------	1.39E-01
FE-59	Not Detected	--------	7.40E-02
GD-153	Not Detected	--------	1.17E-01
HG-203	Not Detected	--------	2.98E-02
I-131	Not Detected	--------	4.00E-02
IN-115m	Not Detected	--------	2.23E+05
IR-192	Not Detected	--------	2.78E-02
K-40	1.76E+01	2.40	3.89E-01
LA-140	Not Detected	--------	1.64E-01
MN-54	Not Detected	--------	3.30E-02
MN-56	Not Detected	--------	7.82E+09
MO-99	Not Detected	--------	6.88E-01
NA-22	Not Detected	--------	3.86E-02
NA-24	Not Detected	--------	2.89
NB-95	Not Detected	--------	3.72E-01
ND-147	Not Detected	--------	2.41E-01
NI-57	Not Detected	--------	3.03E-01
BE-07	Not Detected	--------	2.47E-01
RU-103	Not Detected	--------	2.99E-02
RU-106	Not Detected	--------	2.76E-01
SB-122	Not Detected	--------	1.09E-01
SB-124	Not Detected	--------	3.14E-02
SB-125	Not Detected	--------	8.42E-02
SC-46	Not Detected	--------	5.10E-02
SR-85	Not Detected	--------	3.78E-02
TA-182	Not Detected	--------	1.49E-01
TA-183	Not Detected	--------	7.99E-01
TE-132	Not Detected	--------	6.34E-02
TL-201	Not Detected	--------	4.10E-01
V-48	Not Detected	--------	3.99E-02
XE-133	Not Detected	--------	4.72E-01
Y-88	Not Detected	--------	2.89E-02
ZN-65	Not Detected	--------	9.72E-02
ZR-95	Not Detected	--------	5.88E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-10-96 2:39:00 PM *
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* Analyzed by: 5/13/96 Reviewed by: 5/13/96 *
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Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029248-02
Lab Sample ID : 60059404

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 819.000 gram
Sample Date/Time : 5-06-96 10:32:00 AM
Acquire Start Date : 5-10-96 12:50:07 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.21
TH-234	2.06	5.41E-01	5.19E-01
RA-226	1.89	7.48E-01	1.08
PB-214	6.28E-01	1.01E-01	5.75E-02
BI-214	6.47E-01	1.10E-01	7.64E-02
TH-232	8.11E-01	3.83E-01	1.94E-01
RA-228	9.28E-01	1.99E-01	1.26E-01
AC-228	9.02E-01	1.64E-01	9.55E-02
TH-228	8.51E-01	2.43E-01	4.20E-01
RA-224	8.68E-01	2.17E-01	8.15E-02
PB-212	8.38E-01	1.39E-01	3.61E-02
BI-212	8.48E-01	2.82E-01	3.66E-01
TL-208	8.34E-01	1.36E-01	8.80E-02
U-235	~~2.63E-01~~	~~1.79E-01~~	2.28E-01 Not detected 5/13/96
TH-231	Not Detected	--------	2.56
PA-231	Not Detected	--------	1.35
TH-227	Not Detected	--------	3.42E-01
RA-223	Not Detected	--------	2.17E-01
RN-219	Not Detected	--------	3.58E-01
PB-211	Not Detected	--------	8.43E-01
TL-207	Not Detected	--------	1.26E+01
AM-241	Not Detected	--------	5.19E-01
PU-239	Not Detected	--------	4.73E+02
NP-237	Not Detected	--------	2.59E-01
PA-233	Not Detected	--------	5.58E-02
TH-229	Not Detected	--------	2.67E-01

[Summary Report] - Sample ID: 60059404

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.66E-02
AG-110m	Not Detected	--------	3.93E-02
AR-41	Not Detected	--------	7.36E+14
BA-133	Not Detected	--------	5.60E-02
BA-140	Not Detected	--------	1.17E-01
CD-109	Not Detected	--------	8.95E-01
CD-115	Not Detected	--------	2.19E-01
CE-139	Not Detected	--------	2.83E-02
CE-141	Not Detected	--------	5.51E-02
CE-144	Not Detected	--------	2.26E-01
CO-56	Not Detected	--------	3.19E-02
CO-57	Not Detected	--------	3.04E-02
CO-58	Not Detected	--------	2.80E-02
CO-60	Not Detected	--------	3.32E-02
CR-51	Not Detected	--------	2.33E-01
CS-134	Not Detected	--------	4.57E-02
CS-137	1.25E-01	2.76E-02	2.92E-02
CU-64	Not Detected	--------	1.49E+03
EU-152	Not Detected	--------	7.87E-02
EU-154	Not Detected	--------	1.66E-01
EU-155	Not Detected	--------	1.30E-01
FE-59	Not Detected	--------	6.80E-02
GD-153	Not Detected	--------	1.06E-01
HG-203	Not Detected	--------	2.87E-02
I-131	Not Detected	--------	3.57E-02
IN-115m	Not Detected	--------	2.74E+05
IR-192	Not Detected	--------	2.72E-02
K-40	1.77E+01	2.41	3.01E-01
LA-140	Not Detected	--------	1.66E-01
MN-54	Not Detected	--------	3.13E-02
MN-56	Not Detected	--------	1.15E+10
MO-99	Not Detected	--------	6.41E-01
NA-22	Not Detected	--------	3.75E-02
NA-24	Not Detected	--------	2.84
NB-95	Not Detected	--------	3.50E-01
ND-147	Not Detected	--------	2.26E-01
NI-57	Not Detected	--------	2.96E-01
BE-07	Not Detected	--------	2.37E-01
RU-103	Not Detected	--------	2.61E-02
RU-106	Not Detected	--------	2.50E-01
SB-122	Not Detected	--------	1.07E-01
SB-124	Not Detected	--------	2.95E-02
SB-125	Not Detected	--------	7.70E-02
SC-46	Not Detected	--------	4.82E-02
SR-85	Not Detected	--------	3.51E-02
TA-182	Not Detected	--------	1.40E-01
TA-183	Not Detected	--------	7.79E-01
TE-132	Not Detected	--------	6.13E-02
TL-201	Not Detected	--------	3.82E-01
V-48	Not Detected	--------	3.60E-02
XE-133	Not Detected	--------	4.34E-01
Y-88	Not Detected	--------	2.44E-02
ZN-65	Not Detected	--------	9.24E-02
ZR-95	Not Detected	--------	5.40E-02

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Sandia National Laboratories
*
Radiation Protection Sample Diagnostics Program [881 Laboratory]
*
5-10-96 6:26:58 PM
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*
*
* Analyzed by: 5/13/96 Reviewed by: 5/13/96
*
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029250-02
Lab Sample ID : 60059405

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 791.000 gram
Sample Date/Time : 5-06-96 10:41:00 AM
Acquire Start Date : 5-10-96 4:43:09 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	3.16	2.30	3.46
TH-234	4.72	1.02	5.68E-01
RA-226	Not Detected	--------	6.25E-01
PB-214	6.30E-01	1.05E-01	6.90E-02
BI-214	5.76E-01	9.57E-02	5.61E-02
TH-232	8.31E-01	3.93E-01	2.00E-01
RA-228	1.02	2.10E-01	1.24E-01
AC-228	9.10E-01	1.68E-01	1.06E-01
TH-228	8.60E-01	2.46E-01	4.30E-01
RA-224	8.64E-01	2.16E-01	7.55E-02
PB-212	9.05E-01	1.54E-01	3.89E-02
BI-212	7.51E-01	2.62E-01	3.43E-01
TL-208	8.21E-01	1.30E-01	7.13E-02
U-235	2.99E-01	2.12E-01	3.32E-01
TH-231	Not Detected	--------	2.88
PA-231	Not Detected	--------	1.38
TH-227	Not Detected	--------	3.61E-01
RA-223	Not Detected	--------	2.46E-01
RN-219	Not Detected	--------	3.66E-01
PB-211	Not Detected	--------	8.43E-01
TL-207	Not Detected	--------	1.21E+01
AM-241	Not Detected	--------	5.49E-01
PU-239	Not Detected	--------	4.81E+02
NP-237	Not Detected	--------	2.84E-01
PA-233	Not Detected	--------	5.54E-02
TH-229	Not Detected	--------	2.91E-01

[Summary Report] - Sample ID: 60059405

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.82E-02
AG-110m	Not Detected	--------	3.92E-02
AR-41	Not Detected	--------	3.23E+15
BA-133	Not Detected	--------	5.60E-02
BA-140	Not Detected	--------	1.18E-01
CD-109	Not Detected	--------	9.81E-01
CD-115	Not Detected	--------	2.33E-01
CE-139	Not Detected	--------	2.99E-02
CE-141	Not Detected	--------	5.85E-02
CE-144	Not Detected	--------	2.39E-01
CO-56	Not Detected	--------	3.20E-02
CO-57	Not Detected	--------	3.17E-02
CO-58	Not Detected	--------	2.97E-02
CO-60	Not Detected	--------	3.45E-02
CR-51	Not Detected	--------	2.38E-01
CS-134	Not Detected	--------	4.57E-02
CS-137	1.38E-01	3.31E-02	3.86E-02
CU-64	Not Detected	--------	1.88E+03
EU-152	Not Detected	--------	8.29E-02
EU-154	Not Detected	--------	1.73E-01
EU-155	Not Detected	--------	1.38E-01
FE-59	Not Detected	--------	7.20E-02
GD-153	Not Detected	--------	1.19E-01
HG-203	Not Detected	--------	3.29E-02
I-131	Not Detected	--------	3.69E-02
IN-115m	Not Detected	--------	4.96E+05
IR-192	Not Detected	--------	2.72E-02
K-40	1.68E+01	2.28	2.74E-01
LA-140	Not Detected	--------	1.82E-01
MN-54	Not Detected	--------	3.36E-02
MN-56	Not Detected	--------	3.13E+10
MO-99	Not Detected	--------	6.83E-01
NA-22	Not Detected	--------	3.62E-02
NA-24	Not Detected	--------	3.42
NB-95	Not Detected	--------	3.80E-01
ND-147	Not Detected	--------	2.31E-01
NI-57	Not Detected	--------	3.08E-01
BE-07	Not Detected	--------	2.33E-01
RU-103	Not Detected	--------	2.72E-02
RU-106	Not Detected	--------	2.66E-01
SB-122	Not Detected	--------	1.13E-01
SB-124	Not Detected	--------	3.05E-02
SB-125	Not Detected	--------	7.79E-02
SC-46	Not Detected	--------	4.70E-02
SR-85	Not Detected	--------	3.58E-02
TA-182	Not Detected	--------	1.37E-01
TA-183	Not Detected	--------	8.51E-01
TE-132	Not Detected	--------	6.43E-02
TL-201	Not Detected	--------	4.33E-01
V-48	Not Detected	--------	3.87E-02
XE-133	Not Detected	--------	5.02E-01
Y-88	Not Detected	--------	2.46E-02
ZN-65	Not Detected	--------	9.21E-02
ZR-95	Not Detected	--------	5.58E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-10-96 8:16:17 PM *
****
*
* Analyzed by: 5/13/96 Reviewed by: 5/13/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029251-02
Lab Sample ID : 60059406

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 694.000 gram
Sample Date/Time : 5-06-96 10:51:00 AM
Acquire Start Date : 5-10-96 6:32:29 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	1.37E+01	4.22	3.82
TH-234	1.51E+01	3.03	7.15E-01
RA-226	Not Detected	--------	7.85E-01
PB-214	6.41E-01	1.09E-01	7.77E-02
BI-214	6.11E-01	1.02E-01	5.84E-02
TH-232	8.25E-01	3.84E-01	1.63E-01
RA-228	8.92E-01	2.17E-01	1.47E-01
AC-228	8.92E-01	1.71E-01	1.18E-01
TH-228	8.66E-01	2.67E-01	5.03E-01
RA-224	9.08E-01	2.29E-01	8.51E-02
PB-212	8.89E-01	1.49E-01	4.41E-02
BI-212	1.04	3.35E-01	4.30E-01
TL-208	8.30E-01	1.44E-01	1.11E-01
U-235	7.38E-01	1.85E-01	2.20E-01
TH-231	Not Detected	--------	3.73
PA-231	Not Detected	--------	1.56
TH-227	Not Detected	--------	3.94E-01
RA-223	Not Detected	--------	3.20E-01
RN-219	Not Detected	--------	4.28E-01
PB-211	Not Detected	--------	1.00
TL-207	Not Detected	--------	1.44E+01
AM-241	Not Detected	--------	6.88E-01
PU-239	Not Detected	--------	5.82E+02
NP-237	Not Detected	--------	3.71E-01
PA-233	Not Detected	--------	6.46E-02
TH-229	Not Detected	--------	3.55E-01

[Summary Report] - Sample ID: 60059406

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.39E-02
AG-110m	Not Detected	--------	6.03E-02
AR-41	Not Detected	--------	6.42E+15
BA-133	Not Detected	--------	6.31E-02
BA-140	Not Detected	--------	1.40E-01
CD-109	Not Detected	--------	1.28
CD-115	Not Detected	--------	2.65E-01
CE-139	Not Detected	--------	3.70E-02
CE-141	Not Detected	--------	7.38E-02
CE-144	Not Detected	--------	2.87E-01
CO-56	Not Detected	--------	3.67E-02
CO-57	Not Detected	--------	3.85E-02
CO-58	Not Detected	--------	3.52E-02
CO-60	Not Detected	--------	3.86E-02
CR-51	Not Detected	--------	2.76E-01
CS-134	Not Detected	--------	5.07E-02
CS-137	3.96E-01	6.18E-02	3.82E-02
CU-64	Not Detected	--------	2.28E+03
EU-152	Not Detected	--------	9.13E-02
EU-154	Not Detected	--------	1.98E-01
EU-155	Not Detected	--------	1.69E-01
FE-59	Not Detected	--------	7.65E-02
GD-153	Not Detected	--------	1.46E-01
HG-203	Not Detected	--------	3.32E-02
I-131	Not Detected	--------	4.56E-02
IN-115m	Not Detected	--------	7.10E+05
IR-192	Not Detected	--------	3.14E-02
K-40	1.81E+01	2.48	3.51E-01
LA-140	Not Detected	--------	2.24E-01
MN-54	Not Detected	--------	3.71E-02
MN-56	Not Detected	--------	5.62E+10
MO-99	Not Detected	--------	8.42E-01
NA-22	Not Detected	--------	4.13E-02
NA-24	Not Detected	--------	4.44
NB-95	Not Detected	--------	4.21E-01
ND-147	Not Detected	--------	2.71E-01
NI-57	Not Detected	--------	3.68E-01
BE-07	Not Detected	--------	2.85E-01
RU-103	Not Detected	--------	3.21E-02
RU-106	Not Detected	--------	2.99E-01
SB-122	Not Detected	--------	1.31E-01
SB-124	Not Detected	--------	3.41E-02
SB-125	Not Detected	--------	9.32E-02
SC-46	Not Detected	--------	5.43E-02
SR-85	Not Detected	--------	4.08E-02
TA-182	Not Detected	--------	1.59E-01
TA-183	Not Detected	--------	1.07
TE-132	Not Detected	--------	7.53E-02
TL-201	Not Detected	--------	5.37E-01
V-48	Not Detected	--------	4.33E-02
XE-133	Not Detected	--------	6.48E-01
Y-88	Not Detected	--------	2.82E-02
ZN-65	Not Detected	--------	1.04E-01
ZR-95	Not Detected	--------	6.32E-02

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**********************************************************************
*                    Sandia National Laboratories                    *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]*
*                        5-10-96 10:05:14 PM                         *
**********************************************************************
*                                                                    *
* Analyzed by:  5/13/96      Reviewed by:  5/13/96                   *
**********************************************************************

Customer           : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029252-02
Lab Sample ID      : 60059407

Sample Description : MARINELLI SOLID SAMPLE
Sample Type        : Solid
Sample Geometry    : 2SMAR
Sample Quantity    :   751.000  gram
Sample Date/Time   :  5-06-96  10:54:00 AM
Acquire Start Date :  5-10-96   8:21:33 PM
Detector Name      : LAB02
Elapsed Live Time  :   6000 seconds
Elapsed Real Time  :   6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	8.09	3.62	4.76
TH-234	6.21	1.30	6.03E-01
RA-226	Not Detected	--------	1.23
PB-214	6.48E-01	1.06E-01	6.13E-02
BI-214	5.87E-01	9.97E-02	6.47E-02
TH-232	8.92E-01	4.20E-01	2.06E-01
RA-228	8.24E-01	2.11E-01	1.33E-01
AC-228	9.21E-01	1.69E-01	9.85E-02
TH-228	9.15E-01	2.98E-01	4.52E-01
RA-224	9.23E-01	2.31E-01	8.60E-02
PB-212	8.86E-01	1.55E-01	3.84E-02
BI-212	9.19E-01	3.45E-01	4.75E-01
TL-208	7.48E-01	1.23E-01	7.61E-02
U-235	2.42E-01	1.75E-01	2.73E-01
TH-231	Not Detected	--------	3.00
PA-231	Not Detected	--------	1.41
TH-227	Not Detected	--------	3.64E-01
RA-223	Not Detected	--------	2.57E-01
RN-219	Not Detected	--------	3.81E-01
PB-211	Not Detected	--------	9.01E-01
TL-207	Not Detected	--------	1.22E+01
AM-241	Not Detected	--------	5.81E-01
PU-239	Not Detected	--------	4.66E+02
NP-237	Not Detected	--------	3.07E-01
PA-233	Not Detected	--------	5.67E-02
TH-229	Not Detected	--------	3.08E-01

[Summary Report] - Sample ID: 60059407

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.00E-02
AG-110m	Not Detected	--------	3.47E-02
AR-41	Not Detected	--------	1.21E+16
BA-133	Not Detected	--------	5.89E-02
BA-140	Not Detected	--------	1.29E-01
CD-109	Not Detected	--------	1.06
CD-115	Not Detected	--------	2.55E-01
CE-139	Not Detected	--------	3.11E-02
CE-141	Not Detected	--------	6.30E-02
CE-144	Not Detected	--------	2.46E-01
CO-56	Not Detected	--------	3.43E-02
CO-57	Not Detected	--------	3.32E-02
CO-58	Not Detected	--------	3.09E-02
CO-60	Not Detected	--------	3.51E-02
CR-51	Not Detected	--------	2.54E-01
CS-134	Not Detected	--------	4.73E-02
CS-137	4.72E-02	2.11E-02	3.03E-02
CU-64	Not Detected	--------	2.23E+03
EU-152	Not Detected	--------	8.59E-02
EU-154	Not Detected	--------	1.81E-01
EU-155	Not Detected	--------	1.47E-01
FE-59	Not Detected	--------	7.19E-02
GD-153	Not Detected	--------	1.24E-01
HG-203	Not Detected	--------	2.97E-02
I-131	Not Detected	--------	3.85E-02
IN-115m	Not Detected	--------	8.81E+05
IR-192	Not Detected	--------	2.79E-02
K-40	1.75E+01	2.38	2.84E-01
LA-140	Not Detected	--------	2.02E-01
MN-54	Not Detected	--------	1.97E-02
MN-56	Not Detected	--------	8.42E+10
MO-99	Not Detected	--------	7.45E-01
NA-22	Not Detected	--------	4.06E-02
NA-24	Not Detected	--------	4.17
NB-95	Not Detected	--------	3.94E-01
ND-147	Not Detected	--------	2.29E-01
NI-57	Not Detected	--------	3.45E-01
BE-07	Not Detected	--------	2.37E-01
RU-103	Not Detected	--------	2.82E-02
RU-106	Not Detected	--------	2.59E-01
SB-122	Not Detected	--------	1.23E-01
SB-124	Not Detected	--------	3.20E-02
SB-125	Not Detected	--------	8.47E-02
SC-46	Not Detected	--------	5.00E-02
SR-85	Not Detected	--------	3.84E-02
TA-182	Not Detected	--------	1.45E-01
TA-183	Not Detected	--------	9.12E-01
TE-132	Not Detected	--------	6.81E-02
TL-201	Not Detected	--------	4.73E-01
V-48	Not Detected	--------	3.86E-02
XE-133	Not Detected	--------	5.45E-01
Y-88	Not Detected	--------	2.59E-02
ZN-65	Not Detected	--------	9.51E-02
ZR-95	Not Detected	--------	5.92E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-10-96 11:54:10 PM *
****
*
* Analyzed by: 5/13/96 Reviewed by: 5/13/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029253-02
Lab Sample ID : 60059408

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 791.000 gram
Sample Date/Time : 5-06-96 11:00:00 AM
Acquire Start Date : 5-10-96 10:10:33 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.25
TH-234	2.37	5.82E-01	5.13E-01
RA-226	2.59	5.75E-01	6.26E-01
PB-214	6.24E-01	1.06E-01	7.61E-02
BI-214	5.86E-01	9.55E-02	4.91E-02
TH-232	8.11E-01	3.81E-01	1.82E-01
RA-228	8.97E-01	2.54E-01	1.34E-01
AC-228	8.08E-01	1.52E-01	9.73E-02
TH-228	9.06E-01	2.50E-01	3.99E-01
RA-224	8.87E-01	2.21E-01	7.60E-02
PB-212	8.04E-01	1.45E-01	3.78E-02
BI-212	9.53E-01	3.03E-01	3.87E-01
TL-208	7.46E-01	1.24E-01	8.47E-02
U-235	~~1.10E-01~~	~~1.75E-01~~	2.25E-01 Not detected 5/13/96
TH-231	Not Detected	--------	2.66
PA-231	Not Detected	--------	1.33
TH-227	Not Detected	--------	3.43E-01
RA-223	Not Detected	--------	2.30E-01
RN-219	Not Detected	--------	3.53E-01
PB-211	Not Detected	--------	8.09E-01
TL-207	Not Detected	--------	1.24E+01
AM-241	Not Detected	--------	5.09E-01
PU-239	Not Detected	--------	5.51E+02
NP-237	Not Detected	--------	2.71E-01
PA-233	Not Detected	--------	5.57E-02
TH-229	Not Detected	--------	2.66E-01

[Summary Report] - Sample ID: 60059408

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.86E-02
AG-110m	Not Detected	--------	2.91E-02
AR-41	Not Detected	--------	2.24E+16
BA-133	Not Detected	--------	5.54E-02
BA-140	Not Detected	--------	1.17E-01
CD-109	Not Detected	--------	9.37E-01
CD-115	Not Detected	--------	2.44E-01
CE-139	Not Detected	--------	2.81E-02
CE-141	Not Detected	--------	5.55E-02
CE-144	Not Detected	--------	2.30E-01
CO-56	Not Detected	--------	3.21E-02
CO-57	Not Detected	--------	2.97E-02
CO-58	Not Detected	--------	2.98E-02
CO-60	Not Detected	--------	3.36E-02
CR-51	Not Detected	--------	2.33E-01
CS-134	Not Detected	--------	4.69E-02
CS-137	Not Detected	--------	3.19E-02
CU-64	Not Detected	--------	2.42E+03
EU-152	Not Detected	--------	7.85E-02
EU-154	Not Detected	--------	1.74E-01
EU-155	Not Detected	--------	1.32E-01
FE-59	Not Detected	--------	6.83E-02
GD-153	Not Detected	--------	1.08E-01
HG-203	Not Detected	--------	2.78E-02
I-131	Not Detected	--------	3.66E-02
IN-115m	Not Detected	--------	1.07E+06
IR-192	Not Detected	--------	2.65E-02
K-40	1.73E+01	2.35	2.93E-01
LA-140	Not Detected	--------	2.06E-01
MN-54	Not Detected	--------	3.24E-02
MN-56	Not Detected	--------	1.25E+11
MO-99	Not Detected	--------	6.87E-01
NA-22	Not Detected	--------	3.82E-02
NA-24	Not Detected	--------	4.67
NB-95	Not Detected	--------	3.76E-01
ND-147	Not Detected	--------	2.17E-01
NI-57	Not Detected	--------	3.47E-01
BE-07	Not Detected	--------	2.29E-01
RU-103	Not Detected	--------	2.66E-02
RU-106	Not Detected	--------	2.54E-01
SB-122	Not Detected	--------	1.09E-01
SB-124	Not Detected	--------	3.15E-02
SB-125	Not Detected	--------	7.67E-02
SC-46	Not Detected	--------	4.76E-02
SR-85	Not Detected	--------	3.38E-02
TA-182	Not Detected	--------	1.39E-01
TA-183	Not Detected	--------	8.04E-01
TE-132	Not Detected	--------	6.70E-02
TL-201	Not Detected	--------	4.14E-01
V-48	Not Detected	--------	3.69E-02
XE-133	Not Detected	--------	4.91E-01
Y-88	Not Detected	--------	2.41E-02
ZN-65	Not Detected	--------	9.39E-02
ZR-95	Not Detected	--------	5.42E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
5-11-96 1:43:25 AM

Analyzed by: 5/13/96 Reviewed by: 5/13/96

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029255-02
Lab Sample ID : 60059409

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 669.000 gram
Sample Date/Time : 5-06-96 11:08:00 AM
Acquire Start Date : 5-10-96 11:59:41 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.96
TH-234	4.90	1.11	6.33E-01
RA-226	Not Detected	--------	8.00E-01
PB-214	6.84E-01	1.19E-01	9.09E-02
BI-214	5.97E-01	1.03E-01	7.03E-02
TH-232	1.05	5.00E-01	2.76E-01
RA-228	8.91E-01	2.64E-01	1.68E-01
AC-228	1.02	2.46E-01	8.26E-02
TH-228	9.48E-01	2.85E-01	5.26E-01
RA-224	1.08	2.69E-01	1.02E-01
PB-212	1.03	1.57E-01	4.26E-02
BI-212	8.13E-01	3.62E-01	5.20E-01
TL-208	8.62E-01	1.44E-01	9.72E-02
U-235	2.31E-01	1.65E-01	2.57E-01
TH-231	Not Detected	--------	3.11
PA-231	Not Detected	--------	1.51
TH-227	Not Detected	--------	4.11E-01
RA-223	Not Detected	--------	2.68E-01
RN-219	Not Detected	--------	4.16E-01
PB-211	Not Detected	--------	9.61E-01
TL-207	Not Detected	--------	1.53E+01
AM-241	Not Detected	--------	6.06E-01
PU-239	Not Detected	--------	4.95E+02
NP-237	Not Detected	--------	3.20E-01
PA-233	Not Detected	--------	6.29E-02
TH-229	Not Detected	--------	3.21E-01

[Summary Report] - Sample ID: 60059409

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.46E-02
AG-110m	Not Detected	--------	3.86E-02
AR-41	Not Detected	--------	4.62E+16
BA-133	Not Detected	--------	6.39E-02
BA-140	Not Detected	--------	1.42E-01
CD-109	Not Detected	--------	1.11
CD-115	Not Detected	--------	2.86E-01
CE-139	Not Detected	--------	3.41E-02
CE-141	Not Detected	--------	6.61E-02
CE-144	Not Detected	--------	2.71E-01
CO-56	Not Detected	--------	3.75E-02
CO-57	Not Detected	--------	3.57E-02
CO-58	Not Detected	--------	3.44E-02
CO-60	Not Detected	--------	3.71E-02
CR-51	Not Detected	--------	2.73E-01
CS-134	Not Detected	--------	5.22E-02
CS-137	2.66E-02	3.18E-02	5.11E-02
CU-64	Not Detected	--------	3.20E+03
EU-152	Not Detected	--------	9.34E-02
EU-154	Not Detected	--------	2.01E-01
EU-155	Not Detected	--------	1.59E-01
FE-59	Not Detected	--------	8.47E-02
GD-153	Not Detected	--------	1.30E-01
HG-203	Not Detected	--------	3.28E-02
I-131	Not Detected	--------	4.23E-02
IN-115m	Not Detected	--------	1.60E+06
IR-192	Not Detected	--------	3.08E-02
K-40	1.90E+01	2.59	3.34E-01
LA-140	Not Detected	--------	2.42E-01
MN-54	Not Detected	--------	2.48E-02
MN-56	Not Detected	--------	2.30E+11
MO-99	Not Detected	--------	8.41E-01
NA-22	Not Detected	--------	4.46E-02
NA-24	Not Detected	--------	5.65
NB-95	Not Detected	--------	4.58E-01
ND-147	Not Detected	--------	2.76E-01
NI-57	Not Detected	--------	4.09E-01
BE-07	Not Detected	--------	2.84E-01
RU-103	Not Detected	--------	3.13E-02
RU-106	Not Detected	--------	3.16E-01
SB-122	Not Detected	--------	1.33E-01
SB-124	Not Detected	--------	3.66E-02
SB-125	Not Detected	--------	9.13E-02
SC-46	Not Detected	--------	5.65E-02
SR-85	Not Detected	--------	4.30E-02
TA-182	Not Detected	--------	1.66E-01
TA-183	Not Detected	--------	9.73E-01
TE-132	Not Detected	--------	7.85E-02
TL-201	Not Detected	--------	4.96E-01
V-48	Not Detected	--------	4.58E-02
XE-133	Not Detected	--------	5.95E-01
Y-88	Not Detected	--------	2.86E-02
ZN-65	Not Detected	--------	1.10E-01
ZR-95	Not Detected	--------	6.30E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
5-11-96 3:32:54 AM

Analyzed by: 5/13/96 Reviewed by: 5/13/96

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029256-02
Lab Sample ID : 60059410

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 845.000 gram
Sample Date/Time : 5-06-96 11:10:00 AM
Acquire Start Date : 5-11-96 1:48:55 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	5.23	2.41	3.18
TH-234	6.66	1.40	5.70E-01
RA-226	2.51	1.04	7.32E-01
PB-214	6.45E-01	1.02E-01	4.88E-02
BI-214	5.96E-01	9.76E-02	5.50E-02
TH-232	8.04E-01	3.76E-01	1.75E-01
RA-228	9.46E-01	2.84E-01	1.23E-01
AC-228	8.17E-01	1.62E-01	1.31E-01
TH-228	7.84E-01	2.39E-01	4.07E-01
RA-224	8.73E-01	2.16E-01	6.99E-02
PB-212	8.23E-01	1.48E-01	3.56E-02
BI-212	8.30E-01	2.49E-01	3.03E-01
TL-208	7.60E-01	1.25E-01	8.15E-02
U-235	2.71E-01	1.27E-01	1.88E-01
TH-231	Not Detected	--------	2.87
PA-231	Not Detected	--------	1.35
TH-227	Not Detected	--------	3.36E-01
RA-223	Not Detected	--------	2.50E-01
RN-219	Not Detected	--------	3.63E-01
PB-211	Not Detected	--------	8.66E-01
TL-207	Not Detected	--------	1.23E+01
AM-241	Not Detected	--------	5.34E-01
PU-239	Not Detected	--------	4.33E+02
NP-237	Not Detected	--------	2.96E-01
PA-233	Not Detected	--------	5.31E-02
TH-229	Not Detected	--------	2.83E-01

[Summary Report] - Sample ID: 60059410

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.63E-02
AG-110m	Not Detected	--------	4.05E-02
AR-41	Not Detected	--------	8.13E+16
BA-133	Not Detected	--------	5.44E-02
BA-140	Not Detected	--------	1.21E-01
CD-109	Not Detected	--------	1.02
CD-115	Not Detected	--------	2.52E-01
CE-139	Not Detected	--------	2.97E-02
CE-141	Not Detected	--------	5.90E-02
CE-144	Not Detected	--------	2.35E-01
CO-56	Not Detected	--------	3.22E-02
CO-57	Not Detected	--------	3.18E-02
CO-58	Not Detected	--------	2.83E-02
CO-60	Not Detected	--------	3.11E-02
CR-51	Not Detected	--------	2.34E-01
CS-134	Not Detected	--------	4.53E-02
CS-137	1.68E-01	3.05E-02	2.51E-02
CU-64	Not Detected	--------	2.81E+03
EU-152	Not Detected	--------	8.00E-02
EU-154	Not Detected	--------	1.65E-01
EU-155	Not Detected	--------	1.37E-01
FE-59	Not Detected	--------	6.73E-02
GD-153	Not Detected	--------	1.18E-01
HG-203	Not Detected	--------	2.82E-02
I-131	Not Detected	--------	3.73E-02
IN-115m	Not Detected	--------	1.82E+06
IR-192	Not Detected	--------	2.61E-02
K-40	1.77E+01	2.40	3.09E-01
LA-140	Not Detected	--------	2.03E-01
MN-54	Not Detected	--------	3.09E-02
MN-56	Not Detected	--------	3.19E+11
MO-99	Not Detected	--------	7.38E-01
NA-22	Not Detected	--------	3.91E-02
NA-24	Not Detected	--------	5.21
NB-95	Not Detected	--------	3.81E-01
ND-147	Not Detected	--------	2.30E-01
NI-57	Not Detected	--------	3.74E-01
BE-07	Not Detected	--------	2.29E-01
RU-103	Not Detected	--------	2.76E-02
RU-106	Not Detected	--------	2.51E-01
SB-122	Not Detected	--------	1.21E-01
SB-124	Not Detected	--------	2.96E-02
SB-125	Not Detected	--------	7.76E-02
SC-46	Not Detected	--------	4.98E-02
SR-85	Not Detected	--------	3.47E-02
TA-182	Not Detected	--------	1.45E-01
TA-183	Not Detected	--------	8.62E-01
TE-132	Not Detected	--------	7.00E-02
TL-201	Not Detected	--------	4.63E-01
V-48	Not Detected	--------	3.67E-02
XE-133	Not Detected	--------	5.61E-01
Y-88	Not Detected	--------	2.65E-02
ZN-65	Not Detected	--------	9.23E-02
ZR-95	Not Detected	--------	5.52E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-11-96 5:22:05 AM *
****

* Analyzed by: 5/14/96 Reviewed by: 5/14/96 *

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029257-02
Lab Sample ID : 60059411

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 814.000 gram
Sample Date/Time : 5-06-96 11:17:00 AM
Acquire Start Date : 5-11-96 3:38:12 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.25
TH-234	2.00	5.18E-01	5.31E-01
RA-226	2.31	6.02E-01	7.46E-01
PB-214	6.72E-01	1.08E-01	5.84E-02
BI-214	6.30E-01	1.16E-01	3.94E-02
TH-232	8.56E-01	4.02E-01	1.93E-01
RA-228	9.14E-01	1.96E-01	1.23E-01
AC-228	9.25E-01	1.73E-01	1.19E-01
TH-228	8.98E-01	2.56E-01	4.48E-01
RA-224	9.47E-01	2.34E-01	8.11E-02
PB-212	8.88E-01	1.53E-01	3.77E-02
BI-212	1.03	3.05E-01	3.77E-01
TL-208	8.20E-01	1.32E-01	7.92E-02
U-235	~~1.51E-01~~	~~1.78E-01~~	2.29E-01 Not detected 5/14/96
TH-231	Not Detected	--------	2.64
PA-231	Not Detected	--------	1.36
TH-227	Not Detected	--------	3.55E-01
RA-223	Not Detected	--------	2.32E-01
RN-219	Not Detected	--------	3.62E-01
PB-211	Not Detected	--------	8.44E-01
TL-207	Not Detected	--------	1.29E+01
AM-241	Not Detected	--------	5.36E-01
PU-239	Not Detected	--------	4.11E+02
NP-237	Not Detected	--------	2.57E-01
PA-233	Not Detected	--------	5.52E-02
TH-229	Not Detected	--------	2.73E-01

[Summary Report] - Sample ID: 60059411

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.78E-02
AG-110m	Not Detected	--------	4.35E-02
AR-41	Not Detected	--------	1.54E+17
BA-133	Not Detected	--------	5.62E-02
BA-140	Not Detected	--------	1.23E-01
CD-109	Not Detected	--------	8.89E-01
CD-115	Not Detected	--------	2.64E-01
CE-139	Not Detected	--------	2.89E-02
CE-141	Not Detected	--------	5.70E-02
CE-144	Not Detected	--------	2.28E-01
CO-56	Not Detected	--------	3.12E-02
CO-57	Not Detected	--------	3.10E-02
CO-58	Not Detected	--------	3.11E-02
CO-60	Not Detected	--------	3.34E-02
CR-51	Not Detected	--------	2.36E-01
CS-134	Not Detected	--------	1.62E-02
CS-137	2.00E-01	3.99E-02	4.06E-02
CU-64	Not Detected	--------	3.24E+03
EU-152	Not Detected	--------	8.03E-02
EU-154	Not Detected	--------	1.72E-01
EU-155	Not Detected	--------	1.31E-01
FE-59	Not Detected	--------	6.80E-02
GD-153	Not Detected	--------	1.09E-01
HG-203	Not Detected	--------	2.90E-02
I-131	Not Detected	--------	3.86E-02
IN-115m	Not Detected	--------	2.42E+06
IR-192	Not Detected	--------	2.69E-02
K-40	1.73E+01	2.36	3.17E-01
LA-140	Not Detected	--------	2.25E-01
MN-54	Not Detected	--------	3.13E-02
MN-56	Not Detected	--------	4.88E+11
MO-99	Not Detected	--------	7.45E-01
NA-22	Not Detected	--------	3.83E-02
NA-24	Not Detected	--------	6.05
NB-95	Not Detected	--------	4.06E-01
ND-147	Not Detected	--------	2.32E-01
NI-57	Not Detected	--------	3.94E-01
BE-07	Not Detected	--------	2.34E-01
RU-103	Not Detected	--------	2.82E-02
RU-106	Not Detected	--------	2.59E-01
SB-122	Not Detected	--------	1.19E-01
SB-124	~~1.07E-02~~	~~6.80E-03~~	1.70E-02 Not detected 5/14/96
SB-125	Not Detected	--------	8.04E-02
SC-46	Not Detected	--------	4.84E-02
SR-85	Not Detected	--------	3.53E-02
TA-182	Not Detected	--------	1.42E-01
TA-183	Not Detected	--------	8.77E-01
TE-132	Not Detected	--------	7.04E-02
TL-201	Not Detected	--------	4.43E-01
V-48	Not Detected	--------	3.86E-02
XE-133	Not Detected	--------	5.22E-01
Y-88	Not Detected	--------	2.74E-02
ZN-65	Not Detected	--------	9.29E-02
ZR-95	Not Detected	--------	5.53E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-11-96 7:11:14 AM *
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*
* Analyzed by: 5/14/96 Reviewed by: 5/14/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029258-02
Lab Sample ID : 60059412

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 825.000 gram
Sample Date/Time : 5-06-96 11:18:00 AM
Acquire Start Date : 5-11-96 5:27:27 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.21
TH-234	1.47	4.28E-01	5.15E-01
RA-226	1.80	5.22E-01	6.78E-01
PB-214	6.91E-01	1.13E-01	6.94E-02
BI-214	6.24E-01	1.06E-01	7.26E-02
TH-232	8.27E-01	3.90E-01	1.94E-01
RA-228	8.54E-01	1.87E-01	1.28E-01
AC-228	8.86E-01	1.61E-01	9.19E-02
TH-228	7.83E-01	2.33E-01	4.14E-01
RA-224	9.17E-01	2.25E-01	6.50E-02
PB-212	8.61E-01	1.43E-01	3.54E-02
BI-212	8.74E-01	2.95E-01	3.87E-01
TL-208	7.98E-01	1.30E-01	8.41E-02
U-235	Not Detected	--------	2.17E-01
TH-231	Not Detected	--------	2.56
PA-231	Not Detected	--------	1.30
TH-227	Not Detected	--------	3.47E-01
RA-223	Not Detected	--------	2.22E-01
RN-219	Not Detected	--------	3.69E-01
PB-211	Not Detected	--------	8.52E-01
TL-207	Not Detected	--------	1.28E+01
AM-241	Not Detected	--------	4.98E-01
PU-239	Not Detected	--------	5.31E+02
NP-237	Not Detected	--------	2.66E-01
PA-233	Not Detected	--------	5.30E-02
TH-229	Not Detected	--------	2.72E-01

[Summary Report] - Sample ID: 60059412

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.69E-02
AG-110m	Not Detected	--------	4.10E-02
AR-41	Not Detected	--------	3.22E+17
BA-133	Not Detected	--------	5.60E-02
BA-140	Not Detected	--------	1.28E-01
CD-109	Not Detected	--------	9.22E-01
CD-115	Not Detected	--------	2.72E-01
CE-139	Not Detected	--------	2.88E-02
CE-141	Not Detected	--------	5.42E-02
CE-144	Not Detected	--------	2.26E-01
CO-56	Not Detected	--------	3.21E-02
CO-57	Not Detected	--------	3.05E-02
CO-58	Not Detected	--------	2.91E-02
CO-60	Not Detected	--------	3.35E-02
CR-51	Not Detected	--------	2.31E-01
CS-134	Not Detected	--------	4.55E-02
CS-137	1.58E-01	3.16E-02	3.08E-02
CU-64	Not Detected	--------	3.67E+03
EU-152	Not Detected	--------	7.80E-02
EU-154	Not Detected	--------	1.67E-01
EU-155	Not Detected	--------	1.31E-01
FE-59	Not Detected	--------	6.65E-02
GD-153	Not Detected	--------	1.08E-01
HG-203	Not Detected	--------	2.75E-02
I-131	Not Detected	--------	3.73E-02
IN-115m	Not Detected	--------	3.21E+06
IR-192	Not Detected	--------	2.59E-02
K-40	1.79E+01	2.43	2.62E-01
LA-140	Not Detected	--------	2.34E-01
MN-54	Not Detected	--------	3.00E-02
MN-56	Not Detected	--------	8.13E+11
MO-99	Not Detected	--------	7.46E-01
NA-22	Not Detected	--------	3.73E-02
NA-24	Not Detected	--------	6.44
NB-95	Not Detected	--------	4.02E-01
ND-147	Not Detected	--------	2.36E-01
NI-57	Not Detected	--------	3.97E-01
BE-07	Not Detected	--------	2.38E-01
RU-103	Not Detected	--------	2.71E-02
RU-106	Not Detected	--------	2.58E-01
SB-122	Not Detected	--------	1.19E-01
SB-124	Not Detected	--------	3.02E-02
SB-125	Not Detected	--------	7.77E-02
SC-46	Not Detected	--------	4.81E-02
SR-85	Not Detected	--------	3.44E-02
TA-182	Not Detected	--------	1.41E-01
TA-183	Not Detected	--------	8.23E-01
TE-132	Not Detected	--------	7.24E-02
TL-201	Not Detected	--------	4.32E-01
V-48	Not Detected	--------	3.76E-02
XE-133	Not Detected	--------	5.32E-01
Y-88	Not Detected	--------	2.22E-02
ZN-65	Not Detected	--------	9.18E-02
ZR-95	Not Detected	--------	5.80E-02

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*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program [881 Laboratory]
* 5-11-96 9:00:30 AM
*
* Analyzed by: 5/14/96 Reviewed by: 5/14/96
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Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029260-02
Lab Sample ID : 60059413

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 747.000 gram
Sample Date/Time : 5-06-96 11:26:00 AM
Acquire Start Date : 5-11-96 7:16:43 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.48
TH-234	2.19	5.71E-01	5.72E-01
RA-226	Not Detected	--------	9.35E-01
PB-214	7.20E-01	1.19E-01	7.77E-02
BI-214	5.74E-01	9.68E-02	6.01E-02
TH-232	8.24E-01	3.82E-01	1.52E-01
RA-228	9.09E-01	2.95E-01	1.51E-01
AC-228	1.00	1.82E-01	1.04E-01
TH-228	7.31E-01	2.36E-01	4.87E-01
RA-224	8.66E-01	2.16E-01	6.70E-02
PB-212	8.87E-01	1.48E-01	3.80E-02
BI-212	7.78E-01	2.73E-01	3.59E-01
TL-208	8.44E-01	1.39E-01	9.23E-02
~~U-235~~	~~1.09E-01~~	~~1.92E-01~~	2.47E-01 not detected 5/14/96
TH-231	Not Detected	--------	2.79
PA-231	Not Detected	--------	1.45
TH-227	Not Detected	--------	3.71E-01
RA-223	Not Detected	--------	2.42E-01
RN-219	Not Detected	--------	3.99E-01
PB-211	Not Detected	--------	9.25E-01
TL-207	Not Detected	--------	1.32E+01
AM-241	Not Detected	--------	5.39E-01
PU-239	Not Detected	--------	5.21E+02
NP-237	Not Detected	--------	2.61E-01
PA-233	Not Detected	--------	5.88E-02
TH-229	Not Detected	--------	2.92E-01

[Summary Report] - Sample ID: 60059413

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.98E-02
AG-110m	Not Detected	--------	6.31E-02
AR-41	Not Detected	--------	6.39E+17
BA-133	Not Detected	--------	6.05E-02
BA-140	Not Detected	--------	1.39E-01
CD-109	Not Detected	--------	9.05E-01
CD-115	Not Detected	--------	2.99E-01
CE-139	Not Detected	--------	3.02E-02
CE-141	Not Detected	--------	6.08E-02
CE-144	Not Detected	--------	2.51E-01
CO-56	Not Detected	--------	3.66E-02
CO-57	Not Detected	--------	3.30E-02
CO-58	Not Detected	--------	3.13E-02
CO-60	Not Detected	--------	3.60E-02
CR-51	Not Detected	--------	2.53E-01
CS-134	Not Detected	--------	4.74E-02
CS-137	5.29E-01	7.64E-02	3.17E-02
CU-64	Not Detected	--------	4.08E+03
EU-152	Not Detected	--------	8.92E-02
EU-154	Not Detected	--------	1.78E-01
EU-155	Not Detected	--------	8.76E-02
FE-59	Not Detected	--------	7.40E-02
GD-153	Not Detected	--------	1.16E-01
HG-203	Not Detected	--------	3.10E-02
I-131	Not Detected	--------	4.19E-02
IN-115m	Not Detected	--------	4.49E+06
IR-192	Not Detected	--------	2.91E-02
K-40	1.81E+01	2.46	2.93E-01
LA-140	Not Detected	--------	2.59E-01
MN-54	Not Detected	--------	3.40E-02
MN-56	Not Detected	--------	1.46E+12
MO-99	Not Detected	--------	8.46E-01
NA-22	Not Detected	--------	3.91E-02
NA-24	Not Detected	--------	7.27
NB-95	Not Detected	--------	4.37E-01
ND-147	Not Detected	--------	2.66E-01
NI-57	Not Detected	--------	4.38E-01
BE-07	Not Detected	--------	2.62E-01
RU-103	Not Detected	--------	2.88E-02
RU-106	Not Detected	--------	2.84E-01
SB-122	Not Detected	--------	1.34E-01
SB-124	Not Detected	--------	3.18E-02
SB-125	Not Detected	--------	8.60E-02
SC-46	Not Detected	--------	5.08E-02
SR-85	Not Detected	--------	3.72E-02
TA-182	Not Detected	--------	1.48E-01
TA-183	Not Detected	--------	9.02E-01
TE-132	Not Detected	--------	7.83E-02
TL-201	Not Detected	--------	4.88E-01
V-48	Not Detected	--------	4.06E-02
XE-133	Not Detected	--------	5.96E-01
Y-88	Not Detected	--------	2.67E-02
ZN-65	Not Detected	--------	9.76E-02
ZR-95	Not Detected	--------	5.96E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-11-96 10:47:43 AM *
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*
* Analyzed by: 5/14/96 Reviewed by: 5/14/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029263-02
Lab Sample ID : 60059414

Sample Description : MARINELLI LIQUID SAMPLE
Sample Type : Liquid
Sample Geometry : 2WMAR
Sample Quantity : 500.000 mL
Sample Date/Time : 5-06-96 1:15:00 PM
Acquire Start Date : 5-11-96 9:05:47 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6001 seconds

Comments:

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Nuclide	Activity (pCi/mL)	2S Error	MDA
U-238	Not Detected	--------	1.64
TH-234	Not Detected	--------	3.96E-01
RA-226	Not Detected	--------	4.58E-01
PB-214	Not Detected	--------	4.16E-02
BI-214	Not Detected	--------	4.78E-02
TH-232	Not Detected	--------	1.20E-01
RA-228	Not Detected	--------	1.33E-01
AC-228	Not Detected	--------	7.04E-02
TH-228	Not Detected	--------	4.19E-01
RA-224	Not Detected	--------	1.05E-01
PB-212	Not Detected	--------	3.04E-02
BI-212	Not Detected	--------	3.03E-01
TL-208	Not Detected	--------	5.85E-02
U-235	Not Detected	--------	1.42E-01
TH-231	Not Detected	--------	1.35
PA-231	Not Detected	--------	8.91E-01
TH-227	Not Detected	--------	1.22E-01
RA-223	Not Detected	--------	1.21E-01
RN-219	Not Detected	--------	2.54E-01
PB-211	Not Detected	--------	5.64E-01
TL-207	Not Detected	--------	7.91
AM-241	Not Detected	--------	2.72E-01
PU-239	Not Detected	--------	2.68E+02
NP-237	Not Detected	--------	1.77E-01
PA-233	Not Detected	--------	3.85E-02
TH-229	Not Detected	--------	1.73E-01

[Summary Report] - Sample ID: 60059414

Nuclide	Activity (pCi/mL)	2S Error	MDA
AG-108m	Not Detected	--------	2.31E-02
AG-110m	Not Detected	--------	1.98E-02
AR-41	Not Detected	--------	3.73E+17
BA-133	Not Detected	--------	2.55E-02
BA-140	Not Detected	--------	7.91E-02
CD-109	Not Detected	--------	5.97E-01
CD-115	Not Detected	--------	1.35E-01
CE-139	Not Detected	--------	1.91E-02
CE-141	Not Detected	--------	3.40E-02
CE-144	Not Detected	--------	1.49E-01
CO-56	Not Detected	--------	2.83E-02
CO-57	Not Detected	--------	2.01E-02
CO-58	Not Detected	--------	2.10E-02
CO-60	Not Detected	--------	2.38E-02
CR-51	Not Detected	--------	1.65E-01
CS-134	Not Detected	--------	2.27E-02
CS-137	Not Detected	--------	2.10E-02
CU-64	Not Detected	--------	2.76E+03
EU-152	Not Detected	--------	5.38E-02
EU-154	Not Detected	--------	1.06E-01
EU-155	Not Detected	--------	8.18E-02
FE-59	Not Detected	--------	4.16E-02
GD-153	Not Detected	--------	6.77E-02
HG-203	Not Detected	--------	1.91E-02
I-131	Not Detected	--------	2.62E-02
IN-115m	Not Detected	--------	2.03E+06
IR-192	Not Detected	--------	1.92E-02
K-40	Not Detected	--------	2.96E-01
LA-140	Not Detected	--------	1.91E-01
MN-54	Not Detected	--------	2.14E-02
MN-56	Not Detected	--------	1.13E+12
MO-99	Not Detected	--------	5.28E-01
NA-22	Not Detected	--------	2.27E-02
NA-24	Not Detected	--------	4.60
NB-95	Not Detected	--------	1.43E-01
ND-147	Not Detected	--------	1.56E-01
NI-57	Not Detected	--------	2.79E-01
BE-07	Not Detected	--------	1.73E-01
RU-103	Not Detected	--------	2.06E-02
RU-106	Not Detected	--------	1.98E-01
SB-122	Not Detected	--------	9.11E-02
SB-124	Not Detected	--------	2.29E-02
SB-125	Not Detected	--------	5.35E-02
SC-46	Not Detected	--------	2.75E-02
SR-85	Not Detected	--------	2.84E-02
TA-182	Not Detected	--------	8.08E-02
TA-183	Not Detected	--------	4.75E-01
TE-132	Not Detected	--------	4.69E-02
TL-201	Not Detected	--------	2.32E-01
V-48	Not Detected	--------	2.46E-02
XE-133	Not Detected	--------	2.99E-01
Y-88	Not Detected	--------	2.78E-02
ZN-65	Not Detected	--------	4.79E-02
ZR-95	Not Detected	--------	3.76E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-11-96 12:33:50 PM *
****
*
* Analyzed by: 5/14/96 Reviewed by: 5/14/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029264-02
Lab Sample ID : 60059415

Sample Description : MARINELLI LIQUID SAMPLE
Sample Type : Liquid
Sample Geometry : 2WMAR
Sample Quantity : 500.000 mL
Sample Date/Time : 5-06-96 1:15:00 PM
Acquire Start Date : 5-11-96 10:51:53 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6001 seconds

Comments:

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Nuclide	Activity (pCi/mL)	2S Error	MDA
U-238	Not Detected	--------	1.64
TH-234	Not Detected	--------	3.91E-01
RA-226	Not Detected	--------	4.41E-01
PB-214	Not Detected	--------	4.13E-02
BI-214	Not Detected	--------	4.87E-02
TH-232	Not Detected	--------	1.32E-01
RA-228	Not Detected	--------	1.32E-01
AC-228	Not Detected	--------	7.42E-02
TH-228	Not Detected	--------	4.22E-01
RA-224	Not Detected	--------	9.33E-02
PB-212	Not Detected	--------	3.18E-02
BI-212	Not Detected	--------	3.01E-01
TL-208	Not Detected	--------	6.16E-02
U-235	Not Detected	--------	1.45E-01
TH-231	Not Detected	--------	1.40
PA-231	Not Detected	--------	8.94E-01
TH-227	Not Detected	--------	1.28E-01
RA-223	Not Detected	--------	1.24E-01
RN-219	Not Detected	--------	2.45E-01
PB-211	Not Detected	--------	5.41E-01
TL-207	Not Detected	--------	8.82
AM-241	Not Detected	--------	3.13E-01
PU-239	Not Detected	--------	2.73E+02
NP-237	Not Detected	--------	1.84E-01
PA-233	Not Detected	--------	3.53E-02
TH-229	Not Detected	--------	1.68E-01

[Summary Report] - Sample ID: 60059415

Nuclide	Activity (pCi/mL)	2S Error	MDA
AG-108m	Not Detected	--------	2.19E-02
AG-110m	Not Detected	--------	1.96E-02
AR-41	Not Detected	--------	7.64E+17
BA-133	Not Detected	--------	2.53E-02
BA-140	Not Detected	--------	8.28E-02
CD-109	Not Detected	--------	6.16E-01
CD-115	Not Detected	--------	1.52E-01
CE-139	Not Detected	--------	1.83E-02
CE-141	Not Detected	--------	3.54E-02
CE-144	Not Detected	--------	1.48E-01
CO-56	Not Detected	--------	2.89E-02
CO-57	Not Detected	--------	1.98E-02
CO-58	Not Detected	--------	1.98E-02
CO-60	Not Detected	--------	2.28E-02
CR-51	Not Detected	--------	1.66E-01
CS-134	Not Detected	--------	2.36E-02
CS-137	Not Detected	--------	2.16E-02
CU-64	Not Detected	--------	3.22E+03
EU-152	Not Detected	--------	5.52E-02
EU-154	Not Detected	--------	9.91E-02
EU-155	Not Detected	--------	8.15E-02
FE-59	Not Detected	--------	4.06E-02
GD-153	Not Detected	--------	6.75E-02
HG-203	Not Detected	--------	1.88E-02
I-131	Not Detected	--------	2.79E-02
IN-115m	Not Detected	--------	2.93E+06
IR-192	Not Detected	--------	1.82E-02
K-40	Not Detected	--------	3.08E-01
LA-140	Not Detected	--------	1.36E-01
MN-54	Not Detected	--------	2.23E-02
MN-56	Not Detected	--------	1.86E+12
MO-99	Not Detected	--------	5.46E-01
NA-22	Not Detected	--------	1.67E-02
NA-24	Not Detected	--------	5.49
NB-95	Not Detected	--------	1.54E-01
ND-147	Not Detected	--------	1.67E-01
NI-57	Not Detected	--------	2.86E-01
BE-07	Not Detected	--------	1.71E-01
RU-103	Not Detected	--------	2.09E-02
RU-106	Not Detected	--------	1.90E-01
SB-122	Not Detected	--------	9.22E-02
SB-124	Not Detected	--------	2.30E-02
SB-125	Not Detected	--------	5.59E-02
SC-46	Not Detected	--------	2.50E-02
SR-85	Not Detected	--------	2.94E-02
TA-182	Not Detected	--------	7.20E-02
TA-183	Not Detected	--------	5.35E-01
TE-132	Not Detected	--------	4.68E-02
TL-201	Not Detected	--------	2.50E-01
V-48	Not Detected	--------	2.51E-02
XE-133	Not Detected	--------	3.12E-01
Y-88	Not Detected	--------	2.79E-02
ZN-65	Not Detected	--------	4.76E-02
ZR-95	Not Detected	--------	4.11E-02

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
5-11-96 2:21:01 PM
*
****

* Analyzed by: 5/14/96 Reviewed by: 5/14/96 *

****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 029265-02
Lab Sample ID : 60059416

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 826.000 gram
Sample Date/Time : 5-06-96 1:55:00 PM
Acquire Start Date : 5-11-96 12:38:00 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	9.24	3.52	4.18
TH-234	1.10E+01	2.28	6.41E-01
RA-226	Not Detected	--------	9.82E-01
PB-214	6.22E-01	1.02E-01	6.46E-02
BI-214	6.04E-01	9.81E-02	5.13E-02
TH-232	7.70E-01	3.68E-01	2.05E-01
RA-228	9.39E-01	1.95E-01	1.18E-01
AC-228	9.13E-01	1.66E-01	9.71E-02
TH-228	7.18E-01	2.29E-01	4.23E-01
RA-224	8.44E-01	2.11E-01	7.63E-02
PB-212	8.82E-01	1.55E-01	3.84E-02
BI-212	9.17E-01	3.88E-01	5.57E-01
TL-208	7.94E-01	1.36E-01	1.04E-01
U-235	5.89E-01	2.00E-01	2.77E-01
TH-231	Not Detected	--------	3.18
PA-231	Not Detected	--------	1.38
TH-227	Not Detected	--------	3.53E-01
RA-223	Not Detected	--------	2.80E-01
RN-219	Not Detected	--------	3.65E-01
PB-211	Not Detected	--------	8.68E-01
TL-207	Not Detected	--------	1.25E+01
AM-241	Not Detected	--------	5.95E-01
PU-239	Not Detected	--------	4.68E+02
NP-237	Not Detected	--------	3.15E-01
PA-233	Not Detected	--------	5.58E-02
TH-229	Not Detected	--------	3.12E-01

[Summary Report] - Sample ID: 60059416

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.81E-02
AG-110m	Not Detected	--------	3.46E-02
AR-41	Not Detected	--------	1.66E+18
BA-133	Not Detected	--------	5.63E-02
BA-140	Not Detected	--------	1.30E-01
CD-109	Not Detected	--------	1.09
CD-115	Not Detected	--------	2.85E-01
CE-139	Not Detected	--------	3.20E-02
CE-141	Not Detected	--------	6.55E-02
CE-144	Not Detected	--------	2.45E-01
CO-56	Not Detected	--------	3.30E-02
CO-57	Not Detected	--------	3.37E-02
CO-58	Not Detected	--------	2.92E-02
CO-60	Not Detected	--------	3.40E-02
CR-51	Not Detected	--------	2.42E-01
CS-134	Not Detected	--------	4.50E-02
CS-137	7.43E-02	2.14E-02	1.95E-02
CU-64	Not Detected	--------	4.55E+03
EU-152	Not Detected	--------	8.20E-02
EU-154	Not Detected	--------	1.70E-01
EU-155	Not Detected	--------	1.48E-01
FE-59	Not Detected	--------	7.09E-02
GD-153	Not Detected	--------	1.29E-01
HG-203	Not Detected	--------	2.98E-02
I-131	Not Detected	--------	3.83E-02
IN-115m	Not Detected	--------	6.41E+06
IR-192	Not Detected	--------	2.75E-02
K-40	1.81E+01	2.46	3.11E-01
LA-140	Not Detected	--------	2.53E-01
MN-54	Not Detected	--------	1.56E-02
MN-56	Not Detected	--------	2.85E+12
MO-99	Not Detected	--------	8.55E-01
NA-22	Not Detected	--------	3.90E-02
NA-24	Not Detected	--------	7.61
NB-95	Not Detected	--------	4.26E-01
ND-147	Not Detected	--------	2.50E-01
NI-57	Not Detected	--------	4.50E-01
BE-07	Not Detected	--------	2.40E-01
RU-103	Not Detected	--------	2.69E-02
RU-106	Not Detected	--------	2.68E-01
SB-122	Not Detected	--------	1.32E-01
SB-124	Not Detected	--------	2.91E-02
SB-125	Not Detected	--------	7.88E-02
SC-46	Not Detected	--------	4.93E-02
SR-85	Not Detected	--------	3.59E-02
TA-182	Not Detected	--------	1.43E-01
TA-183	Not Detected	--------	1.01
TE-132	Not Detected	--------	7.54E-02
TL-201	Not Detected	--------	5.34E-01
V-48	Not Detected	--------	3.79E-02
XE-133	Not Detected	--------	6.80E-01
Y-88	Not Detected	--------	2.48E-02
ZN-65	Not Detected	--------	9.50E-02
ZR-95	Not Detected	--------	5.88E-02

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* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program [881 Laboratory]
* 5-12-96 12:37:06 PM
*
* Analyzed by: 5/14/96 Reviewed by: 5/14/96
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60059417

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 5-12-96 12:24:58 PM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:

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Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.30E+04
TH-234	Not Detected	--------	4.84E+03
RA-226	Not Detected	--------	6.43E+03
PB-214	Not Detected	--------	6.42E+02
BI-214	Not Detected	--------	6.08E+02
TH-232	Not Detected	--------	2.03E+03
RA-228	Not Detected	--------	2.88E+03
AC-228	Not Detected	--------	1.62E+03
TH-228	Not Detected	--------	4.89E+04
RA-224	Not Detected	--------	8.85E+02
PB-212	Not Detected	--------	3.64E+03
BI-212	Not Detected	--------	3.49E+04
TL-208	Not Detected	--------	6.87E+03
U-235	Not Detected	--------	1.77E+03
TH-231	Not Detected	--------	1.73E+04
PA-231	Not Detected	--------	1.39E+04
TH-227	Not Detected	--------	2.33E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.25E+03
PB-211	Not Detected	--------	1.17E+04
TL-207	Not Detected	--------	2.21E+05
AM-241	9.28E+04	1.58E+04	6.41E+03
PU-239	Not Detected	--------	3.43E+06
NP-237	Not Detected	--------	2.59E+03
PA-233	Not Detected	--------	5.79E+02
TH-229	Not Detected	--------	2.10E+03

[Summary Report] - Sample ID: 60059417

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-108m	Not Detected	--------	3.48E+02
AG-110m	Not Detected	--------	4.12E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.52E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.33E+05	1.40E+05	2.01E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	6.15E+06
CE-141	Not Detected	--------	2.00E+21
CE-144	Not Detected	--------	2.53E+05
CO-56	Not Detected	--------	2.92E+10
CO-57	Not Detected	--------	4.42E+04
CO-58	Not Detected	--------	1.32E+11
CO-60	7.28E+04	9.49E+03	5.20E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	1.85E+03
CS-137	6.71E+04	8.68E+03	4.18E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.19E+03
EU-154	Not Detected	--------	2.39E+03
EU-155	Not Detected	--------	2.38E+03
FE-59	Not Detected	--------	3.99E+16
GD-153	Not Detected	--------	2.66E+05
HG-203	Not Detected	--------	2.86E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	4.65E+10
K-40	Not Detected	--------	1.54E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.38E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	1.01E+03
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	8.19E+14
RU-103	Not Detected	--------	9.95E+17
RU-106	Not Detected	--------	1.30E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	3.59E+12
SB-125	Not Detected	--------	4.28E+03
SC-46	Not Detected	--------	8.12E+09
SR-85	Not Detected	--------	7.93E+11
TA-182	Not Detected	--------	2.50E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	8.72E+07
ZN-65	Not Detected	--------	2.92E+05
ZR-95	Not Detected	--------	1.82E+12

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
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Report Date : 5-12-96 12:39:50 PM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 60059417
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 5-12-96 12:24:58 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.300E-02	3.950E-03	9.280E-02	<			>
CS-137 Activity	6.847E-02	2.030E-03	6.707E-02	<			>
CO-60 Activity	7.501E-02	1.560E-03	7.325E-02	<	In		>

DIC 5/14/96

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 5/14/96

SF 2001-COC (6-95)

Internal Lab Batch No. ____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

AR/COC- 05085

Dept. No./Mail Stop: 7585/MS 1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1333/58/DAT
Logbook Ref No: 0155
Service Order No.: CF0180

Date Samples Shipped: 5/7/96 (SMO USE)
Carrier/Waybill No.: [illegible]
Lab Contact: Edie N Kent
Lab Destination: Gen Eng Lab
SMO Contact/Phone: Doug Salmi/843-0763
Send Report to SMO: Kathy Becker

Contract No.: AJ4848A
Case No.: 7223.402
SMO Authorization: [signature]
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Location Tech Area III
Building N/A Room N/A

Reference LOV (available at SMO)

Parameter & Method Requested: High Explosive

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	High Explosive	Lab Sample ID
029244-01	58X-GR-001-.5'-SS	.5'	58	5/6/96 1020	Soil	AG	250	4°C	G	SA	X	
029245-01	58X-GR-001-.5'-SSD	.5'	58	1021	Soil	AG	250	4°C	G	DU	X	
029246-01	58X-GR-002-.5'-SS	.5'	58	1024	Soil	AG	250	4°C	G	SA	X	
029247-01	58X-GR-003-.5'-SS	.5'	58	1030	Soil	AG	250	4°C	G	SA	X	
029248-01	58X-GR-004-.5'-SS	.5'	58	1032	Soil	AG	250	4°C	G	SA	X	
029249-01	58X-GR-005-.5'-SS	.5'	58	1037	Soil	AG	250	4°C	G	SA	X	
029250-01	58X-GR-006-.5'-SS	.5'	58	1041	Soil	AG	250	4°C	G	SA	X	
029251-01	58X-GR-007-.5'-SS	.5'	58	1051	Soil	AG	250	4°C	G	SA	X	
029252-01	58X-GR-008-.5'-SS	.5'	58	1054	Soil	AG	250	4°C	G	SA	X	
029253-01	58X-GR-009-.5'-SS	.5'	58	1100	Soil	AG	250	4°C	G	SA	X	

RMMA ☒ Yes ☐ No Ref. No. ____
Sample Disposal ☒ Return to Client ☐ Disposal by lab
Turnaround Time ☒ Normal ☐ Rush Required Report Date ____

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ____
Entered by: ____
QC inits. ____

Special Instructions/QC Requirements
- Please send separate report to Mike Young.
- This COC# 05085 will be released by COC#05114

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members: Name	Signature	Init	Company/Organization/Phone
Canetta Cacciato	[signature]	cc	Lamb/7584/284-2561
[illegible]	[signature]	[illegible]	"

	Org.	Date	Time		Org.	Date	Time
1. Relinquished by [signature]	7584	5/7/96	8:25	4. Relinquished by			
1. Received by [signature]	7513	5/7/96	825	4. Received by			
2. Relinquished by [signature]	7513	5/8/96	1000	5. Relinquished by			
2. Received by				5. Received by			
3. Relinquished by				6. Relinquished by			
3. Received by				6. Received by			

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

ER Site 58X

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

PAGE ___ OF ___

AR/COC- 05085

Project Name: Foothills Test Area Project/Task Manager: Mike Young Case No.: 3622.400

Location Tech Area III Building N/A Room N/A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Parameter & Method Requested										Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	High Explosive	Tio Uranium	Thorium	CA-13/							
029254-01	58X-GR-010-.5'-SS	.5'	58	5/6/96 1102	Soil	2G	250	4°	G	SA	X										
029255-01	58X-GR-011-.5'-SS	.5'	58	1109	Soil	2G	250	4°	G	SA	X										
029256-01	58X-GR-012-.5'-SS	.5'	58	1110	Soil	2G	250	4°	G	SA	X										
029257-01	58X-GR-013-.5'-SS	.5'	58	1117	Soil	2G	250	4°	G	SA	X										
029258-01	58X-GR-014-.5'-SS	.5'	58	1118	Soil	2G	250	4°	G	SA	X										LAB USE
029259-01	58X-GR-015-.5'-SS	.5'	58	1124	Soil	2G	250	4°	G	SA	X										
029260-01	58X-GR-016-.5'-SS	.5'	58	1126	Soil	2G	250	4°	G	SA	X										
029261-01	58X-GR-016-EB	—	58	1305	DIW	2G	2x1L	4°	G	EB	X										
029262-01	58X-GR-016-FB	—	58	1300	DIW	2G	2x1L	4°	G	FB	X										
029265-01	58X-GR-017-.5-SS	.5	58	1355	Soil	4oz	250	1/0	G	SA	X										
029263-03	58X-GR-005-.5-SS			1353			500ml	none				X									
029264-04	58X-GR-005-.5-SS			1353									X								
029265-05	58X-GR-005-.5-SS	↓	↓	1353	↓	↓	↓	↓	↓	↓				X							

Abnormal Conditions on Receipt

Recipient Initials _____

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: May 30, 1996

Sample ID	: 029266-03 58X-GR-005-.5-SS
Lab ID	: 9605170-21
Matrix	: SOIL
Date Collected	: 05/06/96
Date Received	: 05/09/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Uranium - 3 items												
Uranium-233/234	B	2.98	+/- 0.0186	.09	0.0289	pCi/g	1.0	PEM	05/22/96	1345	84573	1
Uranium-235		0.232	+/- 0.0186	.09	0.00	pCi/g	1.0					
Uranium-238	B	3.00	+/- 0.0186	.09	0.0236	pCi/g	1.0					

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	EPI A-011B

GEL Laboratory Certifications **EPI Laboratory Certifications**

Printed on recycled paper.

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: May 30, 1996

Sample ID : 029266-03 58X-GR-005-.5-SS

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

P O Box 30712 • Charleston, SC 29417 • (803) 556-8171 • Fax (803) 766-1178

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GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395

Report Date: May 24, 1996

Sample ID	: 029266-04 58X-GR-005-.5-SS
Lab ID	: 9605170-22
Matrix	: SOIL
Date Collected	: 05/06/96
Date Received	: 05/09/96
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Alpha Spectroscopy Thorium - 3 items												
Thorium-228		1.21	+/- 0.21	.04	0.139	pCi/g	1.0	PCW	05/21/96	1407	84575	1
Thorium-230	B	1.07	+/- 0.182	.04	0.0451	pCi/g	1.0					
Thorium-232	B	1.06	+/- 0.181	.04	0.0451	pCi/g	1.0					

Comments:

DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

M = Method	Method-Description
M 1	HASL 300

GEL Laboratory Certifications **EPI Laboratory Certifications**

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GENERAL ENGINEERING LABORATORIES

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: May 24, 1996

Sample ID : 029266-04 58X-GR-005-.5-SS

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331
Contact: Mr. Doug Salmi
Project Description: RFP #AJ2480A

cc: SNLS00395 Report Date: May 29, 1996

Sample ID : 029266-05 58X-GR-005-.5-SS
Lab ID : 9605170-23
Matrix : SOIL
Date Collected : 05/06/96
Date Received : 05/09/96
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological												
Gamma PHA - 21 items												
Actinium-228		1.08	+/- 0.175	1	0.134	pCi/g	1.0	SCM	05/21/96	1528	84807	1
Americium-241	U	0.000798	+/- 0.171	2	0.219	pCi/g	1.0					
Cerium-144	U	-0.0815	+/- 0.142	.5	0.241	pCi/g	1.0					
Cesium-134	U	-0.00530	+/- 0.0217	.1	0.0332	pCi/g	1.0					
Cesium-137		0.790	+/- 0.0672	.04	0.0428	pCi/g	1.0					
Chromium-51	U	0.0960	+/- 0.222	1	0.382	pCi/g	1.0					
Cobalt-60	U	0.0124	+/- 0.024	.1	0.0457	pCi/g	1.0					
Iron-59	U	-0.00551	+/- 0.0564	1	0.0967	pCi/g	1.0					
Lead-212		1.13	+/- 0.0741	1	0.0553	pCi/g	1.0					
Lead-214	U	0.946	+/- 0.106	1	0.0749	pCi/g	1.0					
Potassium-40		21.2	+/- 1.12	1	0.318	pCi/g	1.0					
Radium-226	U	0.837	+/- 0.0969	1	0.0711	pCi/g	1.0					
Radium-228		1.08	+/- 0.175	1	0.134	pCi/g	1.0					
Ruthenium-103	U	0.0181	+/- 0.0444	1	0.0421	pCi/g	1.0					
Ruthenium-106	U	0.0490	+/- 0.198	.8	0.317	pCi/g	1.0					
Thorium-231	U	0.00	+/- 0	1	0.212	pCi/g	1.0					
Thorium-232	U	1.12	+/- 0.073	2	0.0545	pCi/g	1.0					
Thorium-234		40.3	+/- 2.82	5	1.71	pCi/g	1.0					
Uranium-235		2.21	+/- 0.306	1	0.372	pCi/g	1.0					
Uranium-238		40.3	+/- 2.82	5	1.71	pCi/g	1.0					
Zirconium-95	U	0.0283	+/- 0.042	1	0.0771	pCi/g	1.0					

Comments:
DL = Contract- specific critical level for radiochemistry test.

RL = MDA for radiochemistry test.

CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: May 29, 1996

Sample ID : 029266-05 58X-GR-005-.5-SS

M = Method	Method-Description
M 1	HASL 300

GEL Laboratory Certifications		EPI Laboratory Certifications	
AL - 41040	AZ - AZ0514	AL - 41050	AZ - AZ0514
CA - 2089	CT - PH-0169	CA - I-1023/2056	CT - PH-0175
DE - SC012	FL - E87156/87294	FL - E87472/87458	MS - 29417
ME - SC012	MS - 10120	NY - 11502	RI - 138
NC - 233	NY - 11501	SC - 10582	TN - 02934
RI - 135	SC - 10120	UT - E-227	VA - 00111
TN - 02934	UT - E-251	WA - C225	NJ - 79002
VA - 00151	WA - C223	PA - 68-485	WV - 235
WI - 999887790			

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Meeting today's needs with a vision for tomorrow.

CERTIFICATE OF ANALYSIS

Client:	Sandia National Laboratories
	PO Box 5800
	Albuquerque, New Mexico 87185-1331
Contact:	Mr. Doug Salmi
Project Description:	RFP #AJ2480A

cc: SNLS00395 Report Date: May 29, 1996

Sample ID : 029266-05 58X-GR-005-.5-SS

GEL Laboratory Certifications **EPI Laboratory Certifications**

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.

Analytical Report Specialist

9605170-23 P O Box 30712 • Charleston, SC 29417 • (803) 556-8171 • Fax (803) 766-1178

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ER SITE 58A

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

Internal Lab Batch No. 600593

SF 2001-COC (6-95)

AR/COC- 05114

Dept. No./Mail Stop: 7585/ms 1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No: 0155
Service Order No.: CF-0180

Date Samples Shipped: 5-7-96 (SMO USE)
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: RFSD Building 881
SMO Contact/Phone: Doug Salmi/848-0962
Send Report to SMO Kathy Becker

Contract No.: N/A
Case No.: 21628.400
SMO Authorization: Mary L
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location Tech Area III
Building N/A Room N/A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: Gamma Spec	Lab Sample ID
029249-02	58X-GR-005-.5'-SS	.5'	58	5/6/96 1057	Soil	Poly	500	none	G	SA	X	
029254-02	58X-GR-010-.5'-SS	.5'	58	" 1102	Soil	Poly	500	none	G	SA	X	
029259-02	58X-GR-015-.5'-SS	.5'	58	" 1114	Soil	Poly	500	none	G	SA	X	

LAB USE

RMMA ☒ Yes ☐ No Ref. No. _____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush Required Report Date _____

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) _____
Entered by: _____
QC inits. _____

Special Instructions/QC Requirements
- Please send separate report to MIKE YOUNG.
- NEED 24 HOUR TURN-A-ROUND
- THIS COC# 05114 will release COC# 05085 to GEL
- THIS IS AN RMMA

Abnormal Conditions on Receipt LAB USE

Sample Team Members

Name	Signature	Init	Company/Organization/Phone
Concetta Cacciotti	Concetta Cacciotti	CC	Lamb/7594/284-3301
Kiran DeLuca	Kiran DeLuca	KD	" " "

1. Relinquished by		Org. 7594	Date 5/7/96	Time 0825	4. Relinquished by	Org.	Date	Time
1. Received by		Org. 7513	Date 5/7/96	Time 0825	4. Received by	Org.	Date	Time
2. Relinquished by		Org. 7513	Date 5/7/96	Time 0845	5. Relinquished by	Org.	Date	Time
2. Received by		Org. 3617713	Date 5/7/96	Time 0845	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

ER/1332/58/DAT

SMO ANALYTICAL DATA ROUTING FORM

Project Name: FOOTHILLS TEST AREA Case Number: 3622.400

SNL Task Leader: BYRD/YOUNG Org/Mail Stop: 7585/11418

SMO Project Coordinator: SALAZAR Sample Ship Date: 5/7/96

ARCOC	Lab	Lab ID
05114	7213	600593

Date Results Received:

Preliminary: _____ Final: 5/8/96

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____ Reviewer: _____

Date Review Complete: _____ Signature: _____

Date of Preliminary Notification: _____ Person Notified: _____

Date of Final Transmittal: 5/22/96 Transmitted To: ~~P~~ YOUNG

Transmitted By: [signature] Filed In Record Center: [signature]

Comments: _____

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-07-96 10:47:46 AM *
****
*
* Analyzed by: 5/8/96 Reviewed by: 5/7/96 *
****

Customer : MIKE YOUNG (7585/RMMA)
Customer Sample ID : 029249-02
Lab Sample ID : 60059301

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 789.000 gram
Sample Date/Time : 5-06-96 10:39:00 AM
Acquire Start Date : 5-07-96 8:58:28 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6006 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	4.68E+01	1.24E+01	2.56
TH-234	4.33E+01	8.14	6.78E-01
RA-226	Not Detected	--------	1.18
PB-214	6.59E-01	1.48E-01	9.58E-02
BI-214	5.71E-01	1.04E-01	5.97E-02
TH-232	8.08E-01	4.02E-01	2.13E-01
RA-228	8.49E-01	3.39E-01	1.79E-01
AC-228	8.70E-01	1.87E-01	1.69E-01
TH-228	8.28E-01	4.20E-01	5.84E-01
RA-224	1.01	2.76E-01	1.22E-01
PB-212	8.59E-01	1.92E-01	4.25E-02
BI-212	8.64E-01	3.83E-01	5.44E-01
TL-208	8.07E-01	1.51E-01	1.06E-01
U-235	2.42	4.11E-01	3.06E-01
TH-231	Not Detected	--------	3.06
PA-231	Not Detected	--------	1.50
TH-227	Not Detected	--------	3.68E-01
RA-223	Not Detected	--------	2.35E-01
RN-219	Not Detected	--------	4.42E-01
PB-211	Not Detected	--------	1.02
TL-207	Not Detected	--------	1.49E+01
AM-241	Not Detected	--------	2.96E-01
PU-239	Not Detected	--------	4.76E+02
NP-237	Not Detected	--------	4.35E-01
PA-233	Not Detected	--------	6.51E-02
TH-229	Not Detected	--------	3.27E-01

[Summary Report] - Sample ID: 60059301

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.61E-02
AG-110m	Not Detected	--------	7.66E-02
AR-41	Not Detected	--------	2.92E+02
BA-133	Not Detected	--------	6.38E-02
BA-140	Not Detected	--------	1.34E-01
CD-109	Not Detected	--------	1.19
CD-115	Not Detected	--------	9.75E-02
CE-139	Not Detected	--------	3.91E-02
CE-141	Not Detected	--------	7.74E-02
CE-144	Not Detected	--------	2.59E-01
CO-56	Not Detected	--------	3.67E-02
CO-57	Not Detected	--------	3.48E-02
CO-58	Not Detected	--------	3.64E-02
CO-60	Not Detected	--------	3.94E-02
CR-51	Not Detected	--------	2.64E-01
CS-134	Not Detected	--------	5.23E-02
CS-137	6.27E-01	9.82E-02	5.23E-02
CU-64	Not Detected	--------	2.88E+01
EU-152	Not Detected	--------	1.00E-01
EU-154	Not Detected	--------	1.98E-01
EU-155	Not Detected	--------	1.46E-01
FE-59	Not Detected	--------	7.44E-02
GD-153	Not Detected	--------	1.34E-01
HG-203	Not Detected	--------	3.10E-02
I-131	Not Detected	--------	3.63E-02
IN-115m	Not Detected	--------	2.61
IR-192	Not Detected	--------	3.09E-02
K-40	1.77E+01	2.46	4.31E-01
LA-140	Not Detected	--------	6.19E-02
MN-54	Not Detected	--------	3.87E-02
MN-56	Not Detected	--------	1.84E+01
MO-99	Not Detected	--------	4.28E-01
NA-22	Not Detected	--------	4.77E-02
NA-24	Not Detected	--------	1.05E-01
NB-95	Not Detected	--------	2.06E-01
ND-147	Not Detected	--------	2.54E-01
NI-57	Not Detected	--------	7.96E-02
BE-07	Not Detected	--------	3.04E-01
RU-103	Not Detected	--------	3.35E-02
RU-106	Not Detected	--------	3.57E-01
SB-122	Not Detected	--------	6.05E-02
SB-124	Not Detected	--------	3.51E-02
SB-125	Not Detected	--------	9.73E-02
SC-46	Not Detected	--------	5.56E-02
SR-85	Not Detected	--------	4.23E-02
TA-182	Not Detected	--------	1.62E-01
TA-183	Not Detected	--------	2.84E-01
TE-132	Not Detected	--------	3.63E-02
TL-201	Not Detected	--------	1.67E-01
V-48	Not Detected	--------	4.05E-02
XE-133	Not Detected	--------	1.83E-01
Y-88	Not Detected	--------	3.19E-02
ZN-65	Not Detected	--------	1.05E-01
ZR-95	Not Detected	--------	7.07E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-07-96 1:22:56 PM *
****
*
* Analyzed by: 5/8/96 Reviewed by: 5/7/96 *
****

Customer : MIKE YOUNG (7585)
Customer Sample ID : 029254-02
Lab Sample ID : 60059302

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 873.000 gram
Sample Date/Time : 5-06-96 11:02:00 AM
Acquire Start Date : 5-07-96 11:33:42 AM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
✓U-238	2.28	1.07	1.40
TH-234	1.98	4.47E-01	3.52E-01
RA-226	Not Detected	--------	7.18E-01
PB-214	5.73E-01	1.23E-01	5.71E-02
BI-214	6.08E-01	1.09E-01	6.42E-02
TH-232	7.49E-01	3.48E-01	1.28E-01
RA-228	7.98E-01	1.97E-01	1.52E-01
AC-228	8.37E-01	1.60E-01	9.99E-02
TH-228	5.78E-01	3.43E-01	4.97E-01
RA-224	9.03E-01	2.41E-01	6.29E-02
PB-212	8.39E-01	1.82E-01	3.49E-02
BI-212	9.30E-01	3.03E-01	3.80E-01
TL-208	8.31E-01	1.50E-01	9.52E-02
U-235	1.15E-01	1.01E-01	1.60E-01
TH-231	Not Detected	--------	1.43
PA-231	Not Detected	--------	1.17
TH-227	Not Detected	--------	3.33E-01
RA-223	Not Detected	--------	1.05E-01
RN-219	Not Detected	--------	3.38E-01
PB-211	Not Detected	--------	7.88E-01
TL-207	Not Detected	--------	1.41E+01
AM-241	Not Detected	--------	1.41E-01
PU-239	Not Detected	--------	3.05E+02
NP-237	Not Detected	--------	1.64E-01
PA-233	Not Detected	--------	5.20E-02
TH-229	Not Detected	--------	1.62E-01

[Summary Report] - Sample ID: 60059302

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.00E-02
AG-110m	Not Detected	--------	3.57E-02
AR-41	Not Detected	--------	6.25E+02
BA-133	Not Detected	--------	5.20E-02
BA-140	Not Detected	--------	1.03E-01
CD-109	Not Detected	--------	5.65E-01
CD-115	Not Detected	--------	8.42E-02
CE-139	Not Detected	--------	2.35E-02
CE-141	Not Detected	--------	3.84E-02
CE-144	Not Detected	--------	1.64E-01
CO-56	Not Detected	--------	3.02E-02
CO-57	Not Detected	--------	2.04E-02
CO-58	Not Detected	--------	2.88E-02
CO-60	Not Detected	--------	3.75E-02
CR-51	Not Detected	--------	2.07E-01
CS-134	Not Detected	--------	4.83E-02
CS-137	5.44E-02	2.16E-02	2.95E-02
CU-64	Not Detected	--------	2.79E+01
EU-152	Not Detected	--------	8.35E-02
EU-154	Not Detected	--------	1.73E-01
EU-155	Not Detected	--------	8.20E-02
FE-59	Not Detected	--------	7.26E-02
GD-153	Not Detected	--------	6.29E-02
HG-203	Not Detected	--------	2.47E-02
I-131	Not Detected	--------	2.93E-02
IN-115m	Not Detected	--------	3.07
IR-192	Not Detected	--------	2.52E-02
K-40	1.71E+01	2.37	3.23E-01
LA-140	Not Detected	--------	5.51E-02
MN-54	Not Detected	--------	1.55E-02
MN-56	Not Detected	--------	2.73E+01
MO-99	Not Detected	--------	3.17E-01
NA-22	Not Detected	--------	4.21E-02
NA-24	Not Detected	--------	1.03E-01
NB-95	Not Detected	--------	1.90E-01
ND-147	Not Detected	--------	1.96E-01
NI-57	Not Detected	--------	7.55E-02
BE-07	Not Detected	--------	2.27E-01
RU-103	Not Detected	--------	2.57E-02
RU-106	Not Detected	--------	2.86E-01
SB-122	Not Detected	--------	5.20E-02
SB-124	Not Detected	--------	2.97E-02
SB-125	Not Detected	--------	7.68E-02
SC-46	Not Detected	--------	5.36E-02
SR-85	Not Detected	--------	3.56E-02
TA-182	Not Detected	--------	1.56E-01
TA-183	Not Detected	--------	1.36E-01
TE-132	Not Detected	--------	2.79E-02
TL-201	Not Detected	--------	8.74E-02
V-48	Not Detected	--------	3.58E-02
XE-133	Not Detected	--------	8.92E-02
Y-88	Not Detected	--------	2.75E-02
ZN-65	Not Detected	--------	1.03E-01
ZR-95	Not Detected	--------	5.49E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-07-96 3:16:35 PM *
****
*
* Analyzed by: 5/8/96 Reviewed by: 5/7/96 *
****

Customer : MIKE YOUNG (7585)
Customer Sample ID : 029259-02
Lab Sample ID : 60059303

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 813.000 gram
Sample Date/Time : 5-06-96 11:24:00 AM
Acquire Start Date : 5-07-96 1:32:04 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6005 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	1.73E+01	4.72	2.10
TH-234	1.64E+01	3.11	4.63E-01
RA-226	Not Detected	--------	6.50E-01
PB-214	6.46E-01	1.41E-01	7.95E-02
BI-214	6.09E-01	1.10E-01	6.66E-02
TH-232	7.53E-01	3.68E-01	1.59E-01
RA-228	8.42E-01	2.78E-01	1.68E-01
AC-228	7.91E-01	1.59E-01	1.18E-01
TH-228	7.46E-01	4.11E-01	5.86E-01
RA-224	1.00	2.68E-01	8.43E-02
PB-212	8.63E-01	1.97E-01	4.21E-02
BI-212	9.12E-01	3.28E-01	4.31E-01
TL-208	7.83E-01	1.51E-01	1.18E-01
U-235	8.23E-01	2.07E-01	2.52E-01
TH-231	Not Detected	--------	2.20
PA-231	Not Detected	--------	1.40
TH-227	Not Detected	--------	3.60E-01
RA-223	Not Detected	--------	1.64E-01
RN-219	Not Detected	--------	4.05E-01
PB-211	Not Detected	--------	9.20E-01
TL-207	Not Detected	--------	1.44E+01
AM-241	Not Detected	--------	2.10E-01
PU-239	Not Detected	--------	3.83E+02
NP-237	Not Detected	--------	3.10E-01
PA-233	Not Detected	--------	6.05E-02
TH-229	Not Detected	--------	2.36E-01

[Summary Report] - Sample ID: 60059303

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.22E-02
AG-110m	Not Detected	--------	7.62E-02
AR-41	Not Detected	--------	1.14E+03
BA-133	Not Detected	--------	5.72E-02
BA-140	Not Detected	--------	1.19E-01
CD-109	Not Detected	--------	8.14E-01
CD-115	Not Detected	--------	9.49E-02
CE-139	Not Detected	--------	3.09E-02
CE-141	Not Detected	--------	5.55E-02
CE-144	Not Detected	--------	2.05E-01
CO-56	Not Detected	--------	3.19E-02
CO-57	Not Detected	--------	2.71E-02
CO-58	Not Detected	--------	3.50E-02
CO-60	Not Detected	--------	3.80E-02
CR-51	Not Detected	--------	2.38E-01
CS-134	Not Detected	--------	5.27E-02
CS-137	6.70E-01	1.03E-01	5.09E-02
CU-64	Not Detected	--------	3.25E+01
EU-152	Not Detected	--------	9.47E-02
EU-154	Not Detected	--------	1.79E-01
EU-155	Not Detected	--------	1.09E-01
FE-59	Not Detected	--------	7.83E-02
GD-153	Not Detected	--------	9.32E-02
HG-203	Not Detected	--------	2.84E-02
I-131	Not Detected	--------	3.28E-02
IN-115m	Not Detected	--------	4.35
IR-192	Not Detected	--------	2.82E-02
K-40	1.67E+01	2.32	4.08E-01
LA-140	Not Detected	--------	6.58E-02
MN-54	Not Detected	--------	3.71E-02
MN-56	Not Detected	--------	4.44E+01
MO-99	Not Detected	--------	3.65E-01
NA-22	Not Detected	--------	4.31E-02
NA-24	Not Detected	--------	1.14E-01
NB-95	Not Detected	--------	2.08E-01
ND-147	Not Detected	--------	2.31E-01
NI-57	Not Detected	--------	7.83E-02
BE-07	Not Detected	--------	2.76E-01
RU-103	Not Detected	--------	3.06E-02
RU-106	Not Detected	--------	3.21E-01
SB-122	Not Detected	--------	5.62E-02
SB-124	Not Detected	--------	3.52E-02
SB-125	Not Detected	--------	8.96E-02
SC-46	Not Detected	--------	5.36E-02
SR-85	Not Detected	--------	4.00E-02
TA-182	Not Detected	--------	1.60E-01
TA-183	Not Detected	--------	2.07E-01
TE-132	Not Detected	--------	3.33E-02
TL-201	Not Detected	--------	1.27E-01
V-48	Not Detected	--------	3.85E-02
XE-133	Not Detected	--------	1.38E-01
Y-88	Not Detected	--------	2.79E-02
ZN-65	Not Detected	--------	1.01E-01
ZR-95	Not Detected	--------	6.45E-02

```
**************************************************************************
*                    Sandia National Laboratories                        *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]   *
*                        5-07-96  3:28:22 PM                             *
**************************************************************************
*                                                                        *
* Analyzed by: [signature] 5/8/96          Reviewed by: [signature] 5/7/96 *
**************************************************************************
```

Customer : MIKE YOUNG (7585)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60059304

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 5-07-96 3:15:42 PM
Detector Name : LAB03
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Comments:

****

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	6.46E+03
TH-234	Not Detected	--------	2.74E+03
RA-226	Not Detected	--------	5.73E+03
PB-214	Not Detected	--------	7.10E+02
BI-214	Not Detected	--------	7.27E+02
TH-232	Not Detected	--------	2.16E+03
RA-228	Not Detected	--------	3.31E+03
AC-228	Not Detected	--------	1.93E+03
TH-228	Not Detected	--------	4.68E+04
RA-224	Not Detected	--------	2.16E+03
PB-212	Not Detected	--------	3.57E+03
BI-212	Not Detected	--------	3.77E+04
TL-208	Not Detected	--------	7.48E+03
U-235	Not Detected	--------	1.42E+03
TH-231	Not Detected	--------	9.20E+03
PA-231	Not Detected	--------	1.33E+04
TH-227	Not Detected	--------	2.30E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.47E+03
PB-211	Not Detected	--------	1.24E+04
TL-207	Not Detected	--------	2.48E+05
AM-241	8.65E+04	1.36E+04	2.08E+03
PU-239	Not Detected	--------	2.52E+06
NP-237	Not Detected	--------	1.45E+03
PA-233	Not Detected	--------	6.12E+02
TH-229	Not Detected	--------	1.28E+03

[Summary Report] - Sample ID: 60059304

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-108m	Not Detected	--------	3.75E+02
AG-110m	Not Detected	--------	4.67E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.15E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	2.99E+05	8.29E+04	9.99E+04
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	5.24E+06
CE-141	Not Detected	--------	1.47E+21
CE-144	Not Detected	--------	1.90E+05
CO-56	Not Detected	--------	3.24E+10
CO-57	Not Detected	--------	3.15E+04
CO-58	Not Detected	--------	1.48E+11
CO-60	7.32E+04	9.60E+03	6.87E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	2.13E+03
CS-137	6.70E+04	8.70E+03	7.12E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.28E+03
EU-154	Not Detected	--------	2.57E+03
EU-155	Not Detected	--------	1.50E+03
FE-59	Not Detected	--------	4.16E+16
GD-153	Not Detected	--------	1.56E+05
HG-203	Not Detected	--------	2.66E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	4.75E+10
K-40	Not Detected	--------	1.54E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.75E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	1.15E+03
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	8.28E+14
RU-103	Not Detected	--------	1.02E+18
RU-106	Not Detected	--------	1.50E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	3.93E+12
SB-125	Not Detected	--------	4.53E+03
SC-46	Not Detected	--------	8.88E+09
SR-85	Not Detected	--------	8.35E+11
TA-182	Not Detected	--------	2.78E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	8.82E+07
ZN-65	Not Detected	--------	3.34E+05
ZR-95	Not Detected	--------	1.89E+12

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 5-07-96 3:32:06 PM
QA File : C:\GENIEPC\CAMFILES\LCS3.QAF
Analyst : FCD
Sample ID : 60059304
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 5-07-96 3:15:42 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.658E-02	1.266E-02	8.654E-02	<	:	:	: >
CS-137 Activity	6.698E-02	5.391E-04	6.696E-02	<	:	:	: >
CO-60 Activity	7.428E-02	6.237E-04	7.391E-02	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 5/7/96

Feature 58Z

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COC (9-94) 500497

PAGE 1 OF 2

AR/COC- 03869

Dept. No./Mail Stop: 2585
Project/Task Manager: Mike Young
ADS 1332 Project Name: Scoping Sampling
Record Center Code:
Logbook Ref No: 1617
SMO Reference No.:

Date Sample(s) Shipped: 6-28-95
Carrier/Waybill No.: HC
Lab Contact: Amir Mohagheghi
Lab Destination: SNL 7715
SMO Contact/Phone: Mock
Send Report to SMO: Deborah McLaughlin

Contract No.: N/A
Case No.: 3628.600
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec

Location Tech Area Site 58
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
024807-1A	58-GR-001-0-55	0	58	6.27.95 1200	S	P	500ml	none	G	SA	
024808-1A	-002-			62795 1205							
024809-1A	-003-			62795 1209							
024810-1A	-004-			1212							
024811-1A	-005-			1220							
024812-1A	-006-			1225							
024813-1A	-007-			1238							
024814-1A	008			1241							
024815-1A	009			1245							
024816-1A	010	↓		1248	↓	↓	↓	↓	↓	↓	

LAB USE

RMMA ☐ Yes ☒ No Ref. No.:

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking — SNL/6 USE
Date Entered (mm/dd/yy):
Entered by:
QC inits:

Special Instructions/QC Requirements

Abnormal Conditions on Receipt — LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization
	Rod Nagel	Rod Nagel	RN	IT/7584
	Concetta Cocciolo	Concetta Cocciolo	CC	Lamb/7584

1. Relinquished by	Concetta Cocciolo	Org. 7884	Date 6.28.95	Time 9:00	4. Relinquished by	Org.	Date Time
1. Received by	D McLaughlin	Org. SMO 7513	Date 6/28/95	Time 0900	4. Received by	Org.	Date Time
2. Relinquished by		Org. SMO 7513	Date 6.28.95	Time 1325	5. Relinquished by	Org.	Date Time
2. Received by		Org. SNL 7715	Date 6/28/95	Time 1325	5. Received by	Org.	Date Time
3. Relinquished by		Org. SNL 7715	Date 7/5/95	Time 900	6. Relinquished by	Org.	Date Time
3. Received by	D McLaughlin	Org. SMO 7513	Date 7/5/95	Time 0900	6. Received by	Org.	Date Time

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

★ U.S. GOVERNMENT PRINTING OFFICE: 1994—673-447

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

AR/COC- 03869

Project Name: Scoping Sampling Project/Task Manager: Mike Young Case No.: 3628.600

Location Tech Area ____ Building ____ Room ____

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Parameter & Method Requested	Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	GAMMA SPEC.	
024817-1A	58-GR-010-0-SS	0	58	62195 1250	S	P	500 ml	none	G	SA	X	
024818-1A	012			1255							X	
024819-1A	013			1257							X	
024820-1A	014			1259							X	
024821-1A	015			1303							X	
024822-1A	016			1310							X	
024823-1A	017	↓	↓	1305	↓	↓	↓	↓	↓	↓	X	

LAB USE

Abnormal Conditions on Receipt

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 2

SF 2001-COC (9-94) 500497

AR/COC- 03869

Dept. No./Mail Stop: 2585
Project/Task Manager: Mike Young
ADS 1332 Project Name: Scoping Sampling
Record Center Code:
Logbook Ref No: 1617
SMO Reference No.:

Date Samples Shipped: 6-28-95 (LAB USE)
Carrier/Waybill No.: HC
Lab Contact: Amir Mohagheghi
Lab Destination: SNL 7715
SMO Contact/Phone: Mack
Send Report to SMO: Barbara McLaughlin

Contract No.: N/A
Case No.: 3628.600
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location Tech Area Site 58
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: Gamma Spec	Lab Sample ID
✓ 0248007-1A	58-GR-001-0-55	0	58	6.27.95 1200	S	P	500ml	none	G	SA	X	
✓ 0248008-1A	-002-			62795 1205							X	
✓ 0248009-1A	-003-			62795 1209							X	
✓ 0248010-1A	-004-			1212							X	
✓ 0248011-1A	-005-			1220							X	
✓ 0248012-1A	-006-			1235							X	
✓ 0248013-1A	-007-			1238							X	
✓ 0248014-1A	008			1241							X	
✓ 0248015-1A	009			1245							X	
✓ 0248016-1A	010	↓		1248	↓	↓	↓	↓	↓	↓	X	

RMMA ☐ Yes ☒ No Ref. No.:

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking (LAB USE)
Date Entered (mm/dd/yy): 7/12/95
Entered by: LAWZ
QC inits.

Special Instructions/QC Requirements

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members	Name	Signature	Init	Company/Organization
	Rod Nagel	Rod Nagel	RN	IT/7584
	Concetta Cocciolo	Concetta Cocciolo	CC	Lamb/7584

1. Relinquished by	Concetta Cocciolo	Org. 7584	Date 6.28.95	Time 9:00	4. Relinquished by	Org.	Date	Time
1. Received by	DMoore	Org. SMO 7513	Date 6/28/95	Time 0900	4. Received by	Org.	Date	Time
2. Relinquished by	DM Ed	Org. SMO 7513	Date 6-28-95	Time 1325	5. Relinquished by	Org.	Date	Time
2. Received by		Org. SNL 7715	Date 6/28/95	Time 1325	5. Received by	Org.	Date	Time
3. Relinquished by	Jennifer Fu	Org. SNL 7715	Date 7/5/95	Time 900	6. Relinquished by	Org.	Date	Time
3. Received by	DMoore	Org. SMO 7513	Date 7/5/95	Time 0900	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

AR/COC- 03869

500497

ADS B32

Project Name: Scoping Sampling Project/Task Manager: Mike Young Case No.: 3628.600

Location Tech Area SITE 58

Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: GAMMA SPEC.	Lab Sample ID
✓ 024817-1A	58-GR-010-0-SS	0	58	62195 1250	S	P	500 ml	none	G	SA	X	
✓ 024818-1A	012			1255							X	
✓ 024819-1A	013			1257							X	
✓ 024820-1A	014			1259							X	
✓ 024821-1A	015			1303							X	
✓ 024822-1A	016			1310							X	
✓ 024823-1A	017	↓	↓	1305	↓	↓	↓	↓	↓	↓	X	

Abnormal Conditions on Receipt

Recipient Initials

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Mike Koury
Organization: 7585
Project Location: ER Site 58
Phone: 848-0389
Date Results Needed:
Suspect Isotopes: unknown
Other Information: 03860

Hazards/Special Instructions:

Batch Log Number: 500501
Logged By: Tom

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
024824-1	soil	6-28-95 1215	500 ml	Gamma Spec	01		823	Det 2
024825-1		1240			02		864	Det 2
024826-1		1245			03		847	Det 2
024827-1		1300			04		746	Det 2
024828-1		1305			05		851	Det 1
024829-1		1308			06		797	Det 1
024830-1		1310			07		879	Det 1
024831-1		1313			08		672	
024832-1		1315			09		741	
024833-1		1318			10		777	
024834-1		1320			11		795	
024835-1		1340			12		761	
024836-1		1342			13		780	
024837-1	↓	1345	↓	↓	14		859	

Relinquished by _____ Date 6-29-95 Time 1053 Received by _____ Date 6/29/95 Time 1053
Relinquished by _____ Date 7/5/95 Time 855 Received by _____ Date 7/5/95 Time 0855
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer : mike young
Organization: 7585
Project Location: ER Site 58
Phone: 848-0389
Date Results Needed:
Suspect Isotopes:
Other Information: 03860

Hazards/Special Instructions:

Batch Log Number: 500501
Logged By:

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
024838-1	Soil	6/28/95 1348	500 ml	Gamma Spec	15		724	
024839-1	↓	1350	↓	↓	16		748	
024840-1	↓	1353	↓	↓	17		734	

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer: ~~7585~~ M. Young
Organization: 7585
Project Location: Scoping Samples
Phone: 845-0867
Date Results Needed: 6-30-95
Suspect Isotopes:
Other Information: 03869

Hazards/Special Instructions:

Batch Log Number: 508497
Logged By: JM

Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
024807-1A	Soil	6/27/95 1200	500		01	<300	584 g	
024808-1A		1205			02		699 g	
024809-1A		1209			03		748 g	
024810-1A		1212			04		755 g	
024811-1A		1220			05		717 g	
024812-1A		1235			06		790 g	
024813-1A		1238			07		735 g	
024814-1A		1241			08		824 g	
024815-1A		1245			09		806 g	
024816-1A		1248			10		870 g	
024817-1A		1250			11		839 g	
024818-1A		1255			12		670 g	
024819-1A		1257			13		924	
024820-1A		1259			14	<300	914 g	

Relinquished by [signature] Date 6-28-95 Time 1325 Received by [signature] Date 6/28/95 Time 1325
Relinquished by [signature] Date 7/5/95 Time 900 Received by [signature] Date 7/5/95 Time 0900
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Shaded areas are for RPSD use

To be completed by Customer

Customer: M. Young
Organization: 7585
Project Location: Scoping Samples
Phone: 845-10867
Date Results Needed: 6-30-95
Suspect Isotopes:
Other Information: 03869

Hazards/Special Instructions:

Batch Log Number: 500 497
Logged By: JMR
Analysis Type:
LIMS Login:
Results Faxed
Sample Disposal

☐ Gamma Spec
☐ H-3
☐ Alpha/Beta
☐ Alpha Spec
☐ Total U
☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
024821-1A	Solid	6-21-95/1303		γ Spec	15	<700	913g	
024822-1A	↓	↓ 1310		↓	16	<300	845g	
024823-1A		↓ 1305		↓	17	<300	752g	
LCS		(none)		γ Spec	18	NA	NA	

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer: ~~7585~~ M. Young
Organization: 7585
Project Location: Scoping Samples
Phone: 845-0867
Date Results Needed: 6-30-95
Suspect Isotopes:
Other Information: 03869

Hazards/Special Instructions:

Batch Log Number: 500497
Logged By: ~~JM~~

Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
024807-1A	Soil	6/27/95 1200	500		01	<300	884 g	
024808-1A		1205			02		699 g	
024809-1A		1209			03		748 g	
024810-1A		1212			04		755 g	
024811-1A		1220			05		717 g	
024812-1A		1235			06		750 g	
024813-1A		1238			07		735 g	
024814-1A		1241			08		824 g	
024815-1A		1245			09		806 g	
024816-1A		1248			10		870 g	
024817-1A		1250			11		839 g	
024818-1A		1255			12		670 g	
024819-1A		1257			13		924	
024820-1A		1259			14	<300	914 g	

Relinquished by	Date 6-28-95	Time 1325	Received by	Date 6/28/95	Time 1325
Relinquished by	Date 7/5/95	Time 900	Received by	Date 7/5/95	Time 0900
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 3

To be completed by Customer

Shaded areas are for RPSD use only

Customer : M. Young
Organization: 7585
Project Location: Scoping Samples
Phone: 845-0867
Date Results Needed: 6-30-95
Suspect Isotopes:
Other Information: 03869

Hazards/Special Instructions:

Batch Log Number: 500 497
Logged By: JM

Analysis Type:
- ☐ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
024821-1A	Solid	6-21-95 1303		γ Spec	15	2700	913.5	
024822-1A	↓	↓ 1310		↓	16	2300	845.8	
024823-1A	↓	↓ 1305		↓	17	2300	752.8	
LCS		1 hour		γ Spec	18	NA	NA	

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-29-95 9:23:20 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024807-1A
Lab Sample ID : 50049701

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 884.000 gram
Sample Date/Time : 6-27-95 12:00:00 PM
Acquire Start Date : 6-29-95 8:49:21 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.35
TH-234	Not Detected	--------	1.29
U-234	Not Detected	--------	2.04E+01
RA-226	1.31	8.86E-01	1.36
PB-214	6.87E-01	1.31E-01	1.04E-01
BI-214	5.58E-01	1.15E-01	1.00E-01
PB-210	Not Detected	--------	3.47E+02
TH-232	8.82E-01	2.93E-01	3.65E-01
RA-228	7.14E-01	2.51E-01	3.05E-01
AC-228	8.67E-01	2.07E-01	1.87E-01
TH-228	8.48E-01	3.93E-01	7.77E-01
RA-224	1.76	4.54E-01	7.05E-01
PB-212	8.91E-01	1.71E-01	6.56E-02
BI-212	8.10E-01	4.42E-01	6.29E-01
TL-208	6.72E-01	1.49E-01	1.31E-01
U-235	Not Detected	--------	4.01E-01
TH-231	Not Detected	--------	1.00
PA-231	Not Detected	--------	2.20
AC-227	Not Detected	--------	3.03
TH-227	Not Detected	--------	6.35E-01
RA-223	Not Detected	--------	3.53E-01
RN-219	Not Detected	--------	4.80E-01
PB-211	Not Detected	--------	1.18
TL-207	Not Detected	--------	2.25E+01
AM-241	Not Detected	--------	8.61E-01
PU-239	Not Detected	--------	4.80E+02
NP-237	Not Detected	--------	6.35E-01
PA-233	Not Detected	--------	9.56E-02
TH-229	Not Detected	--------	5.04E-01

[Summary Report] - Sample ID: 50049701

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.06E-02
AR-41	Not Detected	--------	1.82E+06
BA-133	Not Detected	--------	1.01E-01
BA-140	Not Detected	--------	1.75E-01
CD-109	Not Detected	--------	1.18
CD-115	Not Detected	--------	2.00E-01
CE-139	Not Detected	--------	5.32E-02
CE-141	Not Detected	--------	9.41E-02
CE-144	Not Detected	--------	4.21E-01
CO-56	Not Detected	--------	5.58E-02
CO-57	Not Detected	--------	5.52E-02
CO-58	Not Detected	--------	4.91E-02
CO-60	Not Detected	--------	5.61E-02
CR-51	Not Detected	--------	4.03E-01
CS-134	Not Detected	--------	8.00E-02
CS-137	2.19E-01	5.20E-02	5.16E-02
CU-64	Not Detected	--------	1.40E+02
EU-152	Not Detected	--------	3.93E-01
EU-154	Not Detected	--------	2.98E-01
EU-155	Not Detected	--------	2.52E-01
FE-59	Not Detected	--------	1.25E-01
GD-153	Not Detected	--------	2.02E-01
HG-203	Not Detected	--------	5.30E-02
I-131	Not Detected	--------	5.47E-02
IN-115m	Not Detected	--------	1.19E+02
IR-192	Not Detected	--------	4.51E-02
K-40	1.65E+01	2.42	5.46E-01
LA-140	Not Detected	--------	1.39E-01
MN-54	Not Detected	--------	5.50E-02
MN-56	Not Detected	--------	1.01E+04
MO-99	Not Detected	--------	6.20E-01
NA-22	Not Detected	--------	7.01E-02
NA-24	Not Detected	--------	4.36E-01
NB-95	Not Detected	--------	4.21E-01
ND-147	Not Detected	--------	3.41E-01
NI-57	Not Detected	--------	1.84E-01
BE-7	Not Detected	--------	4.23E-01
RU-103	Not Detected	--------	4.70E-02
RU-106	Not Detected	--------	5.00E-01
SB-122	Not Detected	--------	1.10E-01
SB-124	Not Detected	--------	4.96E-02
SB-125	Not Detected	--------	1.43E-01
SC-46	Not Detected	--------	8.38E-02
SR-85	Not Detected	--------	6.42E-02
TA-182	Not Detected	--------	2.49E-01
TA-183	Not Detected	--------	9.74E-01
TE-132	Not Detected	--------	7.07E-02
TL-201	Not Detected	--------	4.02E-01
XE-133	Not Detected	--------	4.08E-01
Y-88	Not Detected	--------	4.07E-02
ZN-65	Not Detected	--------	1.65E-01
ZR-95	Not Detected	--------	9.54E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-29-95 10:03:52 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024808-1A
Lab Sample ID : 50049702

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 699.000 gram
Sample Date/Time : 6-27-95 12:05:00 PM
Acquire Start Date : 6-29-95 9:28:41 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.98
TH-234	1.33	7.15E-01	9.13E-01
U-234	Not Detected	--------	2.38E+01
RA-226	1.34	8.66E-01	1.31
PB-214	8.06E-01	1.59E-01	1.34E-01
BI-214	6.71E-01	1.39E-01	1.22E-01
PB-210	Not Detected	--------	3.80E+02
TH-232	8.56E-01	2.80E-01	3.32E-01
RA-228	1.11	3.42E-01	2.07E-01
AC-228	1.00	2.35E-01	1.94E-01
TH-228	1.09	4.70E-01	9.05E-01
RA-224	2.03	5.34E-01	8.08E-01
PB-212	9.87E-01	1.91E-01	7.70E-02
BI-212	6.51E-01	5.36E-01	8.24E-01
TL-208	8.75E-01	1.93E-01	1.72E-01
U-235	Not Detected	--------	4.74E-01
TH-231	Not Detected	--------	1.19
PA-231	Not Detected	--------	2.56
AC-227	Not Detected	--------	3.38
TH-227	Not Detected	--------	7.45E-01
RA-223	Not Detected	--------	4.14E-01
RN-219	Not Detected	--------	5.78E-01
PB-211	Not Detected	--------	1.28
TL-207	Not Detected	--------	2.50E+01
AM-241	Not Detected	--------	1.02
PU-239	Not Detected	--------	5.32E+02
NP-237	Not Detected	--------	4.88E-01
PA-233	Not Detected	--------	1.17E-01
TH-229	Not Detected	--------	5.68E-01

[Summary Report] - Sample ID: 50049702

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.37E-02
AR-41	Not Detected	--------	2.75E+06
BA-133	Not Detected	--------	1.21E-01
BA-140	Not Detected	--------	2.30E-01
CD-109	Not Detected	--------	1.68
CD-115	Not Detected	--------	2.28E-01
CE-139	Not Detected	--------	6.05E-02
CE-141	Not Detected	--------	1.08E-01
CE-144	Not Detected	--------	4.54E-01
CO-56	Not Detected	--------	6.93E-02
CO-57	Not Detected	--------	6.09E-02
CO-58	Not Detected	--------	5.63E-02
CO-60	Not Detected	--------	6.94E-02
CR-51	Not Detected	--------	4.50E-01
CS-134	Not Detected	--------	9.90E-02
CS-137	1.65E-01	4.62E-02	4.79E-02
CU-64	Not Detected	--------	1.60E+02
EU-152	Not Detected	--------	5.12E-01
EU-154	Not Detected	--------	3.69E-01
EU-155	Not Detected	--------	2.86E-01
FE-59	Not Detected	--------	1.32E-01
GD-153	Not Detected	--------	2.24E-01
HG-203	Not Detected	--------	6.17E-02
I-131	Not Detected	--------	6.38E-02
IN-115m	Not Detected	--------	1.47E+02
IR-192	Not Detected	--------	5.22E-02
K-40	1.91E+01	2.82	6.23E-01
LA-140	Not Detected	--------	1.39E-01
MN-54	Not Detected	--------	6.52E-02
MN-56	Not Detected	--------	1.46E+04
MO-99	Not Detected	--------	7.73E-01
NA-22	Not Detected	--------	8.30E-02
NA-24	Not Detected	--------	4.85E-01
NB-95	Not Detected	--------	4.93E-01
ND-147	Not Detected	--------	4.44E-01
NI-57	Not Detected	--------	2.10E-01
BE-7	Not Detected	--------	4.73E-01
RU-103	Not Detected	--------	5.43E-02
RU-106	Not Detected	--------	6.09E-01
SB-122	Not Detected	--------	1.21E-01
SB-124	Not Detected	--------	6.20E-02
SB-125	Not Detected	--------	1.59E-01
SC-46	Not Detected	--------	1.02E-01
SR-85	Not Detected	--------	7.50E-02
TA-182	Not Detected	--------	3.06E-01
TA-183	Not Detected	--------	1.15
TE-132	Not Detected	--------	8.16E-02
TL-201	Not Detected	--------	4.75E-01
XE-133	Not Detected	--------	4.84E-01
Y-88	Not Detected	--------	5.53E-02
ZN-65	Not Detected	--------	2.01E-01
ZR-95	Not Detected	--------	1.09E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-29-95 10:43:16 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024809-1A
Lab Sample ID : 50049703

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 748.000 gram
Sample Date/Time : 6-27-95 12:09:00 PM
Acquire Start Date : 6-29-95 10:09:20 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.14
TH-234	Not Detected	--------	1.52
U-234	Not Detected	--------	2.33E+01
RA-226	1.32	8.33E-01	1.26
PB-214	6.73E-01	1.36E-01	1.17E-01
BI-214	7.13E-01	1.38E-01	1.05E-01
PB-210	Not Detected	--------	3.79E+02
TH-232	7.94E-01	2.74E-01	3.39E-01
RA-228	8.81E-01	3.07E-01	2.37E-01
AC-228	Not Detected	--------	3.95E-01
TH-228	8.69E-01	4.25E-01	8.88E-01
RA-224	2.00	5.20E-01	7.88E-01
PB-212	9.53E-01	1.83E-01	7.17E-02
BI-212	1.33	5.70E-01	7.57E-01
TL-208	7.45E-01	1.71E-01	1.57E-01
U-235	Not Detected	--------	4.34E-01
TH-231	Not Detected	--------	1.12
PA-231	Not Detected	--------	2.43
AC-227	Not Detected	--------	3.14
TH-227	Not Detected	--------	7.17E-01
RA-223	Not Detected	--------	4.01E-01
RN-219	Not Detected	--------	5.32E-01
PB-211	Not Detected	--------	1.35
TL-207	Not Detected	--------	2.40E+01
AM-241	Not Detected	--------	9.86E-01
PU-239	Not Detected	--------	5.35E+02
NP-237	Not Detected	--------	7.14E-01
PA-233	Not Detected	--------	1.15E-01
TH-229	Not Detected	--------	5.70E-01

[Summary Report] - Sample ID: 50049703

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.10E-01
AR-41	Not Detected	--------	3.06E+06
BA-133	Not Detected	--------	1.16E-01
BA-140	Not Detected	--------	2.31E-01
CD-109	Not Detected	--------	1.55
CD-115	Not Detected	--------	2.27E-01
CE-139	Not Detected	--------	6.12E-02
CE-141	Not Detected	--------	1.00E-01
CE-144	Not Detected	--------	4.61E-01
CO-56	Not Detected	--------	6.82E-02
CO-57	Not Detected	--------	6.22E-02
CO-58	Not Detected	--------	5.63E-02
CO-60	Not Detected	--------	7.07E-02
CR-51	Not Detected	--------	4.55E-01
CS-134	Not Detected	--------	9.37E-02
CS-137	3.91E-01	7.77E-02	6.39E-02
CU-64	Not Detected	--------	1.53E+02
EU-152	Not Detected	--------	4.32E-01
EU-154	Not Detected	--------	3.60E-01
EU-155	Not Detected	--------	2.85E-01
FE-59	Not Detected	--------	1.38E-01
GD-153	Not Detected	--------	2.27E-01
HG-203	Not Detected	--------	5.96E-02
I-131	Not Detected	--------	6.25E-02
IN-115m	Not Detected	--------	1.60E+02
IR-192	Not Detected	--------	5.41E-02
K-40	1.82E+01	2.68	5.81E-01
LA-140	Not Detected	--------	1.43E-01
MN-54	Not Detected	--------	5.65E-02
MN-56	Not Detected	--------	1.70E+04
MO-99	Not Detected	--------	7.27E-01
NA-22	Not Detected	--------	8.21E-02
NA-24	Not Detected	--------	5.72E-01
NB-95	Not Detected	--------	4.80E-01
ND-147	Not Detected	--------	4.25E-01
NI-57	Not Detected	--------	2.06E-01
BE-7	Not Detected	--------	4.98E-01
RU-103	Not Detected	--------	5.51E-02
RU-106	Not Detected	--------	5.66E-01
SB-122	Not Detected	--------	1.20E-01
SB-124	Not Detected	--------	6.10E-02
SB-125	Not Detected	--------	1.68E-01
SC-46	Not Detected	--------	9.63E-02
SR-85	Not Detected	--------	7.17E-02
TA-182	Not Detected	--------	2.84E-01
TA-183	Not Detected	--------	1.12
TE-132	Not Detected	--------	8.04E-02
TL-201	Not Detected	--------	4.53E-01
XE-133	Not Detected	--------	4.69E-01
Y-88	Not Detected	--------	5.60E-02
ZN-65	Not Detected	--------	1.88E-01
ZR-95	Not Detected	--------	1.07E-01

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 6-29-95 11:23:05 AM *
****
*
* Analyzed by: 7/3/95 Reviewed by: 7/3/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024810-1A
Lab Sample ID : 50049704

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 755.000 gram
Sample Date/Time : 6-27-95 12:12:00 PM
Acquire Start Date : 6-29-95 10:49:16 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.93
TH-234	Not Detected	--------	1.45
U-234	Not Detected	--------	2.25E+01
RA-226	2.51	1.09	1.55
PB-214	7.48E-01	1.52E-01	1.36E-01
BI-214	6.44E-01	1.29E-01	1.06E-01
PB-210 --	Not Detected	--------	3.82E+02
TH-232	7.31E-01	3.58E-01	5.16E-01
RA-228	7.27E-01	2.81E-01	2.36E-01
AC-228	Not Detected	--------	3.82E-01
TH-228	1.07	5.40E-01	9.20E-01
RA-224	1.90	5.41E-01	7.94E-01
PB-212	8.45E-01	1.73E-01	7.48E-02
BI-212	1.20	4.89E-01	6.20E-01
TL-208	8.07E-01	1.74E-01	1.44E-01
U-235	Not Detected	--------	4.45E-01
TH-231	Not Detected	--------	1.12
PA-231	Not Detected	--------	2.42
AC-227	Not Detected	--------	3.28
TH-227	Not Detected	--------	6.87E-01
RA-223	Not Detected	--------	4.00E-01
RN-219	Not Detected	--------	5.22E-01
PB-211	Not Detected	--------	1.30
TL-207	Not Detected	--------	2.41E+01
AM-241	Not Detected	--------	9.60E-01
PU-239	Not Detected	--------	5.14E+02
NP-237	Not Detected	--------	7.18E-01
PA-233	Not Detected	--------	1.10E-01
TH-229	Not Detected	--------	5.48E-01

[Summary Report] - Sample ID: 50049704

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.00E-01
AR-41	Not Detected	--------	3.79E+06
BA-133	Not Detected	--------	1.16E-01
BA-140	Not Detected	--------	2.30E-01
CD-109	Not Detected	--------	2.39
CD-115	Not Detected	--------	2.23E-01
CE-139	Not Detected	--------	5.98E-02
CE-141	Not Detected	--------	1.05E-01
CE-144	Not Detected	--------	4.46E-01
CO-56	Not Detected	--------	6.11E-02
CO-57	Not Detected	--------	5.73E-02
CO-58	Not Detected	--------	5.58E-02
CO-60	Not Detected	--------	6.61E-02
CR-51	Not Detected	--------	4.41E-01
CS-134	Not Detected	--------	8.97E-02
CS-137	3.17E-01	6.62E-02	5.56E-02
CU-64	Not Detected	--------	1.56E+02
EU-152	Not Detected	--------	4.33E-01
EU-154	Not Detected	--------	3.34E-01
EU-155	Not Detected	--------	2.59E-01
FE-59	Not Detected	--------	1.32E-01
GD-153	Not Detected	--------	2.22E-01
HG-203	Not Detected	--------	5.42E-02
I-131	Not Detected	--------	6.01E-02
IN-115m	Not Detected	--------	1.71E+02
IR-192	Not Detected	--------	5.31E-02
K-40	1.68E+01	2.49	3.88E-01
LA-140	Not Detected	--------	1.65E-01
MN-54	Not Detected	--------	5.94E-02
MN-56	Not Detected	--------	1.79E+04
MO-99	Not Detected	--------	7.48E-01
NA-22	Not Detected	--------	7.97E-02
NA-24	Not Detected	--------	5.50E-01
NB-95	Not Detected	--------	4.61E-01
ND-147	Not Detected	--------	4.27E-01
NI-57	Not Detected	--------	2.08E-01
BE-7	Not Detected	--------	5.07E-01
RU-103	Not Detected	--------	5.24E-02
RU-106	Not Detected	--------	5.14E-01
SB-122	Not Detected	--------	1.28E-01
SB-124	Not Detected	--------	5.66E-02
SB-125	Not Detected	--------	1.65E-01
SC-46	Not Detected	--------	9.64E-02
SR-85	Not Detected	--------	7.20E-02
TA-182	Not Detected	--------	2.80E-01
TA-183	Not Detected	--------	1.07
TE-132	Not Detected	--------	7.87E-02
TL-201	Not Detected	--------	4.60E-01
XE-133	Not Detected	--------	4.73E-01
Y-88	Not Detected	--------	5.23E-02
ZN-65	Not Detected	--------	1.91E-01
ZR-95	Not Detected	--------	1.03E-01

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 6-29-95 12:03:16 PM *
****
*
* Analyzed by: 7/3/95 Reviewed by: 7/3/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024811-1A
Lab Sample ID : 50049705

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 717.000 gram
Sample Date/Time : 6-27-95 12:20:00 PM
Acquire Start Date : 6-29-95 11:29:19 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.15
TH-234	Not Detected	--------	1.53
U-234	Not Detected	--------	2.32E+01
RA-226	1.12	6.48E-01	9.56E-01
PB-214	7.60E-01	1.46E-01	1.12E-01
BI-214	6.77E-01	1.42E-01	1.30E-01
PB-210	Not Detected	--------	3.83E+02
TH-232	7.56E-01	2.97E-01	3.93E-01
RA-228	8.79E-01	2.77E-01	3.01E-01
AC-228	Not Detected	--------	3.80E-01
TH-228	9.26E-01	4.40E-01	9.06E-01
RA-224	2.01	3.34E-01	8.19E-01
PB-212	9.12E-01	1.48E-01	8.20E-02
BI-212	1.01	4.54E-01	5.88E-01
TL-208	8.05E-01	1.81E-01	1.62E-01
U-235	Not Detected	--------	4.45E-01
TH-231	Not Detected	--------	1.14
PA-231	Not Detected	--------	2.46
AC-227	Not Detected	--------	3.22
TH-227	Not Detected	--------	7.18E-01
RA-223	Not Detected	--------	4.03E-01
RN-219	Not Detected	--------	5.80E-01
PB-211	Not Detected	--------	1.36
TL-207	Not Detected	--------	2.51E+01
AM-241	Not Detected	--------	1.01
PU-239	Not Detected	--------	5.29E+02
NP-237	Not Detected	--------	7.27E-01
PA-233	Not Detected	--------	1.10E-01
TH-229	Not Detected	--------	5.48E-01

[Summary Report] - Sample ID: 50049705

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	9.67E-02
AR-41	Not Detected	--------	5.07E+06
BA-133	Not Detected	--------	1.21E-01
BA-140	Not Detected	--------	2.28E-01
CD-109	Not Detected	--------	1.42
CD-115	Not Detected	--------	2.38E-01
CE-139	Not Detected	--------	5.99E-02
CE-141	Not Detected	--------	1.05E-01
CE-144	Not Detected	--------	4.66E-01
CO-56	Not Detected	--------	6.51E-02
CO-57	Not Detected	--------	5.98E-02
CO-58	Not Detected	--------	6.11E-02
CO-60	Not Detected	--------	7.51E-02
CR-51	Not Detected	--------	4.71E-01
CS-134	Not Detected	--------	9.35E-02
CS-137	2.56E-01	5.96E-02	5.58E-02
CU-64	Not Detected	--------	1.83E+02
EU-152	Not Detected	--------	4.61E-01
EU-154	Not Detected	--------	3.58E-01
EU-155	Not Detected	--------	2.80E-01
FE-59	Not Detected	--------	1.31E-01
GD-153	Not Detected	--------	2.23E-01
HG-203	Not Detected	--------	5.76E-02
I-131	Not Detected	--------	6.60E-02
IN-115m	Not Detected	--------	1.98E+02
IR-192	Not Detected	--------	5.56E-02
K-40	1.84E+01	2.72	4.98E-01
LA-140	Not Detected	--------	1.59E-01
MN-54	Not Detected	--------	6.64E-02
MN-56	Not Detected	--------	2.21E+04
MO-99	Not Detected	--------	7.89E-01
NA-22	Not Detected	--------	7.86E-02
NA-24	Not Detected	--------	6.12E-01
NB-95	Not Detected	--------	4.86E-01
ND-147	Not Detected	--------	4.04E-01
NI-57	Not Detected	--------	2.40E-01
BE-7	Not Detected	--------	4.98E-01
RU-103	Not Detected	--------	5.85E-02
RU-106	Not Detected	--------	5.36E-01
SB-122	Not Detected	--------	1.20E-01
SB-124	Not Detected	--------	5.81E-02
SB-125	Not Detected	--------	1.72E-01
SC-46	Not Detected	--------	9.32E-02
SR-85	Not Detected	--------	7.38E-02
TA-182	Not Detected	--------	2.75E-01
TA-183	Not Detected	--------	1.13
TE-132	Not Detected	--------	8.73E-02
TL-201	Not Detected	--------	4.42E-01
XE-133	Not Detected	--------	4.90E-01
Y-88	Not Detected	--------	4.89E-02
ZN-65	Not Detected	--------	1.86E-01
ZR-95	Not Detected	--------	1.16E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-29-95 12:43:27 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024812-1A
Lab Sample ID : 50049706

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 790.000 gram
Sample Date/Time : 6-27-95 12:35:00 PM
Acquire Start Date : 6-29-95 12:09:26 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.04
TH-234	Not Detected	--------	1.40
U-234	Not Detected	--------	2.23E+01
RA-226	1.41	1.09	1.70
PB-214	7.28E-01	1.40E-01	1.09E-01
BI-214	7.04E-01	1.34E-01	9.93E-02
PB-210	Not Detected	--------	3.88E+02
TH-232	7.42E-01	2.59E-01	3.22E-01
RA-228	6.55E-01	2.30E-01	2.66E-01
AC-228	1.12	2.41E-01	1.75E-01
TH-228	1.13	4.79E-01	8.27E-01
RA-224	Not Detected	--------	8.20E-01
PB-212	8.57E-01	1.67E-01	7.23E-02
BI-212	1.04	4.45E-01	5.72E-01
TL-208	7.85E-01	1.65E-01	1.29E-01
U-235	Not Detected	--------	4.26E-01
TH-231	Not Detected	--------	1.13
PA-231	Not Detected	--------	2.36
AC-227	Not Detected	--------	3.14
TH-227	Not Detected	--------	6.60E-01
RA-223	Not Detected	--------	4.06E-01
RN-219	Not Detected	--------	4.85E-01
PB-211	Not Detected	--------	1.30
TL-207	Not Detected	--------	2.26E+01
AM-241	Not Detected	--------	9.22E-01
PU-239	Not Detected	--------	5.17E+02
NP-237	Not Detected	--------	7.15E-01
PA-233	Not Detected	--------	1.13E-01
TH-229	Not Detected	--------	5.43E-01

[Summary Report] - Sample ID: 50049706

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.07E-01
AR-41	Not Detected	--------	5.11E+06
BA-133	Not Detected	--------	1.14E-01
BA-140	Not Detected	--------	2.20E-01
CD-109	Not Detected	--------	1.39
CD-115	Not Detected	--------	2.20E-01
CE-139	Not Detected	--------	5.53E-02
CE-141	Not Detected	--------	1.01E-01
CE-144	Not Detected	--------	4.22E-01
CO-56	Not Detected	--------	6.14E-02
CO-57	Not Detected	--------	5.85E-02
CO-58	Not Detected	--------	5.78E-02
CO-60	Not Detected	--------	6.28E-02
CR-51	Not Detected	--------	4.36E-01
CS-134	Not Detected	--------	9.13E-02
CS-137	4.54E-01	8.07E-02	5.03E-02
CU-64	Not Detected	--------	1.63E+02
EU-152	Not Detected	--------	4.62E-01
EU-154	Not Detected	--------	3.34E-01
EU-155	Not Detected	--------	2.68E-01
FE-59	Not Detected	--------	1.31E-01
GD-153	Not Detected	--------	2.21E-01
HG-203	Not Detected	--------	5.82E-02
I-131	Not Detected	--------	6.28E-02
IN-115m	Not Detected	--------	1.94E+02
IR-192	Not Detected	--------	5.35E-02
K-40	1.65E+01	2.45	5.89E-01
LA-140	Not Detected	--------	1.57E-01
MN-54	Not Detected	--------	6.36E-02
MN-56	Not Detected	--------	2.33E+04
MO-99	Not Detected	--------	6.86E-01
NA-22	Not Detected	--------	7.61E-02
NA-24	Not Detected	--------	5.70E-01
NB-95	Not Detected	--------	4.46E-01
ND-147	Not Detected	--------	3.86E-01
NI-57	Not Detected	--------	2.28E-01
BE-7	Not Detected	--------	4.63E-01
RU-103	Not Detected	--------	5.30E-02
RU-106	Not Detected	--------	5.36E-01
SB-122	Not Detected	--------	1.19E-01
SB-124	Not Detected	--------	5.54E-02
SB-125	Not Detected	--------	1.72E-01
SC-46	Not Detected	--------	9.46E-02
SR-85	Not Detected	--------	6.89E-02
TA-182	Not Detected	--------	2.77E-01
TA-183	Not Detected	--------	1.05
TE-132	Not Detected	--------	7.90E-02
TL-201	Not Detected	--------	4.57E-01
XE-133	Not Detected	--------	4.78E-01
Y-88	Not Detected	--------	5.21E-02
ZN-65	Not Detected	--------	1.81E-01
ZR-95	Not Detected	--------	9.82E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

6-29-95 1:23:33 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024813-1A
Lab Sample ID : 50049707

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 735.000 gram
Sample Date/Time : 6-27-95 12:38:00 PM
Acquire Start Date : 6-29-95 12:49:48 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.33
TH-234	Not Detected	--------	1.45
U-234	Not Detected	--------	2.20E+01
RA-226	1.82	8.77E-01	1.27
PB-214	7.37E-01	1.44E-01	1.15E-01
BI-214	6.06E-01	1.23E-01	9.77E-02
PB-210	Not Detected	--------	3.78E+02
TH-232	7.86E-01	2.76E-01	3.43E-01
RA-228	7.41E-01	3.10E-01	4.12E-01
AC-228	Not Detected	--------	3.74E-01
TH-228	1.16	4.71E-01	8.00E-01
RA-224	Not Detected	--------	2.16
PB-212	7.83E-01	1.58E-01	1.34E-01
BI-212	8.56E-01	4.60E-01	6.43E-01
TL-208	7.29E-01	1.68E-01	1.55E-01
U-235	Not Detected	--------	4.54E-01
TH-231	Not Detected	--------	1.20
PA-231	Not Detected	--------	2.43
AC-227	Not Detected	--------	3.23
TH-227	Not Detected	--------	7.21E-01
RA-223	Not Detected	--------	4.33E-01
RN-219	Not Detected	--------	5.42E-01
PB-211	Not Detected	--------	1.37
TL-207	Not Detected	--------	2.56E+01
AM-241	Not Detected	--------	9.92E-01
PU-239	Not Detected	--------	5.17E+02
NP-237	Not Detected	--------	7.41E-01
PA-233	Not Detected	--------	1.12E-01
TH-229	Not Detected	--------	5.63E-01

[Summary Report] - Sample ID: 50049707

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.01E-01
AR-41	Not Detected	--------	7.46E+06
BA-133	Not Detected	--------	1.17E-01
BA-140	Not Detected	--------	2.26E-01
CD-109	Not Detected	--------	2.50
CD-115	Not Detected	--------	2.33E-01
CE-139	Not Detected	--------	6.18E-02
CE-141	Not Detected	--------	1.05E-01
CE-144	Not Detected	--------	4.58E-01
CO-56	Not Detected	--------	6.23E-02
CO-57	Not Detected	--------	6.19E-02
CO-58	Not Detected	--------	6.02E-02
CO-60	Not Detected	--------	7.11E-02
CR-51	Not Detected	--------	4.45E-01
CS-134	Not Detected	--------	9.21E-02
CS-137	3.16E-01	6.93E-02	6.42E-02
CU-64	Not Detected	--------	1.98E+02
EU-152	Not Detected	--------	4.40E-01
EU-154	Not Detected	--------	3.43E-01
EU-155	Not Detected	--------	2.80E-01
FE-59	Not Detected	--------	1.26E-01
GD-153	Not Detected	--------	2.29E-01
HG-203	Not Detected	--------	5.81E-02
I-131	Not Detected	--------	6.11E-02
IN-115m	Not Detected	--------	2.24E+02
IR-192	Not Detected	--------	5.24E-02
K-40	1.78E+01	2.64	6.09E-01
LA-140	Not Detected	--------	1.70E-01
MN-54	Not Detected	--------	6.13E-02
MN-56	Not Detected	--------	2.79E+04
MO-99	Not Detected	--------	6.88E-01
NA-22	Not Detected	--------	8.57E-02
NA-24	Not Detected	--------	5.47E-01
NB-95	Not Detected	--------	4.88E-01
ND-147	Not Detected	--------	4.22E-01
NI-57	Not Detected	--------	2.09E-01
BE-7	Not Detected	--------	4.84E-01
RU-103	Not Detected	--------	5.43E-02
RU-106	Not Detected	--------	5.05E-01
SB-122	Not Detected	--------	1.27E-01
SB-124	Not Detected	--------	6.00E-02
SB-125	Not Detected	--------	1.57E-01
SC-46	Not Detected	--------	9.73E-02
SR-85	Not Detected	--------	7.55E-02
TA-182	Not Detected	--------	2.88E-01
TA-183	Not Detected	--------	1.12
TE-132	Not Detected	--------	8.15E-02
TL-201	Not Detected	--------	4.46E-01
XE-133	Not Detected	--------	5.14E-01
Y-88	Not Detected	--------	4.50E-02
ZN-65	Not Detected	--------	1.90E-01
ZR-95	Not Detected	--------	1.16E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-29-95 2:02:41 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024814-1A
Lab Sample ID : 50049708

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 824.000 gram
Sample Date/Time : 6-27-95 12:41:00 PM
Acquire Start Date : 6-29-95 1:30:12 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.70
TH-234	Not Detected	--------	1.33
U-234	Not Detected	--------	2.14E+01
RA-226	1.39	6.88E-01	9.93E-01
PB-214	7.21E-01	1.38E-01	1.10E-01
BI-214	5.60E-01	1.13E-01	8.99E-02
PB-210	Not Detected	--------	3.57E+02
TH-232	6.61E-01	2.38E-01	3.00E-01
RA-228	1.02	5.62E-01	2.81E-01
AC-228	Not Detected	--------	3.59E-01
TH-228	8.75E-01	4.31E-01	8.79E-01
RA-224	1.82	5.16E-01	7.66E-01
PB-212	9.32E-01	2.18E-01	7.26E-02
BI-212	8.47E-01	4.21E-01	5.75E-01
TL-208	8.05E-01	1.73E-01	1.50E-01
U-235	Not Detected	--------	4.08E-01
TH-231	Not Detected	--------	1.06
PA-231	Not Detected	--------	2.22
AC-227	Not Detected	--------	3.01
TH-227	Not Detected	--------	6.61E-01
RA-223	Not Detected	--------	3.75E-01
RN-219	Not Detected	--------	5.03E-01
PB-211	Not Detected	--------	1.18
TL-207	Not Detected	--------	2.55E+01
AM-241	Not Detected	--------	8.84E-01
PU-239	Not Detected	--------	5.02E+02
NP-237	Not Detected	--------	6.66E-01
PA-233	Not Detected	--------	1.02E-01
TH-229	Not Detected	--------	5.14E-01

[Summary Report] - Sample ID: 50049708

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.73E-02
AR-41	Not Detected	--------	8.96E+06
BA-133	Not Detected	--------	1.08E-01
BA-140	Not Detected	--------	2.13E-01
CD-109	Not Detected	--------	2.24
CD-115	Not Detected	--------	2.09E-01
CE-139	Not Detected	--------	5.44E-02
CE-141	Not Detected	--------	9.37E-02
CE-144	Not Detected	--------	4.26E-01
CO-56	Not Detected	--------	5.63E-02
CO-57	Not Detected	--------	5.76E-02
CO-58	Not Detected	--------	5.32E-02
CO-60	Not Detected	--------	6.54E-02
CR-51	Not Detected	--------	4.30E-01
CS-134	Not Detected	--------	8.32E-02
CS-137	2.56E-01	5.39E-02	4.24E-02
CU-64	Not Detected	--------	1.99E+02
EU-152	Not Detected	--------	4.16E-01
EU-154	Not Detected	--------	3.14E-01
EU-155	Not Detected	--------	2.57E-01
FE-59	Not Detected	--------	1.29E-01
GD-153	Not Detected	--------	2.06E-01
HG-203	Not Detected	--------	5.43E-02
I-131	Not Detected	--------	5.78E-02
IN-115m	Not Detected	--------	2.20E+02
IR-192	Not Detected	--------	4.82E-02
K-40	1.79E+01	2.63	6.01E-01
LA-140	Not Detected	--------	1.47E-01
MN-54	Not Detected	--------	5.86E-02
MN-56	Not Detected	--------	2.98E+04
MO-99	Not Detected	--------	7.42E-01
NA-22	Not Detected	--------	7.24E-02
NA-24	Not Detected	--------	5.49E-01
NB-95	Not Detected	--------	4.50E-01
ND-147	Not Detected	--------	4.23E-01
NI-57	Not Detected	--------	2.02E-01
BE-7	Not Detected	--------	4.92E-01
RU-103	Not Detected	--------	5.19E-02
RU-106	Not Detected	--------	5.30E-01
SB-122	Not Detected	--------	1.07E-01
SB-124	Not Detected	--------	5.31E-02
SB-125	Not Detected	--------	1.48E-01
SC-46	Not Detected	--------	8.84E-02
SR-85	Not Detected	--------	6.66E-02
TA-182	Not Detected	--------	2.63E-01
TA-183	Not Detected	--------	1.01
TE-132	Not Detected	--------	7.66E-02
TL-201	Not Detected	--------	4.45E-01
XE-133	Not Detected	--------	4.36E-01
Y-88	Not Detected	--------	5.71E-02
ZN-65	Not Detected	--------	1.76E-01
ZR-95	Not Detected	--------	1.03E-01

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

6-29-95 2:39:47 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024815-1A
Lab Sample ID : 50049709

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 806.000 gram
Sample Date/Time : 6-27-95 12:45:00 PM
Acquire Start Date : 6-29-95 2:07:24 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.60
TH-234	Not Detected	--------	1.40
U-234	Not Detected	--------	1.99E+01
RA-226	1.64	7.36E-01	1.04
PB-214	6.46E-01	1.33E-01	1.19E-01
BI-214	5.72E-01	1.13E-01	8.47E-02
PB-210	Not Detected	--------	3.35E+02
TH-232	6.86E-01	2.50E-01	3.18E-01
RA-228	7.04E-01	2.53E-01	3.07E-01
AC-228	Not Detected	--------	3.49E-01
TH-228	Not Detected	--------	1.68
RA-224	Not Detected	--------	1.95
PB-212	7.03E-01	1.31E-01	8.35E-02
BI-212	8.78E-01	4.49E-01	6.22E-01
TL-208	7.23E-01	1.62E-01	1.46E-01
U-235	Not Detected	--------	4.14E-01
TH-231	Not Detected	--------	9.78E-01
PA-231	Not Detected	--------	2.33
AC-227	Not Detected	--------	3.05
TH-227	Not Detected	--------	6.50E-01
RA-223	Not Detected	--------	3.50E-01
RN-219	Not Detected	--------	4.93E-01
PB-211	Not Detected	--------	1.19
TL-207	Not Detected	--------	2.34E+01
AM-241	Not Detected	--------	9.15E-01
PU-239	Not Detected	--------	4.98E+02
NP-237	Not Detected	--------	6.37E-01
PA-233	Not Detected	--------	1.02E-01
TH-229	Not Detected	--------	5.37E-01

[Summary Report] - Sample ID: 50049709

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.69E-02
AR-41	Not Detected	--------	9.96E+06
BA-133	Not Detected	--------	1.06E-01
BA-140	Not Detected	--------	2.19E-01
CD-109	Not Detected	--------	1.60
CD-115	Not Detected	--------	2.18E-01
CE-139	Not Detected	--------	5.56E-02
CE-141	Not Detected	--------	1.00E-01
CE-144	Not Detected	--------	4.26E-01
CO-56	Not Detected	--------	6.06E-02
CO-57	Not Detected	--------	5.31E-02
CO-58	Not Detected	--------	5.06E-02
CO-60	Not Detected	--------	6.72E-02
CR-51	Not Detected	--------	4.21E-01
CS-134	Not Detected	--------	8.09E-02
CS-137	2.27E-01	5.39E-02	5.23E-02
CU-64	Not Detected	--------	1.83E+02
EU-152	Not Detected	--------	4.32E-01
EU-154	Not Detected	--------	3.08E-01
EU-155	Not Detected	--------	2.61E-01
FE-59	Not Detected	--------	1.18E-01
GD-153	Not Detected	--------	2.15E-01
HG-203	Not Detected	--------	5.42E-02
I-131	Not Detected	--------	5.93E-02
IN-115m	Not Detected	--------	2.47E+02
IR-192	Not Detected	--------	4.81E-02
K-40	1.57E+01	2.34	5.29E-01
LA-140	Not Detected	--------	1.38E-01
MN-54	Not Detected	--------	5.83E-02
MN-56	Not Detected	--------	3.72E+04
MO-99	Not Detected	--------	7.61E-01
NA-22	Not Detected	--------	7.43E-02
NA-24	Not Detected	--------	5.52E-01
NB-95	Not Detected	--------	4.47E-01
ND-147	Not Detected	--------	4.07E-01
NI-57	Not Detected	--------	2.20E-01
BE-7	Not Detected	--------	4.37E-01
RU-103	Not Detected	--------	4.87E-02
RU-106	Not Detected	--------	5.03E-01
SB-122	Not Detected	--------	1.21E-01
SB-124	Not Detected	--------	4.88E-02
SB-125	Not Detected	--------	1.51E-01
SC-46	Not Detected	--------	9.25E-02
SR-85	Not Detected	--------	6.66E-02
TA-182	Not Detected	--------	2.69E-01
TA-183	Not Detected	--------	1.06
TE-132	Not Detected	--------	7.66E-02
TL-201	Not Detected	--------	4.31E-01
XE-133	Not Detected	--------	4.46E-01
Y-88	Not Detected	--------	5.84E-02
ZN-65	Not Detected	--------	1.77E-01
ZR-95	Not Detected	--------	9.40E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-29-95 3:16:50 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024816-1A
Lab Sample ID : 50049710

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 870.000 gram
Sample Date/Time : 6-27-95 12:48:00 PM
Acquire Start Date : 6-29-95 2:44:13 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.43
TH-234	Not Detected	--------	1.29
U-234	Not Detected	--------	1.86E+01
RA-226	9.25E-01	5.98E-01	9.03E-01
PB-214	6.72E-01	1.37E-01	1.25E-01
BI-214	4.72E-01	1.16E-01	1.27E-01
PB-210	Not Detected	--------	3.38E+02
TH-232	8.72E-01	3.02E-01	3.84E-01
RA-228	6.66E-01	2.33E-01	2.78E-01
AC-228	9.17E-01	2.10E-01	1.76E-01
TH-228	6.34E-01	3.40E-01	7.86E-01
RA-224	1.73	4.51E-01	6.87E-01
PB-212	8.29E-01	1.59E-01	6.65E-02
BI-212	1.24	5.16E-01	6.82E-01
TL-208	8.19E-01	1.67E-01	1.30E-01
U-235	Not Detected	--------	4.03E-01
TH-231	Not Detected	--------	9.93E-01
PA-231	Not Detected	--------	2.14
AC-227	Not Detected	--------	2.86
TH-227	Not Detected	--------	6.22E-01
RA-223	Not Detected	--------	3.61E-01
RN-219	Not Detected	--------	4.92E-01
PB-211	Not Detected	--------	1.12
TL-207	Not Detected	--------	2.19E+01
AM-241	Not Detected	--------	8.88E-01
PU-239	Not Detected	--------	4.82E+02
NP-237	Not Detected	--------	6.35E-01
PA-233	Not Detected	--------	1.04E-01
TH-229	Not Detected	--------	4.83E-01

[Summary Report] - Sample ID: 50049710

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.45E-02
AR-41	Not Detected	--------	1.14E+07
BA-133	Not Detected	--------	1.04E-01
BA-140	Not Detected	--------	2.00E-01
CD-109	Not Detected	--------	1.32
CD-115	Not Detected	--------	2.13E-01
CE-139	Not Detected	--------	5.23E-02
CE-141	Not Detected	--------	9.50E-02
CE-144	Not Detected	--------	4.01E-01
CO-56	Not Detected	--------	5.50E-02
CO-57	Not Detected	--------	5.42E-02
CO-58	Not Detected	--------	5.25E-02
CO-60	Not Detected	--------	5.74E-02
CR-51	Not Detected	--------	4.00E-01
CS-134	Not Detected	--------	7.75E-02
CS-137	1.71E-01	4.54E-02	4.82E-02
CU-64	Not Detected	--------	1.92E+02
EU-152	Not Detected	--------	3.81E-01
EU-154	Not Detected	--------	3.19E-01
EU-155	Not Detected	--------	2.42E-01
FE-59	Not Detected	--------	1.12E-01
GD-153	Not Detected	--------	1.97E-01
HG-203	Not Detected	--------	5.26E-02
I-131	Not Detected	--------	5.47E-02
IN-115m	Not Detected	--------	2.62E+02
IR-192	Not Detected	--------	4.71E-02
K-40	1.60E+01	2.34	4.28E-01
LA-140	Not Detected	--------	1.18E-01
MN-54	Not Detected	--------	5.74E-02
MN-56	Not Detected	--------	3.93E+04
MO-99	Not Detected	--------	6.80E-01
NA-22	Not Detected	--------	6.95E-02
NA-24	Not Detected	--------	5.73E-01
NB-95	Not Detected	--------	4.29E-01
ND-147	Not Detected	--------	3.88E-01
NI-57	Not Detected	--------	2.15E-01
BE-7	Not Detected	--------	4.27E-01
RU-103	Not Detected	--------	5.01E-02
RU-106	Not Detected	--------	4.98E-01
SB-122	Not Detected	--------	1.12E-01
SB-124	Not Detected	--------	4.81E-02
SB-125	Not Detected	--------	1.50E-01
SC-46	Not Detected	--------	8.57E-02
SR-85	Not Detected	--------	6.34E-02
TA-182	Not Detected	--------	2.52E-01
TA-183	Not Detected	--------	1.01
TE-132	Not Detected	--------	7.50E-02
TL-201	Not Detected	--------	4.22E-01
XE-133	Not Detected	--------	4.61E-01
Y-88	Not Detected	--------	4.24E-02
ZN-65	Not Detected	--------	1.64E-01
ZR-95	Not Detected	--------	9.11E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-29-95 3:54:07 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024817-1A
Lab Sample ID : 50049711

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 839.000 gram
Sample Date/Time : 6-27-95 12:50:00 PM
Acquire Start Date : 6-29-95 3:21:35 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.62
TH-234	Not Detected	--------	1.29
U-234	Not Detected	--------	1.94E+01
RA-226	1.60	7.45E-01	1.07
PB-214	6.38E-01	1.24E-01	9.69E-02
BI-214	5.94E-01	1.17E-01	9.18E-02
PB-210	Not Detected	--------	3.57E+02
TH-232	7.45E-01	2.46E-01	2.97E-01
RA-228	6.85E-01	4.96E-01	2.23E-01
AC-228	Not Detected	--------	3.40E-01
TH-228	5.77E-01	3.55E-01	8.57E-01
RA-224	Not Detected	--------	7.17E-01
PB-212	8.49E-01	1.64E-01	6.93E-02
BI-212	5.73E-01	3.61E-01	5.20E-01
TL-208	8.24E-01	1.75E-01	1.49E-01
U-235	Not Detected	--------	4.06E-01
TH-231	Not Detected	--------	1.02
PA-231	Not Detected	--------	2.19
AC-227	Not Detected	--------	2.87
TH-227	Not Detected	--------	6.33E-01
RA-223	Not Detected	--------	3.65E-01
RN-219	~~3.27E-01~~	~~3.27E-01~~	5.17E-01 not detected 7/3/95
PB-211	Not Detected	--------	1.12
TL-207	Not Detected	--------	2.42E+01
AM-241	Not Detected	--------	8.97E-01
PU-239	Not Detected	--------	4.75E+02
NP-237	Not Detected	--------	6.39E-01
PA-233	Not Detected	--------	1.04E-01
TH-229	Not Detected	--------	5.29E-01

[Summary Report] - Sample ID: 50049711

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.88E-02
AR-41	Not Detected	--------	1.63E+07
BA-133	Not Detected	--------	1.01E-01
BA-140	Not Detected	--------	2.06E-01
CD-109	Not Detected	--------	2.22
CD-115	Not Detected	--------	2.19E-01
CE-139	Not Detected	--------	5.52E-02
CE-141	Not Detected	--------	9.56E-02
CE-144	Not Detected	--------	4.10E-01
CO-56	Not Detected	--------	5.53E-02
CO-57	Not Detected	--------	5.49E-02
CO-58	Not Detected	--------	5.10E-02
CO-60	Not Detected	--------	6.27E-02
CR-51	Not Detected	--------	3.87E-01
CS-134	Not Detected	--------	7.96E-02
CS-137	1.87E-01	4.98E-02	5.40E-02
CU-64	Not Detected	--------	2.07E+02
EU-152	Not Detected	--------	3.95E-01
EU-154	Not Detected	--------	3.06E-01
EU-155	Not Detected	--------	2.55E-01
FE-59	Not Detected	--------	1.16E-01
GD-153	Not Detected	--------	2.11E-01
HG-203	Not Detected	--------	5.27E-02
I-131	Not Detected	--------	5.79E-02
IN-115m	Not Detected	--------	2.93E+02
IR-192	Not Detected	--------	4.60E-02
K-40	1.47E+01	2.20	6.52E-01
LA-140	Not Detected	--------	1.48E-01
MN-54	Not Detected	--------	5.74E-02
MN-56	Not Detected	--------	4.63E+04
MO-99	Not Detected	--------	6.96E-01
NA-22	Not Detected	--------	7.26E-02
NA-24	Not Detected	--------	5.59E-01
NB-95	Not Detected	--------	4.36E-01
ND-147	Not Detected	--------	3.76E-01
NI-57	Not Detected	--------	1.96E-01
BE-7	Not Detected	--------	4.00E-01
RU-103	Not Detected	--------	5.04E-02
RU-106	Not Detected	--------	4.44E-01
SB-122	Not Detected	--------	1.16E-01
SB-124	Not Detected	--------	4.88E-02
SB-125	Not Detected	--------	1.44E-01
SC-46	Not Detected	--------	8.40E-02
SR-85	Not Detected	--------	6.31E-02
TA-182	Not Detected	--------	2.47E-01
TA-183	Not Detected	--------	1.03
TE-132	Not Detected	--------	7.34E-02
TL-201	Not Detected	--------	4.16E-01
XE-133	Not Detected	--------	4.33E-01
Y-88	Not Detected	--------	4.61E-02
ZN-65	Not Detected	--------	1.64E-01
ZR-95	Not Detected	--------	9.33E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-29-95 4:31:10 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024818-1A
Lab Sample ID : 50049712

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 670.000 gram
Sample Date/Time : 6-27-95 12:55:00 PM
Acquire Start Date : 6-29-95 3:58:44 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.65
TH-234	Not Detected	--------	1.57
U-234	Not Detected	--------	2.59E+01
RA-226	1.33	7.46E-01	1.10
PB-214	7.43E-01	1.52E-01	1.32E-01
BI-214	7.09E-01	1.43E-01	1.18E-01
PB-210	Not Detected	--------	4.11E+02
TH-232	8.22E-01	3.19E-01	4.19E-01
RA-228	8.01E-01	2.89E-01	3.47E-01
AC-228	Not Detected	--------	4.32E-01
TH-228	7.57E-01	4.26E-01	1.04
RA-224	2.09	5.56E-01	8.24E-01
PB-212	9.37E-01	1.85E-01	8.13E-02
BI-212	1.05	5.13E-01	6.94E-01
TL-208	8.36E-01	1.97E-01	1.93E-01
U-235	Not Detected	--------	4.83E-01
TH-231	Not Detected	--------	1.23
PA-231	Not Detected	--------	2.68
AC-227	Not Detected	--------	3.38
TH-227	Not Detected	--------	7.48E-01
RA-223	Not Detected	--------	4.45E-01
RN-219	Not Detected	--------	5.91E-01
PB-211	Not Detected	--------	1.44
TL-207	Not Detected	--------	2.78E+01
AM-241	Not Detected	--------	1.01
PU-239	Not Detected	--------	5.45E+02
NP-237	Not Detected	--------	8.06E-01
PA-233	Not Detected	--------	1.17E-01
TH-229	Not Detected	--------	5.92E-01

[Summary Report] - Sample ID: 50049712

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.81E-02
AR-41	Not Detected	--------	2.44E+07
BA-133	Not Detected	--------	1.22E-01
BA-140	Not Detected	--------	2.51E-01
CD-109	Not Detected	--------	2.72
CD-115	Not Detected	--------	2.51E-01
CE-139	Not Detected	--------	6.61E-02
CE-141	Not Detected	--------	1.12E-01
CE-144	Not Detected	--------	4.62E-01
CO-56	Not Detected	--------	7.17E-02
CO-57	Not Detected	--------	6.37E-02
CO-58	Not Detected	--------	6.44E-02
CO-60	Not Detected	--------	7.40E-02
CR-51	Not Detected	--------	5.02E-01
CS-134	Not Detected	--------	1.00E-01
CS-137	1.80E-01	5.21E-02	5.76E-02
CU-64	Not Detected	--------	2.48E+02
EU-152	Not Detected	--------	4.81E-01
EU-154	Not Detected	--------	3.56E-01
EU-155	Not Detected	--------	2.97E-01
FE-59	Not Detected	--------	1.49E-01
GD-153	Not Detected	--------	2.44E-01
HG-203	Not Detected	--------	6.56E-02
I-131	Not Detected	--------	6.67E-02
IN-115m	Not Detected	--------	3.62E+02
IR-192	Not Detected	--------	5.92E-02
K-40	1.83E+01	2.73	6.01E-01
LA-140	Not Detected	--------	1.86E-01
MN-54	Not Detected	--------	6.78E-02
MN-56	Not Detected	--------	6.93E+04
MO-99	Not Detected	--------	9.00E-01
NA-22	Not Detected	--------	8.41E-02
NA-24	Not Detected	--------	6.36E-01
NB-95	Not Detected	--------	5.23E-01
ND-147	Not Detected	--------	4.88E-01
NI-57	Not Detected	--------	2.63E-01
BE-7	Not Detected	--------	5.13E-01
RU-103	Not Detected	--------	5.50E-02
RU-106	Not Detected	--------	5.86E-01
SB-122	Not Detected	--------	1.39E-01
SB-124	Not Detected	--------	6.47E-02
SB-125	Not Detected	--------	1.64E-01
SC-46	Not Detected	--------	1.02E-01
SR-85	Not Detected	--------	7.80E-02
TA-182	Not Detected	--------	2.98E-01
TA-183	Not Detected	--------	1.17
TE-132	Not Detected	--------	8.92E-02
TL-201	Not Detected	--------	4.93E-01
XE-133	Not Detected	--------	5.41E-01
Y-88	Not Detected	--------	5.51E-02
ZN-65	Not Detected	--------	2.07E-01
ZR-95	Not Detected	--------	1.16E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 12:20:16 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024819-1A
Lab Sample ID : 50049713

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 924.000 gram
Sample Date/Time : 6-27-95 12:57:00 PM
Acquire Start Date : 6-29-95 11:46:16 PM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.25
TH-234	Not Detected	--------	1.26
U-234	Not Detected	--------	1.82E+01
RA-226	1.02	5.22E-01	7.53E-01
PB-214	5.56E-01	1.16E-01	1.07E-01
BI-214	5.44E-01	1.10E-01	9.46E-02
PB-210	Not Detected	--------	3.30E+02
TH-232	7.33E-01	1.19E-01	2.51E-01
RA-228	5.33E-01	2.15E-01	2.75E-01
AC-228	9.40E-01	2.15E-01	1.88E-01
TH-228	8.79E-01	3.73E-01	7.35E-01
RA-224	1.84	4.58E-01	6.42E-01
PB-212	8.15E-01	1.56E-01	6.80E-02
BI-212	1.10	4.87E-01	6.61E-01
TL-208	6.59E-01	1.49E-01	1.38E-01
U-235	Not Detected	--------	3.88E-01
TH-231	Not Detected	--------	1.02
PA-231	Not Detected	--------	2.02
AC-227	Not Detected	--------	2.79
TH-227	Not Detected	--------	6.01E-01
RA-223	Not Detected	--------	3.74E-01
RN-219	Not Detected	--------	4.67E-01
PB-211	Not Detected	--------	1.21
TL-207	Not Detected	--------	2.24E+01
AM-241	Not Detected	--------	8.29E-01
PU-239	Not Detected	--------	4.54E+02
NP-237	Not Detected	--------	6.52E-01
PA-233	Not Detected	--------	9.62E-02
TH-229	Not Detected	--------	5.00E-01

[Summary Report] - Sample ID: 50049713

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	9.98E-02
AR-41	Not Detected	--------	3.64E+08
BA-133	Not Detected	--------	9.66E-02
BA-140	Not Detected	--------	2.07E-01
CD-109	Not Detected	--------	2.20
CD-115	Not Detected	--------	2.29E-01
CE-139	Not Detected	--------	5.19E-02
CE-141	Not Detected	--------	9.24E-02
CE-144	Not Detected	--------	4.03E-01
CO-56	Not Detected	--------	5.49E-02
CO-57	Not Detected	--------	5.17E-02
CO-58	Not Detected	--------	4.96E-02
CO-60	Not Detected	--------	6.07E-02
CR-51	Not Detected	--------	3.85E-01
CS-134	Not Detected	--------	7.70E-02
CS-137	4.60E-01	8.16E-02	5.75E-02
CU-64	Not Detected	--------	2.85E+02
EU-152	Not Detected	--------	3.85E-01
EU-154	Not Detected	--------	2.83E-01
EU-155	Not Detected	--------	2.44E-01
FE-59	Not Detected	--------	1.11E-01
GD-153	Not Detected	--------	1.97E-01
HG-203	Not Detected	--------	5.03E-02
I-131	Not Detected	--------	5.72E-02
IN-115m	Not Detected	--------	9.90E+02
IR-192	Not Detected	--------	4.49E-02
K-40	1.56E+01	2.28	4.53E-01
LA-140	Not Detected	--------	1.52E-01
MN-54	Not Detected	--------	5.46E-02
MN-56	Not Detected	--------	4.26E+05
MO-99	Not Detected	--------	7.15E-01
NA-22	Not Detected	--------	7.28E-02
NA-24	Not Detected	--------	8.54E-01
NB-95	Not Detected	--------	4.44E-01
ND-147	Not Detected	--------	3.51E-01
NI-57	Not Detected	--------	2.03E-01
BE-7	Not Detected	--------	4.31E-01
RU-103	Not Detected	--------	4.76E-02
RU-106	Not Detected	--------	4.68E-01
SB-122	Not Detected	--------	1.28E-01
SB-124	Not Detected	--------	4.94E-02
SB-125	Not Detected	--------	1.40E-01
~~SC-46~~	~~9.33E-02~~	~~4.10E-02~~	5.51E-02 Not detected
SR-85	Not Detected	--------	6.18E-02
TA-182	Not Detected	--------	2.43E-01
TA-183	Not Detected	--------	9.99E-01
TE-132	Not Detected	--------	7.73E-02
TL-201	Not Detected	--------	4.33E-01
XE-133	Not Detected	--------	4.84E-01
Y-88	Not Detected	--------	4.29E-02
ZN-65	Not Detected	--------	1.63E-01
ZR-95	Not Detected	--------	8.37E-02

JR 7/3/95

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

6-30-95 1:00:54 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024820-1A
Lab Sample ID : 50049714

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 914.000 gram
Sample Date/Time : 6-27-95 12:59:00 PM
Acquire Start Date : 6-30-95 12:27:03 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.12
TH-234	Not Detected	--------	1.29
U-234	Not Detected	--------	1.98E+01
RA-226	1.80	8.70E-01	1.27
PB-214	5.62E-01	1.20E-01	1.14E-01
BI-214	4.96E-01	1.06E-01	9.73E-02
PB-210	Not Detected	--------	3.31E+02
TH-232	7.26E-01	2.21E-01	2.50E-01
RA-228	1.02	3.00E-01	2.03E-01
AC-228	8.06E-01	1.96E-01	1.81E-01
TH-228	1.15	4.30E-01	7.66E-01
RA-224	1.68	4.37E-01	6.77E-01
PB-212	8.93E-01	1.67E-01	6.56E-02
BI-212	7.26E-01	4.36E-01	6.36E-01
TL-208	7.90E-01	1.62E-01	1.30E-01
U-235	Not Detected	--------	3.95E-01
TH-231	Not Detected	--------	9.51E-01
PA-231	Not Detected	--------	2.08
AC-227	Not Detected	--------	2.91
TH-227	Not Detected	--------	6.21E-01
RA-223	Not Detected	--------	3.49E-01
RN-219	Not Detected	--------	4.67E-01
PB-211	Not Detected	--------	1.10
TL-207	Not Detected	--------	2.13E+01
AM-241	Not Detected	--------	8.50E-01
PU-239	Not Detected	--------	4.65E+02
NP-237	Not Detected	--------	6.05E-01
PA-233	Not Detected	--------	9.77E-02
TH-229	Not Detected	--------	4.76E-01

[Summary Report] - Sample ID: 50049714

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.33E-02
AR-41	Not Detected	--------	4.71E+08
BA-133	Not Detected	--------	9.71E-02
BA-140	Not Detected	--------	1.85E-01
CD-109	Not Detected	--------	2.09
CD-115	Not Detected	--------	2.34E-01
CE-139	Not Detected	--------	5.12E-02
CE-141	Not Detected	--------	9.49E-02
CE-144	Not Detected	--------	4.02E-01
CO-56	Not Detected	--------	5.23E-02
CO-57	Not Detected	--------	5.26E-02
CO-58	Not Detected	--------	4.96E-02
CO-60	Not Detected	--------	6.36E-02
CR-51	Not Detected	--------	3.79E-01
CS-134	Not Detected	--------	7.45E-02
CS-137	1.65E-01	4.51E-02	5.00E-02
CU-64	Not Detected	--------	2.98E+02
EU-152	Not Detected	--------	3.89E-01
EU-154	Not Detected	--------	2.89E-01
EU-155	Not Detected	--------	2.37E-01
FE-59	Not Detected	--------	1.22E-01
GD-153	Not Detected	--------	1.99E-01
HG-203	Not Detected	--------	5.18E-02
I-131	Not Detected	--------	5.81E-02
IN-115m	Not Detected	--------	1.11E+03
IR-192	Not Detected	--------	4.40E-02
K-40	1.85E+01	2.67	4.48E-01
LA-140	Not Detected	--------	1.79E-01
MN-54	Not Detected	--------	5.51E-02
MN-56	Not Detected	--------	4.83E+05
MO-99	Not Detected	--------	7.90E-01
NA-22	Not Detected	--------	7.05E-02
NA-24	Not Detected	--------	8.72E-01
NB-95	Not Detected	--------	4.61E-01
ND-147	Not Detected	--------	3.91E-01
NI-57	Not Detected	--------	2.66E-01
BE-7	Not Detected	--------	4.34E-01
RU-103	Not Detected	--------	4.32E-02
RU-106	Not Detected	--------	4.64E-01
SB-122	Not Detected	--------	1.22E-01
SB-124	Not Detected	--------	4.97E-02
SB-125	Not Detected	--------	1.31E-01
SC-46	Not Detected	--------	8.21E-02
SR-85	Not Detected	--------	6.02E-02
TA-182	Not Detected	--------	2.37E-01
TA-183	Not Detected	--------	1.02
TE-132	Not Detected	--------	8.32E-02
TL-201	Not Detected	--------	4.60E-01
XE-133	Not Detected	--------	4.87E-01
Y-88	Not Detected	--------	4.77E-02
ZN-65	Not Detected	--------	1.57E-01
ZR-95	Not Detected	--------	8.77E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

6-30-95 1:41:04 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024821-1A
Lab Sample ID : 50049715

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 913.000 gram
Sample Date/Time : 6-27-95 1:03:00 PM
Acquire Start Date : 6-30-95 1:07:05 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.53
TH-234	Not Detected	--------	1.29
U-234	Not Detected	--------	1.97E+01
RA-226	1.23	7.66E-01	1.16
PB-214	5.80E-01	1.24E-01	1.20E-01
BI-214	5.98E-01	1.16E-01	9.18E-02
PB-210	Not Detected	--------	3.28E+02
TH-232	8.33E-01	2.60E-01	3.08E-01
RA-228	6.81E-01	2.36E-01	2.84E-01
AC-228	8.18E-01	1.95E-01	1.75E-01
TH-228	9.64E-01	4.55E-01	8.03E-01
RA-224	1.95	4.77E-01	6.55E-01
PB-212	8.52E-01	1.62E-01	6.50E-02
BI-212	6.12E-01	4.72E-01	7.24E-01
TL-208	8.54E-01	1.66E-01	1.13E-01
U-235	Not Detected	--------	3.92E-01
TH-231	Not Detected	--------	9.80E-01
PA-231	Not Detected	--------	2.10
AC-227	Not Detected	--------	3.05
TH-227	Not Detected	--------	6.09E-01
RA-223	Not Detected	--------	3.59E-01
RN-219	Not Detected	--------	4.48E-01
PB-211	Not Detected	--------	1.14
TL-207	Not Detected	--------	2.27E+01
AM-241	Not Detected	--------	9.02E-01
PU-239	Not Detected	--------	4.65E+02
NP-237	Not Detected	--------	6.38E-01
PA-233	Not Detected	--------	9.57E-02
TH-229	Not Detected	--------	5.07E-01

[Summary Report] - Sample ID: 50049715

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.59E-02
AR-41	Not Detected	--------	5.77E+08
BA-133	Not Detected	--------	9.68E-02
BA-140	Not Detected	--------	2.08E-01
CD-109	Not Detected	--------	2.22
CD-115	Not Detected	--------	2.44E-01
CE-139	Not Detected	--------	5.30E-02
CE-141	Not Detected	--------	9.26E-02
CE-144	Not Detected	--------	4.09E-01
CO-56	Not Detected	--------	5.62E-02
CO-57	Not Detected	--------	5.25E-02
CO-58	Not Detected	--------	5.36E-02
CO-60	Not Detected	--------	6.07E-02
CR-51	Not Detected	--------	3.94E-01
CS-134	Not Detected	--------	7.89E-02
CS-137	1.79E-01	4.63E-02	4.91E-02
CU-64	Not Detected	--------	3.15E+02
EU-152	Not Detected	--------	4.06E-01
EU-154	Not Detected	--------	2.89E-01
EU-155	Not Detected	--------	2.50E-01
FE-59	Not Detected	--------	1.24E-01
GD-153	Not Detected	--------	2.01E-01
HG-203	Not Detected	--------	5.08E-02
I-131	Not Detected	--------	5.52E-02
IN-115m	Not Detected	--------	1.26E+03
IR-192	Not Detected	--------	4.52E-02
K-40	1.89E+01	2.72	5.03E-01
LA-140	Not Detected	--------	1.61E-01
MN-54	Not Detected	--------	5.56E-02
MN-56	Not Detected	--------	6.09E+05
MO-99	Not Detected	--------	7.21E-01
NA-22	Not Detected	--------	6.73E-02
NA-24	Not Detected	--------	8.05E-01
NB-95	Not Detected	--------	4.54E-01
ND-147	Not Detected	--------	3.84E-01
NI-57	Not Detected	--------	2.36E-01
BE-7	Not Detected	--------	4.23E-01
RU-103	Not Detected	--------	4.77E-02
RU-106	Not Detected	--------	4.60E-01
SB-122	Not Detected	--------	1.37E-01
SB-124	Not Detected	--------	5.14E-02
SB-125	Not Detected	--------	1.47E-01
SC-46	Not Detected	--------	8.10E-02
SR-85	Not Detected	--------	6.36E-02
TA-182	Not Detected	--------	2.37E-01
TA-183	Not Detected	--------	1.08
TE-132	Not Detected	--------	8.02E-02
TL-201	Not Detected	--------	4.58E-01
XE-133	Not Detected	--------	4.83E-01
Y-88	Not Detected	--------	3.95E-02
ZN-65	Not Detected	--------	1.67E-01
ZR-95	Not Detected	--------	9.73E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 2:20:52 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

ıstomer : M.YOUNG/E.RANKIN (7585/SMO)
ıstomer Sample ID : 024822-1A
ab Sample ID : 50049716

ample Description : MARINELLI SOIL SAMPLE
ample Type : Solid
ample Geometry : 2SMAR
ample Quantity : 845.000 gram
ample Date/Time : 6-27-95 1:10:00 PM
cquire Start Date : 6-30-95 1:47:17 AM
etector Name : LAB02
lapsed Live Time : 1800 seconds
lapsed Real Time : 1801 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.58
TH-234	Not Detected	--------	1.34
U-234	Not Detected	--------	1.87E+01
RA-226	1.48	8.60E-01	1.29
PB-214	7.29E-01	1.39E-01	1.09E-01
BI-214	6.13E-01	1.22E-01	1.01E-01
PB-210 --	Not Detected	--------	3.47E+02
TH-232	8.37E-01	2.91E-01	3.69E-01
RA-228	7.81E-01	2.68E-01	2.16E-01
AC-228	Not Detected	--------	3.54E-01
TH-228	Not Detected	--------	1.63
RA-224	2.05	5.08E-01	7.13E-01
PB-212	8.75E-01	1.68E-01	7.29E-02
BI-212	1.35	4.77E-01	5.68E-01
TL-208	7.63E-01	1.65E-01	1.43E-01
U-235	Not Detected	--------	4.04E-01
TH-231	Not Detected	--------	1.04
PA-231	Not Detected	--------	2.27
AC-227	Not Detected	--------	3.05
TH-227	Not Detected	--------	6.45E-01
RA-223	Not Detected	--------	3.84E-01
RN-219	Not Detected	--------	5.17E-01
PB-211	Not Detected	--------	1.24
TL-207	Not Detected	--------	2.14E+01
AM-241	Not Detected	--------	9.26E-01
PU-239	Not Detected	--------	4.72E+02
NP-237	Not Detected	--------	6.78E-01
PA-233	Not Detected	--------	1.03E-01
TH-229	Not Detected	--------	5.11E-01

[Summary Report] - Sample ID: 50049716

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.67E-02
AR-41	Not Detected	--------	8.05E+08
BA-133	Not Detected	--------	1.08E-01
BA-140	Not Detected	--------	2.04E-01
CD-109	Not Detected	--------	2.24
CD-115	Not Detected	--------	2.56E-01
CE-139	Not Detected	--------	5.42E-02
CE-141	Not Detected	--------	9.78E-02
CE-144	Not Detected	--------	4.10E-01
CO-56	Not Detected	--------	6.11E-02
CO-57	Not Detected	--------	5.70E-02
CO-58	Not Detected	--------	5.37E-02
CO-60	Not Detected	--------	6.19E-02
CR-51	Not Detected	--------	4.32E-01
CS-134	Not Detected	--------	8.39E-02
CS-137	1.62E-01	4.77E-02	5.56E-02
CU-64	Not Detected	--------	3.49E+02
EU-152	Not Detected	--------	4.31E-01
EU-154	Not Detected	--------	3.25E-01
EU-155	Not Detected	--------	2.50E-01
FE-59	Not Detected	--------	1.17E-01
GD-153	Not Detected	--------	2.12E-01
HG-203	Not Detected	--------	5.71E-02
I-131	Not Detected	--------	6.15E-02
IN-115m	Not Detected	--------	1.43E+03
IR-192	Not Detected	--------	4.95E-02
K-40	1.78E+01	2.59	4.60E-01
LA-140	Not Detected	--------	1.70E-01
MN-54	Not Detected	--------	6.14E-02
MN-56 --	Not Detected	--------	7.68E+05
MO-99	Not Detected	--------	8.11E-01
NA-22	Not Detected	--------	7.77E-02
NA-24	Not Detected	--------	9.07E-01
NB-95	Not Detected	--------	4.85E-01
ND-147	Not Detected	--------	3.72E-01
NI-57	Not Detected	--------	2.54E-01
BE-7	Not Detected	--------	4.23E-01
RU-103	Not Detected	--------	4.78E-02
RU-106	Not Detected	--------	4.85E-01
SB-122	Not Detected	--------	1.34E-01
SB-124	Not Detected	--------	5.30E-02
SB-125	Not Detected	--------	1.53E-01
SC-46	Not Detected	--------	9.28E-02
SR-85	Not Detected	--------	6.62E-02
TA-182	Not Detected	--------	2.74E-01
TA-183	Not Detected	--------	1.12
TE-132	Not Detected	--------	8.10E-02
TL-201	Not Detected	--------	4.63E-01
XE-133	Not Detected	--------	5.21E-01
Y-88	Not Detected	--------	5.25E-02
ZN-65	Not Detected	--------	1.80E-01
ZR-95	Not Detected	--------	1.01E-01

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

6-30-95 3:01:01 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024823-1A
Lab Sample ID : 50049717

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 752.000 gram
Sample Date/Time : 6-27-95 1:05:00 PM
Acquire Start Date : 6-30-95 2:27:04 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.98
TH-234	Not Detected	--------	1.45
U-234	Not Detected	--------	2.35E+01
RA-226	1.72	9.07E-01	1.34
PB-214	6.59E-01	1.36E-01	1.20E-01
BI-214	6.07E-01	1.34E-01	1.30E-01
PB-210	Not Detected	--------	3.61E+02
TH-232	6.67E-01	2.29E-01	2.74E-01
RA-228	9.34E-01	2.61E-01	2.45E-01
AC-228	Not Detected	--------	3.63E-01
TH-228	8.57E-01	4.16E-01	8.70E-01
RA-224	1.93	4.98E-01	7.28E-01
PB-212	9.57E-01	1.83E-01	7.32E-02
BI-212	8.71E-01	5.24E-01	7.65E-01
TL-208	7.42E-01	1.67E-01	1.49E-01
U-235	Not Detected	--------	4.35E-01
TH-231	Not Detected	--------	1.08
PA-231	Not Detected	--------	2.38
AC-227	Not Detected	--------	3.35
TH-227	Not Detected	--------	7.05E-01
RA-223	Not Detected	--------	3.97E-01
RN-219	Not Detected	--------	5.14E-01
PB-211	Not Detected	--------	1.30
TL-207	Not Detected	--------	2.34E+01
AM-241	Not Detected	--------	9.40E-01
PU-239	Not Detected	--------	5.01E+02
NP-237	Not Detected	--------	6.79E-01
PA-233	Not Detected	--------	1.15E-01
TH-229	Not Detected	--------	5.62E-01

[Summary Report] - Sample ID: 50049717

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	9.48E-02
AR-41	Not Detected	--------	1.04E+09
BA-133	Not Detected	--------	1.16E-01
BA-140	Not Detected	--------	2.30E-01
CD-109	Not Detected	--------	1.48
CD-115	Not Detected	--------	2.65E-01
CE-139	Not Detected	--------	5.84E-02
CE-141	Not Detected	--------	1.01E-01
CE-144	Not Detected	--------	4.50E-01
CO-56	Not Detected	--------	6.87E-02
CO-57	Not Detected	--------	6.08E-02
CO-58	Not Detected	--------	5.35E-02
CO-60	Not Detected	--------	6.86E-02
CR-51	Not Detected	--------	4.49E-01
CS-134	Not Detected	--------	9.02E-02
CS-137	2.48E-01	5.94E-02	5.91E-02
CU-64	Not Detected	--------	4.02E+02
EU-152	Not Detected	--------	4.88E-01
EU-154	Not Detected	--------	3.47E-01
EU-155	Not Detected	--------	2.66E-01
FE-59	Not Detected	--------	1.37E-01
GD-153	Not Detected	--------	2.22E-01
HG-203	Not Detected	--------	6.04E-02
I-131	Not Detected	--------	6.79E-02
IN-115m	Not Detected	--------	1.64E+03
IR-192	Not Detected	--------	5.37E-02
K-40	1.91E+01	2.81	5.78E-01
LA-140	Not Detected	--------	2.03E-01
MN-54	Not Detected	--------	6.48E-02
MN-56	Not Detected	--------	1.05E+06
MO-99 --	Not Detected	--------	8.90E-01
NA-22	Not Detected	--------	8.14E-02
NA-24	Not Detected	--------	1.00
NB-95	Not Detected	--------	5.33E-01
ND-147	Not Detected	--------	4.44E-01
NI-57	Not Detected	--------	2.90E-01
BE-7	Not Detected	--------	4.72E-01
RU-103	Not Detected	--------	5.28E-02
RU-106	Not Detected	--------	5.20E-01
SB-122	Not Detected	--------	1.49E-01
SB-124	Not Detected	--------	5.84E-02
SB-125	Not Detected	--------	1.55E-01
SC-46	Not Detected	--------	9.63E-02
SR-85	Not Detected	--------	7.31E-02
TA-182	Not Detected	--------	2.86E-01
TA-183	Not Detected	--------	1.14
TE-132	Not Detected	--------	9.09E-02
TL-201	Not Detected	--------	5.21E-01
XE-133	Not Detected	--------	5.50E-01
Y-88	Not Detected	--------	4.80E-02
ZN-65	Not Detected	--------	1.87E-01
ZR-95	Not Detected	--------	1.18E-01

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*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program [881 Laboratory]
* 6-30-95 9:02:30 AM
*
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Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
Lab Sample ID : 50049718

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 6-30-95 8:50:17 AM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.65E+04
TH-234	Not Detected	--------	5.24E+03
U-234	Not Detected	--------	1.26E+05
RA-226	Not Detected	--------	6.58E+03
PB-214	Not Detected	--------	7.58E+02
BI-214	Not Detected	--------	6.97E+02
PB-210	Not Detected	--------	6.83E+06
TH-232	Not Detected	--------	2.16E+03
RA-228	Not Detected	--------	3.02E+03
AC-228	Not Detected	--------	1.86E+03
TH-228	Not Detected	--------	4.14E+04
RA-224	Not Detected	--------	3.41E+04
PB-212	Not Detected	--------	3.12E+03
BI-212	Not Detected	--------	2.77E+04
TL-208	Not Detected	--------	5.59E+03
U-235	Not Detected	--------	1.95E+03
TH-231	Not Detected	--------	4.36E+03
PA-231	Not Detected	--------	1.06E+04
AC-227	Not Detected	--------	1.73E+04
TH-227	Not Detected	--------	2.61E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	3.31E+03
PB-211	Not Detected	--------	9.86E+03
TL-207	Not Detected	--------	2.35E+05
AM-241	9.80E+04	1.92E+04	6.80E+03
PU-239	Not Detected	--------	2.25E+06
NP-237	Not Detected	--------	3.03E+03
PA-233	Not Detected	--------	6.64E+02
TH-229	Not Detected	--------	2.43E+03

[Summary Report] - Sample ID: 50049718

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	--------	1.84E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.99E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	4.09E+05	1.04E+05	1.16E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	1.45E+06
CE-141	Not Detected	--------	2.56E+18
CE-144	Not Detected	--------	1.26E+05
CO-56	Not Detected	--------	1.82E+09
CO-57	Not Detected	--------	2.12E+04
CO-58	Not Detected	--------	6.57E+09
CO-60	7.70E+04	1.00E+04	5.01E+02
CR-51	Not Detected	--------	8.02E+21
CS-134	Not Detected	--------	1.58E+03
CS-137	7.17E+04	9.25E+03	4.35E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	3.68E+03
EU-154	Not Detected	--------	2.45E+03
EU-155	Not Detected	--------	2.32E+03
FE-59	Not Detected	--------	3.07E+14
GD-153	Not Detected	--------	1.25E+05
HG-203	Not Detected	--------	3.06E+13
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.72E+09
K-40	Not Detected	--------	1.97E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	1.80E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	9.01E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-7	Not Detected	--------	1.44E+13
RU-103	Not Detected	--------	4.09E+15
RU-106	Not Detected	--------	8.20E+04
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	1.05E+11
SB-125	Not Detected	--------	3.84E+03
SC-46	Not Detected	--------	6.42E+08
SR-85	Not Detected	--------	3.11E+10
TA-182	Not Detected	--------	4.06E+07
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	1.23E+07
ZN-65	Not Detected	--------	1.30E+05
ZR-95	Not Detected	--------	6.56E+10

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 6-30-95 9:05:13 AM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 50049718
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 6-30-95 8:50:17 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.784E-02	3.508E-03	9.801E-02	<		:In	>
CS-137 Activity	6.974E-02	2.437E-03	7.172E-02	<			>
CO-60 Activity	7.702E-02	2.538E-03	7.669E-02	<			>

OK 7/3/95

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 7/3/95

Sandia National Laboratories

Justification for Class III Permit Modification

January 2008

SWMUs 8 And 58
Operable Unit 1332
Canyons Blast Area
Volume 3 of 4

CAC (Vols.1-3) Submitted April 2005
RSI Response Submitted March 2006
NOD Response Submitted January 2007

Environmental
Restoration
Project

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

SANDIA NATIONAL LABORATORIES ENVIRONMENTAL RESTORATION PROJECT CORRECTIVE ACTION COMPLETE PROPOSAL SOLID WASTE MANAGEMENT UNIT 8, OPEN DUMP (COYOTE CANYON BLAST AREA) AND SOLID WASTE MANAGEMENT UNIT 58, COYOTE CANYON BLAST AREA, FOOTHILLS TEST AREA

April 2005

Volume 3 of 3

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Feature 58FF

SF 2001-COC (9-94) 500501

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 2

AR/COC- 03860

Dept. No./Mail Stop: 7585
Project/Task Manager: Mike Young
Project Name: ADS 1332 Scoping Samp.
Record Center Code:
Logbook Ref No: pg. 18-19
SMO Reference No.: CF-0103

Date Samples Shipped: 6-29-95
Carrier/Waybill No: N/C
Lab Contact: Amir Mohazheghi
Lab Destination: SNL 7715
SMO Contact/Phone: MACK
Send Report to SMO: DEBORAH McLAUGHLIN

Contract No.: NA
Case No.: 3678.600
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location — Tech Area: Site 58
Building: NA Room: NA

Parameter & Method Requested: GAMMA SPEC.

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	GAMMA SPEC.	Lab Sample ID
024824-01	58-GR-018-0-SS	0	58	6/28/95 1215	S	P	500 ml	NONE	G	SA	X	
024825-01	019 = 101 ✓			1240							X	
024826-01	020 = 103 ✓			1245							X	
024827-01	021 = 102 ✓			1300							X	
024828-01	022			1305							X	
024829-01	023 = 104 ✓			1308							X	
024830-01	024 = 105 ✓			1310							X	
024831-01	025 = 106 ✓			1313							X	
024832-01	026			1315							X	
024833-01	027 = 108 ✓			1318							X	

RMMA ☐ Yes ☒ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking — Date Entered (mm/dd/yy): Entered by: QC Inits:

Special Instructions/QC Requirements:
Jan 1999 sample number. i.e.
108 = 558FF-GR-108-0-SS

Abnormal Conditions on Receipt

LAB USE

Sample Team Members	Name	Signature	Init.	Company/Organization
	Cheryl Duff	Cheryl Duff	CD	ZAT / 7584
	Concetta Sciacato	Concetta Sciacato	CL	LMI / 7584

1. Relinquished by		Org. IT / 7584	Date 6-30-95	Time 0948	4. Relinquished by	Org.	Date	Time
1. Received by		Org. SMO 7513	Date 6-29-95	Time 0998	4. Received by	Org.	Date	Time
2. Relinquished by		Org. SMO 7513	Date 6-29-95	Time 1053	5. Relinquished by	Org.	Date	Time
2. Received by		Org. SNL 7715	Date 6/29/95	Time 1057	5. Received by	Org.	Date	Time
3. Relinquished by		Org. SNL 7715	Date 7/5/95	Time 855	6. Relinquished by	Org.	Date	Time
3. Received by		Org. SMO 7513	Date 7/5/95	Time 855	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

SF 2001-COD (9-94)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC- 038600

Scoping Sampling

Project Name: ADS 1332 Project/Task Manager: Mike Young Case No.: 36281600

Location Tech Area Site 58

Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: GAMMA SPEC.	Lab Sample ID
024834-01	58-GR-028=0-55 = 109 ✓	0	58	62895 1320	S	P	500 ml	NONE	G	SA	X	LAB USE
024835-01	-029 = 110 ✓			1340							X	
024836-01	030 =			1342							X	
024837-01	031 = 111 ✓			1345							X	
024838-01	032 = 112 ✓			1348							X	
024839-01	033 = 113 ✓			1350							X	
024840-01	034 = 105 ✓	↓	↓	↓ 1353	↓	↓	↓	↓	↓	↓	X	

Abnormal Conditions on Receipt

Recipient Initials

LAB USE

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 3:39:55 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024824-1
Lab Sample ID : 50050101

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 823.000 gram
Sample Date/Time : 6-28-95 12:15:00 PM
Acquire Start Date : 6-30-95 3:07:28 AM
Detector Name : LAB02
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.64
TH-234	Not Detected	--------	1.34
U-234	Not Detected	--------	1.90E+01
RA-226	1.17	9.23E-01	1.44
PB-214	6.45E-01	1.29E-01	1.10E-01
BI-214	6.39E-01	1.25E-01	1.00E-01
PB-210	Not Detected	--------	3.35E+02
TH-232	8.70E-01	2.99E-01	3.76E-01
RA-228	6.97E-01	2.89E-01	3.86E-01
AC-228	Not Detected	--------	3.43E-01
TH-228	7.95E-01	3.83E-01	7.37E-01
RA-224	1.76	5.14E-01	7.81E-01
PB-212	8.26E-01	1.97E-01	7.40E-02
BI-212	8.21E-01	4.19E-01	5.76E-01
TL-208	6.74E-01	1.41E-01	1.00E-01
U-235	Not Detected	--------	4.03E-01
TH-231	Not Detected	--------	1.00
PA-231	Not Detected	--------	2.19
AC-227	Not Detected	--------	2.96
TH-227	Not Detected	--------	6.41E-01
RA-223	Not Detected	--------	3.51E-01
RN-219	Not Detected	--------	4.87E-01
PB-211	Not Detected	--------	1.10
TL-207	Not Detected	--------	2.36E+01
AM-241	Not Detected	--------	8.98E-01
PU-239	Not Detected	--------	4.74E+02
NP-237	Not Detected	--------	6.36E-01
PA-233	Not Detected	--------	9.95E-02
TH-229	Not Detected	--------	5.28E-01

[Summary Report] - Sample ID: 50050101

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.27E-02
AR-41	Not Detected	--------	2.01E+05
BA-133	Not Detected	--------	1.05E-01
BA-140	Not Detected	--------	2.08E-01
CD-109	Not Detected	--------	2.18
CD-115	Not Detected	--------	1.85E-01
CE-139	Not Detected	--------	5.38E-02
CE-141	Not Detected	--------	9.23E-02
CE-144	Not Detected	--------	4.08E-01
CO-56	Not Detected	--------	6.30E-02
CO-57	Not Detected	--------	5.40E-02
CO-58	Not Detected	--------	5.44E-02
CO-60	Not Detected	--------	6.58E-02
CR-51	Not Detected	--------	4.19E-01
CS-134	Not Detected	--------	8.60E-02
CS-137	1.74E-01	5.10E-02	5.99E-02
CU-64	Not Detected	--------	1.11E+02
EU-152	Not Detected	--------	4.35E-01
EU-154	Not Detected	--------	3.05E-01
EU-155	Not Detected	--------	2.61E-01
FE-59	Not Detected	--------	1.24E-01
GD-153	Not Detected	--------	2.13E-01
HG-203	Not Detected	--------	5.36E-02
I-131	Not Detected	--------	5.52E-02
IN-115m	Not Detected	--------	4.76E+01
IR-192	Not Detected	--------	4.99E-02
K-40	1.90E+01	2.76	4.56E-01
LA-140	Not Detected	--------	1.11E-01
MN-54	Not Detected	--------	5.80E-02
MN-56	Not Detected	--------	2.31E+03
MO-99	Not Detected	--------	6.83E-01
NA-22	Not Detected	--------	7.80E-02
NA-24	Not Detected	--------	3.56E-01
NB-95	Not Detected	--------	4.03E-01
ND-147	Not Detected	--------	3.71E-01
NI-57	Not Detected	--------	1.90E-01
BE-7	Not Detected	--------	4.42E-01
RU-103	Not Detected	--------	4.82E-02
RU-106	Not Detected	--------	5.14E-01
SB-122	Not Detected	--------	9.80E-02
SB-124	Not Detected	--------	5.31E-02
SB-125	Not Detected	--------	1.49E-01
SC-46	Not Detected	--------	8.69E-02
SR-85	Not Detected	--------	6.25E-02
TA-182	Not Detected	--------	2.51E-01
TA-183	Not Detected	--------	9.68E-01
TE-132	Not Detected	--------	6.78E-02
TL-201	Not Detected	--------	3.86E-01
XE-133	Not Detected	--------	3.74E-01
Y-88	Not Detected	--------	4.01E-02
ZN-65	Not Detected	--------	1.72E-01
ZR-95	Not Detected	--------	1.03E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 4:17:41 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

ıstomer : M.YOUNG/E.RANKIN (7585/SMO)
ıstomer Sample ID : 024825-1
ab Sample ID : 50050102

Sample No.
044119-001
-002

ample Description : MARINELLI SOIL SAMPLE
ample Type : Solid
ample Geometry : 2SMAR
ample Quantity : 864.000 gram
ample Date/Time : 6-28-95 12:40:00 PM
cquire Start Date : 6-30-95 3:45:11 AM
etector Name : LAB02
apsed Live Time : 1800 seconds
apsed Real Time : 1801 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.67
TH-234	Not Detected	--------	1.37
U-234	Not Detected	--------	2.08E+01
RA-226	1.54	8.50E-01	1.27
PB-214	6.21E-01	1.28E-01	1.17E-01
BI-214	5.64E-01	1.17E-01	1.04E-01
PB-210	Not Detected	--------	3.54E+02
TH-232	6.22E-01	1.93E-01	2.11E-01
RA-228	6.98E-01	2.37E-01	1.91E-01
AC-228	Not Detected	--------	3.49E-01
TH-228	5.13E-01	3.42E-01	8.52E-01
RA-224	1.78	4.63E-01	6.96E-01
PB-212	8.06E-01	1.57E-01	6.95E-02
BI-212	6.55E-01	3.96E-01	5.71E-01
TL-208	7.59E-01	1.68E-01	1.56E-01
U-235	Not Detected	--------	4.06E-01
TH-231	Not Detected	--------	1.01
PA-231	Not Detected	--------	2.20
AC-227	Not Detected	--------	2.86
TH-227	Not Detected	--------	6.30E-01
RA-223	Not Detected	--------	3.52E-01
RN-219	Not Detected	--------	4.85E-01
PB-211	Not Detected	--------	1.18
TL-207	Not Detected	--------	2.12E+01
AM-241	Not Detected	--------	9.27E-01
PU-239	Not Detected	--------	4.90E+02
NP-237	Not Detected	--------	6.43E-01
PA-233	Not Detected	--------	1.06E-01
TH-229	Not Detected	--------	5.08E-01

044119-001
-002

[Summary Report] - Sample ID: 50050102

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.09E-01
AR-41	Not Detected	--------	2.06E+05
BA-133	Not Detected	--------	1.04E-01
BA-140	Not Detected	--------	1.86E-01
CD-109	Not Detected	--------	2.24
CD-115	Not Detected	--------	1.85E-01
CE-139	Not Detected	--------	5.52E-02
CE-141	Not Detected	--------	9.52E-02
CE-144	Not Detected	--------	4.27E-01
CO-56	Not Detected	--------	5.77E-02
CO-57	Not Detected	--------	5.59E-02
CO-58	Not Detected	--------	5.36E-02
CO-60	Not Detected	--------	5.97E-02
CR-51	Not Detected	--------	4.12E-01
CS-134	Not Detected	--------	7.98E-02
CS-137	5.36E-01	1.13E-01	4.04E-02
CU-64	Not Detected	--------	9.76E+01
EU-152	Not Detected	--------	4.20E-01
EU-154	Not Detected	--------	2.95E-01
EU-155	Not Detected	--------	2.48E-01
FE-59	Not Detected	--------	1.20E-01
GD-153	Not Detected	--------	2.07E-01
HG-203	Not Detected	--------	5.31E-02
I-131	Not Detected	--------	5.60E-02
IN-115m	Not Detected	--------	4.90E+01
IR-192	Not Detected	--------	4.90E-02
K-40	1.77E+01	2.59	6.19E-01
LA-140	Not Detected	--------	1.22E-01
MN-54	Not Detected	--------	5.47E-02
MN-56	Not Detected	--------	2.24E+03
MO-99	Not Detected	--------	5.83E-01
NA-22	Not Detected	--------	7.34E-02
NA-24	Not Detected	--------	3.37E-01
NB-95	Not Detected	--------	4.00E-01
ND-147	Not Detected	--------	3.53E-01
NI-57	Not Detected	--------	1.77E-01
BE-7	Not Detected	--------	4.52E-01
RU-103	Not Detected	--------	5.01E-02
RU-106	Not Detected	--------	4.96E-01
SB-122	Not Detected	--------	1.03E-01
SB-124	Not Detected	--------	5.21E-02
SB-125	Not Detected	--------	1.59E-01
SC-46	Not Detected	--------	8.76E-02
SR-85	Not Detected	--------	6.45E-02
TA-182	Not Detected	--------	2.58E-01
TA-183	Not Detected	--------	1.00
TE-132	Not Detected	--------	6.75E-02
TL-201	Not Detected	--------	3.77E-01
XE-133	Not Detected	--------	3.85E-01
Y-88	Not Detected	--------	4.46E-02
ZN-65	Not Detected	--------	1.73E-01
ZR-95	Not Detected	--------	1.01E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 4:54:36 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

istomer : M.YOUNG/E.RANKIN (7585/SMO)
istomer Sample ID : 024826-1
ab Sample ID : 50050103

Sample No.
044121-001
-002

umple Description : MARINELLI SOIL SAMPLE
umple Type : Solid
umple Geometry : 2SMAR
umple Quantity : 847.000 gram
umple Date/Time : 6-28-95 12:45:00 PM
:quire Start Date : 6-30-95 4:22:05 AM
:tector Name : LAB02
.apsed Live Time : 1800 seconds
.apsed Real Time : 1801 seconds

)mments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	5.65
TH-234	Not Detected	--------	1.30
U-234	Not Detected	--------	2.17E+01
RA-226	1.38	7.82E-01	1.17
PB-214	6.22E-01	1.23E-01	1.01E-01
BI-214	5.67E-01	1.15E-01	9.64E-02
PB-210	Not Detected	--------	3.46E+02
TH-232	6.67E-01	2.42E-01	3.08E-01
RA-228	8.90E-01	3.63E-01	1.99E-01
AC-228	9.34E-01	2.24E-01	2.07E-01
TH-228	Not Detected	--------	1.55
RA-224	1.62	4.67E-01	7.90E-01
PB-212	8.77E-01	1.82E-01	7.14E-02
BI-212	7.68E-01	4.53E-01	6.56E-01
TL-208	7.67E-01	1.64E-01	1.37E-01
U-235	Not Detected	--------	4.19E-01
TH-231	Not Detected	--------	1.04
PA-231	Not Detected	--------	2.15
AC-227	Not Detected	--------	3.12
TH-227	Not Detected	--------	6.43E-01
RA-223	Not Detected	--------	3.62E-01
RN-219	Not Detected	--------	4.99E-01
PB-211	Not Detected	--------	1.18
TL-207	Not Detected	--------	2.22E+01
AM-241	Not Detected	--------	9.05E-01
PU-239	Not Detected	--------	4.89E+02
NP-237	Not Detected	--------	6.58E-01
PA-233	Not Detected	--------	1.07E-01
TH-229	Not Detected	--------	5.32E-01

ıry Report] - Sample ID: 50050103

044121-001
-002

ıide	Activity (pCi/gram)	2S Error	MDA
ı10m	Not Detected	--------	1.15E-01
¦1	Not Detected	--------	2.75E+05
ı33	Not Detected	--------	1.05E-01
ı40	Not Detected	--------	2.05E-01
ı09	Not Detected	--------	1.32
ı15	Not Detected	--------	1.90E-01
ı39	Not Detected	--------	5.57E-02
ı41	Not Detected	--------	9.94E-02
ı44	Not Detected	--------	4.19E-01
56	Not Detected	--------	5.83E-02
57	Not Detected	--------	5.52E-02
58	Not Detected	--------	5.22E-02
60	Not Detected	--------	6.13E-02
51	Not Detected	--------	4.24E-01
134	Not Detected	--------	8.19E-02
137	5.75E-01	9.57E-02	5.41E-02
64	Not Detected	--------	1.04E+02
152	Not Detected	--------	4.14E-01
154	Not Detected	--------	3.17E-01
155	Not Detected	--------	2.52E-01
59	Not Detected	--------	1.22E-01
153	Not Detected	--------	2.04E-01
203	Not Detected	--------	5.56E-02
.31	Not Detected	--------	5.93E-02
·115m	Not Detected	--------	5.41E+01
·192	Not Detected	--------	5.14E-02
¦0	2.01E+01	2.89	4.47E-01
·140	Not Detected	--------	1.21E-01
-54	Not Detected	--------	5.93E-02
-56	Not Detected	--------	2.61E+03
-99	Not Detected	--------	6:03E-01
-22	Not Detected	--------	8.08E-02
-24	Not Detected	--------	3.60E-01
-95	Not Detected	--------	4.08E-01
-147	Not Detected	--------	3.98E-01
-57	Not Detected	--------	1.70E-01
-7	Not Detected	--------	4.79E-01
-103	Not Detected	--------	5.05E-02
-106	Not Detected	--------	4.86E-01
-122	Not Detected	--------	1.14E-01
-124	Not Detected	--------	5.49E-02
-125	Not Detected	--------	1.61E-01
-46	Not Detected	--------	8.74E-02
.-85	Not Detected	--------	6.56E-02
.-182	Not Detected	--------	2.55E-01
.-183	Not Detected	--------	9.88E-01
:-132	Not Detected	--------	6.87E-02
¡-201	Not Detected	--------	3.95E-01
:-133	Not Detected	--------	3.94E-01
88	Not Detected	--------	5.70E-02
ı-65	Not Detected	--------	1.72E-01
?-95	Not Detected	--------	9.90E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 5:31:51 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Sample No.
044120-001
-002

ıstomer : M.YOUNG/E.RANKIN (7585/SMO)
ıstomer Sample ID : 024827-1
ıb Sample ID : 50050104

ımple Description : MARINELLI SOIL SAMPLE
ımple Type : Solid
ımple Geometry : 2SMAR
ımple Quantity : 746.000 gram
ımple Date/Time : 6-28-95 1:00:00 PM
:quire Start Date : 6-30-95 4:59:16 AM
ɜtector Name : LAB02
Lapsed Live Time : 1800 seconds
Lapsed Real Time : 1801 seconds

ɔmments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	6.14
TH-234	Not Detected	--------	1.49
U-234	Not Detected	--------	2.09E+01
RA-226	1.26	1.13	1.78
PB-214	7.30E-01	1.56E-01	1.52E-01
BI-214	6.51E-01	1.38E-01	1.28E-01
PB-210	Not Detected	--------	4.03E+02
TH-232	8.87E-01	2.52E-01	2.59E-01
RA-228	9.65E-01	3.10E-01	2.38E-01
AC-228	1.14	2.55E-01	2.07E-01
TH-228	7.98E-01	4.37E-01	9.83E-01
RA-224	2.15	5.42E-01	7.64E-01
PB-212	9.10E-01	1.76E-01	7.67E-02
BI-212	7.50E-01	4.73E-01	6.92E-01
TL-208	7.34E-01	1.66E-01	1.47E-01
U-235	Not Detected	--------	4.57E-01
TH-231	Not Detected	--------	1.19
PA-231	Not Detected	--------	2.48
AC-227	Not Detected	--------	3.35
TH-227	Not Detected	--------	7.15E-01
RA-223	Not Detected	--------	4.16E-01
RN-219	Not Detected	--------	5.96E-01
PB-211	Not Detected	--------	1.41
TL-207	Not Detected	--------	2.36E+01
AM-241	Not Detected	--------	9.75E-01
PU-239	Not Detected	--------	5.49E+02
NP-237	Not Detected	--------	7.30E-01
PA-233	Not Detected	--------	1.23E-01
TH-229	Not Detected	--------	5.84E-01

mary Report] - Sample ID: 50050104

044120-001
-002

clide	Activity (pCi/gram)	2S Error	MDA
-110m	Not Detected	--------	1.46E-01
-41	Not Detected	--------	3.45E+05
-133	Not Detected	--------	1.15E-01
-140	Not Detected	--------	2.37E-01
-109	Not Detected	--------	2.45
-115	Not Detected	--------	2.26E-01
-139	Not Detected	--------	6.09E-02
-141	Not Detected	--------	1.06E-01
-144	Not Detected	--------	4.63E-01
-56	Not Detected	--------	7.23E-02
-57	Not Detected	--------	6.30E-02
-58	Not Detected	--------	6.08E-02
-60	Not Detected	--------	7.67E-02
-51	Not Detected	--------	4.76E-01
-134	Not Detected	--------	9.19E-02
-137	9.09E-01	1.41E-01	6.58E-02
-64	Not Detected	--------	1.19E+02
-152	Not Detected	--------	4.99E-01
-154	Not Detected	--------	3.46E-01
-155	Not Detected	--------	2.79E-01
-59	Not Detected	--------	1.29E-01
-153	Not Detected	--------	2.41E-01
-203	Not Detected	--------	6.38E-02
-131	Not Detected	--------	6.36E-02
-115m	Not Detected	--------	6.79E+01
-192	Not Detected	--------	5.81E-02
-40	2.03E+01	2.97	6.15E-01
-140	Not Detected	--------	1.34E-01
-54	Not Detected	--------	6.67E-02
-56	Not Detected	--------	3.58E+03
-99	Not Detected	--------	7.37E-01
-22	Not Detected	--------	7.92E-02
-24	Not Detected	--------	4.26E-01
-95	Not Detected	--------	4.57E-01
-147	Not Detected	--------	4.38E-01
-57	Not Detected	--------	2.10E-01
-7	Not Detected	--------	5.21E-01
-103	Not Detected	--------	5.81E-02
-106	Not Detected	--------	5.69E-01
-122	Not Detected	--------	1.26E-01
-124	Not Detected	--------	6.00E-02
-125	Not Detected	--------	1.78E-01
-46	Not Detected	--------	9.63E-02
-85	Not Detected	--------	7.47E-02
-182	Not Detected	--------	2.89E-01
-183	Not Detected	--------	1.02
-132	Not Detected	--------	8.02E-02
-201	Not Detected	--------	4.40E-01
-133	Not Detected	--------	4.49E-01
-88	Not Detected	--------	5.17E-02
-65	Not Detected	--------	1.85E-01
-95	Not Detected	--------	1.09E-01

[redacted]

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 2:00:03 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024828-1
Lab Sample ID : 50050105

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 1SMAR
Sample Quantity : 851.000 gram
Sample Date/Time : 6-28-95 1:05:00 PM
Acquire Start Date : 6-30-95 1:26:24 AM
Detector Name : LAB01
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.14
TH-234	7.28E-01	6.00E-01	9.06E-01
U-234	Not Detected	--------	1.80E+01
RA-226	1.32	7.44E-01	1.12
PB-214	5.45E-01	1.05E-01	8.21E-02
BI-214	Not Detected	--------	1.50E-01
PB-210	Not Detected	--------	4.92E+01
TH-232	5.30E-01	2.24E-01	3.07E-01
RA-228	7.31E-01	2.38E-01	1.73E-01
AC-228	Not Detected	--------	2.89E-01
TH-228	Not Detected	--------	1.41
RA-224	1.68	4.17E-01	5.97E-01
PB-212	6.76E-01	1.29E-01	5.79E-02
BI-212	6.92E-01	3.71E-01	5.23E-01
TL-208	4.78E-01	1.16E-01	1.13E-01
U-235	Not Detected	--------	3.29E-01
TH-231	Not Detected	--------	6.56E-01
PA-231	Not Detected	--------	1.96
AC-227	Not Detected	--------	2.46
TH-227	Not Detected	--------	5.25E-01
RA-223	Not Detected	--------	2.29E-01
RN-219	Not Detected	--------	4.13E-01
PB-211	Not Detected	--------	1.01
TL-207	Not Detected	--------	2.19E+01
AM-241	Not Detected	--------	2.80E-01
PU-239	Not Detected	--------	3.66E+02
NP-237	Not Detected	--------	2.32E-01
PA-233	Not Detected	--------	8.86E-02
TH-229	Not Detected	--------	3.41E-01

[Summary Report] - Sample ID: 50050105

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.43E-02
AR-41	Not Detected	--------	7.19E+04
BA-133	Not Detected	--------	8.83E-02
BA-140	Not Detected	--------	1.75E-01
CD-109	Not Detected	--------	7.99E-01
CD-115	Not Detected	--------	1.56E-01
CE-139	Not Detected	--------	4.68E-02
CE-141	Not Detected	--------	7.50E-02
CE-144	Not Detected	--------	3.32E-01
CO-56	Not Detected	--------	5.16E-02
CO-57	Not Detected	--------	4.24E-02
CO-58	Not Detected	--------	4.99E-02
CO-60	Not Detected	--------	5.74E-02
CR-51	Not Detected	--------	3.58E-01
CS-134	Not Detected	--------	7.19E-02
CS-137	3.44E-01	6.70E-02	5.75E-02
CU-64	Not Detected	--------	8.44E+01
EU-152	Not Detected	--------	3.58E-01
EU-154	Not Detected	--------	2.64E-01
EU-155	Not Detected	--------	1.76E-01
FE-59	Not Detected	--------	1.04E-01
GD-153	Not Detected	--------	1.40E-01
HG-203	Not Detected	--------	4.57E-02
I-131	Not Detected	--------	5.11E-02
IN-115m	Not Detected	--------	2.81E+01
IR-192	Not Detected	--------	4.26E-02
K-40	1.88E+01	2.69	4.37E-01
LA-140	Not Detected	--------	9.15E-02
MN-54	Not Detected	--------	4.89E-02
MN-56	Not Detected	--------	9.64E+02
MO-99	Not Detected	--------	6.01E-01
NA-22	Not Detected	--------	6.38E-02
NA-24	Not Detected	--------	2.85E-01
NB-95	Not Detected	--------	3.27E-01
ND-147	Not Detected	--------	3.24E-01
NI-57	Not Detected	--------	1.44E-01
BE-7	Not Detected	--------	3.88E-01
RU-103	Not Detected	--------	4.47E-02
RU-106	Not Detected	--------	4.19E-01
SB-122	Not Detected	--------	8.99E-02
SB-124	Not Detected	--------	5.24E-02
SB-125	Not Detected	--------	1.33E-01
SC-46	Not Detected	--------	7.87E-02
SR-85	Not Detected	--------	5.51E-02
TA-182	Not Detected	--------	2.35E-01
TA-183	Not Detected	--------	2.95E-01
TE-132	Not Detected	--------	5.83E-02
TL-201	Not Detected	--------	1.97E-01
XE-133	Not Detected	--------	2.57E-01
Y-88	Not Detected	--------	4.08E-02
ZN-65	Not Detected	--------	1.50E-01
ZR-95	Not Detected	--------	8.78E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 2:40:08 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 024829-1
ab Sample ID : 50050106

Sample No.
044122-001
-002

ample Description : MARINELLI SOIL SAMPLE
ample Type : Solid
ample Geometry : 1SMAR
ample Quantity : 797.000 gram
ample Date/Time : 6-28-95 1:08:00 PM
cquire Start Date : 6-30-95 2:06:18 AM
etector Name : LAB01
Lapsed Live Time : 1800 seconds
Lapsed Real Time : 1801 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.41
TH-234	Not Detected	--------	6.10E-01
U-234	Not Detected	--------	1.93E+01
RA-226	6.04E-01	9.62E-01	1.56
PB-214	6.97E-01	1.36E-01	1.21E-01
BI-214	5.83E-01	1.12E-01	8.72E-02
PB-210	Not Detected	--------	5.54E+01
TH-232	8.45E-01	2.61E-01	3.12E-01
RA-228	8.27E-01	2.64E-01	1.99E-01
AC-228	8.77E-01	2.13E-01	2.07E-01
TH-228	7.97E-01	3.69E-01	7.69E-01
RA-224	1.96	4.69E-01	6.60E-01
PB-212	8.29E-01	1.54E-01	6.17E-02
BI-212	1.02	4.51E-01	6.08E-01
TL-208	6.91E-01	1.49E-01	1.31E-01
U-235	Not Detected	--------	3.59E-01
TH-231	Not Detected	--------	7.02E-01
PA-231	Not Detected	--------	2.18
AC-227	Not Detected	--------	2.70
TH-227	Not Detected	--------	5.92E-01
RA-223	Not Detected	--------	2.45E-01
RN-219	Not Detected	--------	4.73E-01
PB-211	Not Detected	--------	1.12
TL-207	Not Detected	--------	2.23E+01
AM-241	Not Detected	--------	3.12E-01
PU-239	Not Detected	--------	4.04E+02
NP-237	Not Detected	--------	2.85E-01
PA-233	Not Detected	--------	1.04E-01
TH-229	Not Detected	--------	3.84E-01

[Summary Report] - Sample ID: 50050106

044122-001
-002

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.94E-02
AR-41	Not Detected	--------	9.45E+04
BA-133	Not Detected	--------	1.03E-01
BA-140	Not Detected	--------	2.11E-01
CD-109	Not Detected	--------	9.81E-01
CD-115	Not Detected	--------	1.80E-01
CE-139	Not Detected	--------	4.99E-02
CE-141	Not Detected	--------	8.39E-02
CE-144	Not Detected	--------	3.68E-01
CO-56	Not Detected	--------	6.15E-02
CO-57	Not Detected	--------	4.42E-02
CO-58	Not Detected	--------	5.09E-02
CO-60	Not Detected	--------	5.53E-02
CR-51	Not Detected	--------	4.23E-01
CS-134	Not Detected	--------	8.16E-02
CS-137	3.72E-01	6.92E-02	5.20E-02
CU-64	Not Detected	--------	8.98E+01
EU-152	Not Detected	--------	4.27E-01
EU-154	Not Detected	--------	3.08E-01
EU-155	Not Detected	--------	1.92E-01
FE-59	Not Detected	--------	1.12E-01
GD-153	Not Detected	--------	1.60E-01
HG-203	Not Detected	--------	5.12E-02
I-131	Not Detected	--------	5.26E-02
IN-115m	Not Detected	--------	3.54E+01
IR-192	Not Detected	--------	4.94E-02
K-40	1.72E+01	2.51	5.37E-01
LA-140	Not Detected	--------	1.01E-01
MN-54	Not Detected	--------	5.51E-02
MN-56	Not Detected	--------	1.35E+03
MO-99	Not Detected	--------	5.84E-01
NA-22	Not Detected	--------	6.54E-02
NA-24	Not Detected	--------	3.34E-01
NB-95	Not Detected	--------	3.70E-01
ND-147	Not Detected	--------	3.73E-01
NI-57	Not Detected	--------	1.70E-01
BE-7	Not Detected	--------	4.22E-01
RU-103	Not Detected	--------	4.59E-02
RU-106	Not Detected	--------	5.00E-01
SB-122	Not Detected	--------	1.04E-01
SB-124	Not Detected	--------	5.57E-02
SB-125	Not Detected	--------	1.38E-01
SC-46	Not Detected	--------	8.12E-02
SR-85	Not Detected	--------	5.99E-02
TA-182	Not Detected	--------	2.37E-01
TA-183	Not Detected	--------	3.29E-01
TE-132	Not Detected	--------	6.26E-02
TL-201	Not Detected	--------	2.15E-01
XE-133	Not Detected	--------	2.85E-01
Y-88	Not Detected	--------	3.58E-02
ZN-65	Not Detected	--------	1.59E-01
ZR-95	Not Detected	--------	9.13E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 3:20:50 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Sample No. 044125-001 -002

stomer : M.YOUNG/E.RANKIN (7585/SMO)
stomer Sample ID : 024830-1
.b Sample ID : 50050107

mple Description : MARINELLI SOIL SAMPLE
mple Type : Solid
mple Geometry : 1SMAR
mple Quantity : 879.000 gram
mple Date/Time : 6-28-95 1:10:00 PM
quire Start Date : 6-30-95 2:46:41 AM
tector Name : LAB01
apsed Live Time : 1800 seconds
apsed Real Time : 1801 seconds

mments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.14
TH-234	Not Detected	--------	4.91E-01
U-234	Not Detected	--------	1.72E+01
RA-226	8.14E-01	5.87E-01	9.07E-01
PB-214	5.03E-01	1.03E-01	9.38E-02
BI-214	5.08E-01	1.06E-01	9.89E-02
PB-210	Not Detected	--------	4.98E+01
TH-232	6.00E-01	2.05E-01	2.56E-01
RA-228	6.36E-01	2.05E-01	2.33E-01
AC-228	7.14E-01	1.64E-01	1.33E-01
TH-228	6.53E-01	3.17E-01	6.68E-01
RA-224	1.67	4.33E-01	6.25E-01
PB-212	7.53E-01	1.65E-01	5.70E-02
BI-212	7.13E-01	3.60E-01	4.98E-01
TL-208	6.05E-01	1.39E-01	1.37E-01
U-235	Not Detected	--------	3.23E-01
TH-231	Not Detected	--------	6.42E-01
PA-231	Not Detected	--------	1.94
AC-227	Not Detected	--------	2.52
TH-227	Not Detected	--------	5.31E-01
RA-223	Not Detected	--------	2.24E-01
RN-219	Not Detected	--------	4.33E-01
PB-211	Not Detected	--------	9.81E-01
TL-207	Not Detected	--------	1.93E+01
AM-241	Not Detected	--------	2.80E-01
PU-239	Not Detected	--------	3.62E+02
NP-237	Not Detected	--------	2.72E-01
PA-233	Not Detected	--------	9.17E-02
TH-229	Not Detected	--------	3.31E-01

[Summary Report] - Sample ID: 50050107

044125-001
-002

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.84E-02
AR-41	Not Detected	--------	1.02E+05
BA-133	Not Detected	--------	8.67E-02
BA-140	Not Detected	--------	1.76E-01
CD-109	Not Detected	--------	9.37E-01
CD-115	Not Detected	--------	1.56E-01
CE-139	Not Detected	--------	4.66E-02
CE-141	Not Detected	--------	7.64E-02
CE-144	Not Detected	--------	3.11E-01
CO-56	Not Detected	--------	5.21E-02
CO-57	Not Detected	--------	4.20E-02
CO-58	Not Detected	--------	4.83E-02
CO-60	Not Detected	--------	5.53E-02
CR-51	Not Detected	--------	3.68E-01
CS-134	Not Detected	--------	7.29E-02
CS-137	4.29E-01	7.32E-02	4.50E-02
CU-64	Not Detected	--------	8.70E+01
EU-152	Not Detected	--------	3.71E-01
EU-154	Not Detected	--------	2.63E-01
EU-155	Not Detected	--------	1.69E-01
FE-59	Not Detected	--------	1.07E-01
GD-153	Not Detected	--------	1.37E-01
HG-203	Not Detected	--------	4.64E-02
I-131	Not Detected	--------	4.96E-02
IN-115m	Not Detected	--------	3.35E+01
IR-192	Not Detected	--------	4.44E-02
K-40	1.68E+01	2.41	3.82E-01
LA-140	Not Detected	--------	1.03E-01
MN-54	Not Detected	--------	5.02E-02
MN-56	Not Detected	--------	1.36E+03
MO-99	Not Detected	--------	5.28E-01
NA-22	Not Detected	--------	5.93E-02
NA-24	Not Detected	--------	2.88E-01
NB-95	Not Detected	--------	3.34E-01
ND-147	Not Detected	--------	3.27E-01
NI-57	Not Detected	--------	1.51E-01
BE-7	Not Detected	--------	3.97E-01
RU-103	Not Detected	--------	4.23E-02
RU-106	Not Detected	--------	4.10E-01
SB-122	Not Detected	--------	9.93E-02
SB-124	Not Detected	--------	5.25E-02
SB-125	Not Detected	--------	1.31E-01
SC-46	Not Detected	--------	7.37E-02
SR-85	Not Detected	--------	5.50E-02
TA-182	Not Detected	--------	2.16E-01
TA-183	Not Detected	--------	2.97E-01
TE-132	Not Detected	--------	5.70E-02
TL-201	Not Detected	--------	1.94E-01
XE-133	Not Detected	--------	2.59E-01
Y-88	Not Detected	--------	3.79E-02
ZN-65	Not Detected	--------	1.46E-01
ZR-95	Not Detected	--------	8.46E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 9:59:28 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

ıstomer : M.YOUNG/E.RANKIN (7585/SMO)
ıstomer Sample ID : 024831-1
ab Sample ID : 50050108

Sample No.
044124-001
-002

{044195-001
-002
Duplicate

ample Description : MARINELLI SOIL SAMPLE
ample Type : Solid
ample Geometry : 1SMAR
ample Quantity : 672.000 gram
ample Date/Time : 6-28-95 1:13:00 PM
cquire Start Date : 6-30-95 9:26:48 AM
etector Name : LAB01
Lapsed Live Time : 1800 seconds
Lapsed Real Time : 1801 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.55
TH-234	1.32	5.29E-01	6.62E-01
U-234	Not Detected	--------	2.23E+01
RA-226	1.69	8.34E-01	1.22
PB-214	7.11E-01	1.40E-01	1.19E-01
BI-214	5.89E-01	1.16E-01	8.97E-02
PB-210	Not Detected	--------	6.09E+01
TH-232	6.87E-01	2.21E-01	2.56E-01
RA-228	4.80E-01	2.28E-01	3.10E-01
AC-228	8.53E-01	2.07E-01	1.82E-01
TH-228	Not Detected	--------	1.77
RA-224	Not Detected	--------	7.88E-01
PB-212	8.80E-01	1.67E-01	7.42E-02
BI-212	1.31	5.47E-01	7.23E-01
TL-208	7.66E-01	1.68E-01	1.49E-01
U-235	Not Detected	--------	3.97E-01
TH-231	~~2.56E-01~~	~~1.85E-01~~	4.38E-01 Not detected 7/3/95
PA-231	Not Detected	--------	2.45
AC-227	Not Detected	--------	3.00
TH-227	Not Detected	--------	6.66E-01
RA-223	Not Detected	--------	2.72E-01
RN-219	Not Detected	--------	4.71E-01
PB-211	Not Detected	--------	1.26
TL-207	Not Detected	--------	2.53E+01
AM-241	Not Detected	--------	3.33E-01
PU-239	Not Detected	--------	4.47E+02
NP-237	Not Detected	--------	2.93E-01
PA-233	Not Detected	--------	1.13E-01
TH-229	Not Detected	--------	4.15E-01

[Summary Report] - Sample ID: 50050108

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.09E-01
AR-41	Not Detected	--------	1.63E+06
BA-133	Not Detected	--------	1.14E-01
BA-140	Not Detected	--------	2.10E-01
CD-109	Not Detected	--------	1.01
CD-115	Not Detected	--------	2.19E-01
CE-139	Not Detected	--------	5.63E-02
CE-141	Not Detected	--------	9.34E-02
CE-144	Not Detected	--------	3.95E-01
CO-56	Not Detected	--------	6.27E-02
CO-57	Not Detected	--------	4.88E-02
CO-58	Not Detected	--------	5.65E-02
CO-60	Not Detected	--------	6.25E-02
CR-51	Not Detected	--------	4.68E-01
CS-134	Not Detected	--------	9.16E-02
CS-137	4.65E-01	8.27E-02	5.38E-02
CU-64	Not Detected	--------	1.61E+02
EU-152	Not Detected	--------	4.51E-01
EU-154	Not Detected	--------	3.30E-01
EU-155	Not Detected	--------	2.08E-01
FE-59	Not Detected	--------	1.34E-01
GD-153	Not Detected	--------	1.78E-01
HG-203	Not Detected	--------	5.75E-02
I-131	Not Detected	--------	6.17E-02
IN-115m	Not Detected	--------	1.20E+02
IR-192	Not Detected	--------	5.58E-02
K-40	1.75E+01	2.57	5.08E-01
LA-140	Not Detected	--------	1.44E-01
MN-54	Not Detected	--------	6.32E-02
MN-56	Not Detected	--------	9.69E+03
MO-99	Not Detected	--------	6.78E-01
NA-22	Not Detected	--------	6.78E-02
NA-24	Not Detected	--------	4.91E-01
NB-95	Not Detected	--------	4.41E-01
ND-147	Not Detected	--------	4.04E-01
NI-57	Not Detected	--------	2.22E-01
BE-7	Not Detected	--------	4.93E-01
RU-103	Not Detected	--------	5.20E-02
RU-106	Not Detected	--------	5.45E-01
SB-122	Not Detected	--------	1.22E-01
SB-124	Not Detected	--------	6.31E-02
SB-125	Not Detected	--------	1.65E-01
SC-46	Not Detected	--------	9.24E-02
SR-85	Not Detected	--------	6.89E-02
TA-182	Not Detected	--------	2.74E-01
TA-183	Not Detected	--------	3.66E-01
TE-132	Not Detected	--------	7.61E-02
TL-201	Not Detected	--------	2.48E-01
XE-133	Not Detected	--------	3.44E-01
Y-88	Not Detected	--------	4.63E-02
ZN-65	Not Detected	--------	1.79E-01
ZR-95	Not Detected	--------	9.92E-02

044124-001
-002

044125-001
-002
Duplicate

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 6-30-95 10:42:09 AM *
****
*
* Analyzed by: 7/3/95 Reviewed by: 7/3/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024832-1
Lab Sample ID : 50050109

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 1SMAR
Sample Quantity : 741.000 gram
Sample Date/Time : 6-28-95 1:15:00 PM
Acquire Start Date : 6-30-95 10:04:11 AM
Detector Name : LAB01
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.26
TH-234	9.65E-01	4.29E-01	6.03E-01
U-234	Not Detected	--------	1.98E+01
RA-226	1.04	6.37E-01	9.60E-01
PB-214	5.92E-01	1.22E-01	1.11E-01
BI-214	5.00E-01	1.14E-01	1.15E-01
PB-210	Not Detected	--------	5.37E+01
TH-232	6.35E-01	2.89E-01	4.09E-01
RA-228	5.82E-01	2.34E-01	3.01E-01
AC-228	7.04E-01	1.80E-01	1.71E-01
TH-228	Not Detected	--------	1.65
RA-224	1.68	4.34E-01	6.75E-01
PB-212	7.70E-01	1.47E-01	6.78E-02
BI-212	6.72E-01	4.15E-01	6.05E-01
TL-208	6.84E-01	1.51E-01	1.34E-01
U-235	Not Detected	--------	3.48E-01
TH-231	Not Detected	--------	7.09E-01
PA-231	Not Detected	--------	2.29
AC-227	Not Detected	--------	2.78
TH-227	Not Detected	--------	6.01E-01
RA-223	Not Detected	--------	2.52E-01
RN-219	Not Detected	--------	4.38E-01
PB-211	Not Detected	--------	1.10
TL-207	Not Detected	--------	2.25E+01
AM-241	Not Detected	--------	2.95E-01
PU-239	Not Detected	--------	4.02E+02
NP-237	Not Detected	--------	4.56E-01
PA-233	Not Detected	--------	1.01E-01
TH-229	Not Detected	--------	3.70E-01

[Summary Report] - Sample ID: 50050109

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	8.17E-02
AR-41	Not Detected	--------	1.84E+06
BA-133	Not Detected	--------	1.05E-01
BA-140	Not Detected	--------	1.98E-01
CD-109	Not Detected	--------	1.03
CD-115	Not Detected	--------	2.00E-01
CE-139	Not Detected	--------	5.16E-02
CE-141	Not Detected	--------	8.07E-02
CE-144	Not Detected	--------	3.65E-01
CO-56	Not Detected	--------	5.80E-02
CO-57	Not Detected	--------	4.46E-02
CO-58	Not Detected	--------	5.28E-02
CO-60	Not Detected	--------	6.52E-02
CR-51	Not Detected	--------	4.01E-01
CS-134	Not Detected	--------	8.00E-02
CS-137	2.60E-01	5.68E-02	5.21E-02
CU-64	Not Detected	--------	1.50E+02
EU-152	Not Detected	--------	4.29E-01
EU-154	Not Detected	--------	2.98E-01
EU-155	Not Detected	--------	1.91E-01
FE-59	Not Detected	--------	1.20E-01
GD-153	Not Detected	--------	1.56E-01
HG-203	Not Detected	--------	4.95E-02
I-131	Not Detected	--------	6.13E-02
IN-115m	Not Detected	--------	1.19E+02
IR-192	Not Detected	--------	4.83E-02
K-40	1.85E+01	2.68	4.59E-01
LA-140	Not Detected	--------	1.42E-01
MN-54	Not Detected	--------	6.02E-02
MN-56	Not Detected	--------	1.05E+04
MO-99	Not Detected	--------	6.38E-01
NA-22	Not Detected	--------	6.92E-02
NA-24	Not Detected	--------	4.04E-01
NB-95	Not Detected	--------	4.00E-01
ND-147	Not Detected	--------	3.97E-01
NI-57	Not Detected	--------	1.67E-01
BE-7	Not Detected	--------	4.35E-01
RU-103	Not Detected	--------	4.85E-02
RU-106	Not Detected	--------	4.96E-01
SB-122	Not Detected	--------	1.09E-01
SB-124	Not Detected	--------	5.66E-02
SB-125	Not Detected	--------	1.48E-01
SC-46	Not Detected	--------	8.10E-02
SR-85	Not Detected	--------	6.26E-02
TA-182	Not Detected	--------	2.39E-01
TA-183	Not Detected	--------	3.26E-01
TE-132	Not Detected	--------	7.15E-02
TL-201	Not Detected	--------	2.29E-01
XE-133	Not Detected	--------	3.13E-01
Y-88	Not Detected	--------	4.80E-02
ZN-65	Not Detected	--------	1.53E-01
ZR-95	Not Detected	--------	1.01E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 11:25:05 AM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

Sample NO:
04-1126-001
-002

istomer : M.YOUNG/E.RANKIN (7585/SMO)
istomer Sample ID : 024833-1
ab Sample ID : 50050110

ample Description : MARINELLI SOIL SAMPLE
ample Type : Solid
ample Geometry : 1SMAR
ample Quantity : 777.000 gram
ample Date/Time : 6-28-95 1:18:00 PM
cquire Start Date : 6-30-95 10:52:30 AM
etector Name : LAB01
apsed Live Time : 1800 seconds
apsed Real Time : 1801 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.34
TH-234	Not Detected	--------	7.96E-01
U-234	Not Detected	--------	1.99E+01
RA-226	1.77	6.51E-01	8.73E-01
PB-214	6.00E-01	1.27E-01	1.24E-01
BI-214	5.68E-01	1.13E-01	9.42E-02
PB-210	Not Detected	--------	5.25E+01
TH-232	8.26E-01	2.59E-01	3.10E-01
RA-228	8.70E-01	5.11E-01	2.26E-01
AC-228	9.78E-01	2.08E-01	1.49E-01
TH-228	4.52E-01	2.92E-01	7.81E-01
RA-224	1.95	5.15E-01	6.63E-01
PB-212	8.30E-01	1.67E-01	6.61E-02
BI-212	9.69E-01	4.28E-01	5.70E-01
TL-208	6.72E-01	1.46E-01	1.26E-01
U-235	Not Detected	--------	3.70E-01
TH-231	Not Detected	--------	7.07E-01
PA-231	Not Detected	--------	2.07
AC-227	Not Detected	--------	2.68
TH-227	Not Detected	--------	5.93E-01
RA-223	Not Detected	--------	2.52E-01
RN-219	Not Detected	--------	4.78E-01
PB-211	Not Detected	--------	1.12
TL-207	Not Detected	--------	2.30E+01
AM-241	Not Detected	--------	3.10E-01
PU-239	Not Detected	--------	4.03E+02
NP-237	Not Detected	--------	4.50E-01
PA-233	Not Detected	--------	9.98E-02
TH-229	Not Detected	--------	3.72E-01

[Summary Report] - Sample ID: 50050110

044126-001
-002

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.15E-02
AR-41	Not Detected	--------	2.21E+06
BA-133	Not Detected	--------	1.01E-01
BA-140	Not Detected	--------	1.90E-01
CD-109	Not Detected	--------	1.48
CD-115	Not Detected	--------	1.96E-01
CE-139	Not Detected	--------	5.01E-02
CE-141	Not Detected	--------	8.71E-02
CE-144	Not Detected	--------	3.62E-01
CO-56	Not Detected	--------	5.62E-02
CO-57	Not Detected	--------	4.39E-02
CO-58	Not Detected	--------	5.06E-02
CO-60	Not Detected	--------	5.74E-02
CR-51	Not Detected	--------	4.13E-01
CS-134	Not Detected	--------	8.37E-02
CS-137	1.40E-01	4.21E-02	4.96E-02
CU-64	Not Detected	--------	1.50E+02
EU-152	Not Detected	--------	4.05E-01
EU-154	Not Detected	--------	3.12E-01
EU-155	Not Detected	--------	1.87E-01
FE-59	Not Detected	--------	1.18E-01
GD-153	Not Detected	--------	1.55E-01
HG-203	Not Detected	--------	5.03E-02
I-131	Not Detected	--------	5.49E-02
IN-115m	Not Detected	--------	1.30E+02
IR-192	Not Detected	--------	4.74E-02
K-40	1.72E+01	2.52	6.92E-01
LA-140	Not Detected	--------	1.23E-01
MN-54	Not Detected	--------	5.91E-02
MN-56	Not Detected	--------	1.25E+04
MO-99	Not Detected	--------	6.76E-01
NA-22	Not Detected	--------	7.17E-02
NA-24	Not Detected	--------	4.42E-01
NB-95	Not Detected	--------	3.97E-01
ND-147	Not Detected	--------	3.58E-01
NI-57	Not Detected	--------	1.78E-01
BE-7	Not Detected	--------	4.36E-01
RU-103	Not Detected	--------	4.85E-02
RU-106	Not Detected	--------	4.61E-01
SB-122	Not Detected	--------	1.10E-01
SB-124	Not Detected	--------	6.02E-02
SB-125	Not Detected	--------	1.39E-01
SC-46	Not Detected	--------	8.41E-02
SR-85	Not Detected	--------	6.09E-02
TA-182	Not Detected	--------	2.55E-01
TA-183	Not Detected	--------	3.44E-01
TE-132	Not Detected	--------	6.83E-02
TL-201	Not Detected	--------	2.35E-01
XE-133	Not Detected	--------	3.15E-01
Y-88	Not Detected	--------	4.49E-02
ZN-65	Not Detected	--------	1.66E-01
ZR-95	Not Detected	--------	8.91E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 12:09:10 PM

Analyzed by: 7/3/95 Reviewed by: 7/7/95

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 024834-1
ab Sample ID : 50050111

Sample No.
044127-001
-002

ample Description : MARINELLI SOIL SAMPLE
ample Type : Solid
ample Geometry : 1SMAR
ample Quantity : 795.000 gram
ample Date/Time : 6-28-95 1:20:00 PM
cquire Start Date : 6-30-95 11:35:16 AM
etector Name : LAB01
lapsed Live Time : 1800 seconds
lapsed Real Time : 1801 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.42
TH-234	Not Detected	--------	9.74E-01
U-234	Not Detected	--------	1.91E+01
RA-226	1.53	8.97E-01	1.36
PB-214	5.80E-01	1.12E-01	8.88E-02
BI-214	5.51E-01	1.10E-01	9.22E-02
PB-210	Not Detected	--------	5.29E+01
TH-232	8.18E-01	2.83E-01	3.63E-01
RA-228	7.33E-01	2.50E-01	2.08E-01
AC-228	Not Detected	--------	3.31E-01
TH-228	6.86E-01	3.43E-01	7.95E-01
RA-224	1.13E+01	1.92	1.43
PB-212	1.03	1.86E-01	1.30E-01
BI-212	9.85E-01	4.33E-01	5.78E-01
TL-208	7.68E-01	1.67E-01	1.56E-01
U-235	Not Detected	--------	3.37E-01
TH-231	Not Detected	--------	6.89E-01
PA-231	Not Detected	--------	2.19
AC-227	Not Detected	--------	2.67
TH-227	Not Detected	--------	5.90E-01
RA-223	Not Detected	--------	2.47E-01
RN-219	Not Detected	--------	4.45E-01
PB-211	Not Detected	--------	1.06
TL-207	Not Detected	--------	2.32E+01
AM-241	Not Detected	--------	3.14E-01
PU-239	Not Detected	--------	3.94E+02
NP-237	Not Detected	--------	4.42E-01
PA-233	Not Detected	--------	9.60E-02
TH-229	Not Detected	--------	3.64E-01

044127-001
-002

[Summary Report] - Sample ID: 50050111

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	5.83E-02
AR-41	Not Detected	--------	3.09E+06
BA-133	Not Detected	--------	9.63E-02
BA-140	Not Detected	--------	1.95E-01
CD-109	Not Detected	--------	9.04E-01
CD-115	Not Detected	--------	1.95E-01
CE-139	Not Detected	--------	4.98E-02
CE-141	Not Detected	--------	7.90E-02
CE-144	Not Detected	--------	3.50E-01
CO-56	Not Detected	--------	5.53E-02
CO-57	Not Detected	--------	4.50E-02
CO-58	Not Detected	--------	5.24E-02
CO-60	Not Detected	--------	5.36E-02
CR-51	Not Detected	--------	3.91E-01
CS-134	Not Detected	--------	7.76E-02
CS-137	4.89E-02	3.07E-02	4.54E-02
CU-64	Not Detected	--------	1.56E+02
EU-152	Not Detected	--------	4.11E-01
EU-154	Not Detected	--------	2.80E-01
EU-155	Not Detected	--------	1.84E-01
FE-59	Not Detected	--------	1.15E-01
GD-153	Not Detected	--------	1.54E-01
HG-203	Not Detected	--------	4.92E-02
I-131	Not Detected	--------	5.36E-02
IN-115m	Not Detected	--------	1.42E+02
IR-192	Not Detected	--------	4.62E-02
K-40	1.62E+01	2.36	4.95E-01
LA-140	Not Detected	--------	1.21E-01
MN-54	Not Detected	--------	5.64E-02
MN-56	Not Detected	--------	1.47E+04
MO-99	Not Detected	--------	6.20E-01
NA-22	Not Detected	--------	6.80E-02
NA-24	Not Detected	--------	4.94E-01
NB-95	Not Detected	--------	3.97E-01
ND-147	Not Detected	--------	3.60E-01
NI-57	Not Detected	--------	1.84E-01
BE-7	Not Detected	--------	3.98E-01
RU-103	Not Detected	--------	4.67E-02
RU-106	Not Detected	--------	4.78E-01
SB-122	Not Detected	--------	1.09E-01
SB-124	Not Detected	--------	5.19E-02
SB-125	Not Detected	--------	1.41E-01
SC-46	Not Detected	--------	8.10E-02
SR-85	Not Detected	--------	6.00E-02
TA-182	Not Detected	--------	2.37E-01
TA-183	Not Detected	--------	3.50E-01
TE-132	Not Detected	--------	6.85E-02
TL-201	Not Detected	--------	2.37E-01
XE-133	Not Detected	--------	3.15E-01
Y-88	Not Detected	--------	4.29E-02
ZN-65	Not Detected	--------	1.58E-01
ZR-95	Not Detected	--------	9.10E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 12:56:07 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 024835-1
ab Sample ID : 50050112

Sample No.
044128-001
-002

ample Description : MARINELLI SOIL SAMPLE
ample Type : Solid
ample Geometry : 1SMAR
ample Quantity : 761.000 gram
ample Date/Time : 6-28-95 1:40:00 PM
cquire Start Date : 6-30-95 12:16:26 PM
etector Name : LAB01
lapsed Live Time : 1800 seconds
lapsed Real Time : 1802 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.59
TH-234	Not Detected	--------	8.81E-01
U-234	Not Detected	--------	3.01E+01
RA-226	1.10	7.00E-01	1.06
PB-214	7.74E-01	1.51E-01	1.34E-01
BI-214	6.03E-01	1.34E-01	1.39E-01
PB-210	Not Detected	--------	7.92E+01
TH-232	3.76	8.08E-01	7.51E-01
RA-228	4.05	8.98E-01	3.10E-01
AC-228	4.50	7.72E-01	1.71E-01
TH-228	3.47	9.68E-01	1.14
RA-224	4.73	9.17E-01	1.05
PB-212	4.49	7.07E-01	9.80E-02
BI-212	4.71	1.03	9.76E-01
TL-208	3.77	5.69E-01	2.09E-01
U-235	Not Detected	--------	5.51E-01
TH-231	~~9.42E-01~~	~~3.42E-01~~	7.18E-01 not detected 7/3/95
PA-231	Not Detected	--------	3.03
AC-227	Not Detected	--------	4.16
TH-227	Not Detected	--------	1.24
RA-223	Not Detected	--------	4.10E-01
RN-219	Not Detected	--------	6.51E-01
PB-211	Not Detected	--------	1.76
TL-207	Not Detected	--------	3.11E+01
AM-241	Not Detected	--------	4.65E-01
PU-239	Not Detected	--------	6.35E+02
NP-237	Not Detected	--------	4.36E-01
PA-233	Not Detected	--------	1.56E-01
TH-229	Not Detected	--------	5.83E-01

044128-001
-002

[Summary Report] - Sample ID: 50050112

Nuclide	Activity (pCi/gram)	2S Error	MDA	
AG-110m	Not Detected	--------	9.70E-02	
AR-41	Not Detected	--------	4.22E+06	
BA-133	Not Detected	--------	1.28E-01	
BA-140	Not Detected	--------	3.04E-01	
CD-109	Not Detected	--------	1.50	
CD-115	Not Detected	--------	3.67E-01	
CE-139	Not Detected	--------	7.89E-02	
CE-141	Not Detected	--------	1.29E-01	
CE-144	Not Detected	--------	6.01E-01	
CO-56	Not Detected	--------	8.39E-02	
CO-57	Not Detected	--------	7.00E-02	
CO-58	Not Detected	--------	7.41E-02	
CO-60	Not Detected	--------	8.19E-02	
CR-51	Not Detected	--------	6.30E-01	
CS-134	Not Detected	--------	1.00E-01	
CS-137	2.18E-01	5.43E-02	5.84E-02	
CU-64	Not Detected	--------	2.14E+02	
EU-152	Not Detected	--------	6.04E-01	
EU-154	Not Detected	--------	5.28E-01	
EU-155	Not Detected	--------	3.05E-01	
FE-59	Not Detected	--------	1.44E-01	
GD-153	Not Detected	--------	2.52E-01	
HG-203	Not Detected	--------	7.69E-02	
I-131	Not Detected	--------	8.56E-02	
IN-115m	Not Detected	--------	2.82E+02	
IR-192	Not Detected	--------	7.25E-02	
K-40	1.87E+01	2.72	7.68E-01	
LA-140	Not Detected	--------	2.24E-01	
MN-54	~~3.82E-02~~	~~2.74E-02~~	4.21E-02	Not detected 7/7/11
MN-56	Not Detected	--------	2.45E+04	
MO-99	Not Detected	--------	1.00	
NA-22	Not Detected	--------	8.44E-02	
NA-24	Not Detected	--------	6.43E-01	
NB-95	Not Detected	--------	8.37E-01	
ND-147	Not Detected	--------	5.76E-01	
NI-57	Not Detected	--------	2.65E-01	
BE-7	Not Detected	--------	6.77E-01	
RU-103	Not Detected	--------	7.65E-02	
RU-106	Not Detected	--------	7.20E-01	
SB-122	~~6.86E-02~~	~~7.88E-02~~	1.26E-01	Not detected 7/7/11
SB-124	Not Detected	--------	8.20E-02	
SB-125	Not Detected	--------	2.08E-01	
SC-46	Not Detected	--------	9.79E-02	
SR-85	Not Detected	--------	1.03E-01	
TA-182	Not Detected	--------	2.85E-01	
TA-183	Not Detected	--------	5.18E-01	
TE-132	Not Detected	--------	1.09E-01	
TL-201	Not Detected	--------	3.89E-01	
XE-133	Not Detected	--------	5.37E-01	
Y-88	Not Detected	--------	6.71E-02	
ZN-65	Not Detected	--------	1.91E-01	
ZR-95	Not Detected	--------	1.55E-01	

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 6-30-95 1:39:02 PM *
****
*
* Analyzed by: 7/3/95 Reviewed by: 7/3/95 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 024836-1
Lab Sample ID : 50050113

Sample Description : MARINELLI SOIL SAMPLE
Sample Type : Solid
Sample Geometry : 1SMAR
Sample Quantity : 780.000 gram
Sample Date/Time : 6-28-95 1:42:00 PM
Acquire Start Date : 6-30-95 1:06:28 PM
Detector Name : LAB01
Elapsed Live Time : 1800 seconds
Elapsed Real Time : 1801 seconds

Comments:
****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.27
TH-234	1.14	4.61E-01	6.19E-01
U-234	Not Detected	--------	2.13E+01
RA-226	1.35	7.03E-01	1.04
PB-214	6.13E-01	1.27E-01	1.20E-01
BI-214	5.39E-01	1.48E-01	7.69E-02
PB-210	Not Detected	--------	5.27E+01
TH-232	7.84E-01	2.49E-01	3.00E-01
RA-228	5.68E-01	2.23E-01	2.84E-01
AC-228	7.43E-01	1.87E-01	1.79E-01
TH-228	1.06	4.20E-01	7.93E-01
RA-224	1.88	4.73E-01	6.58E-01
PB-212	8.58E-01	1.77E-01	6.44E-02
BI-212	1.12	4.52E-01	5.85E-01
TL-208	7.95E-01	1.63E-01	1.32E-01
U-235	Not Detected	--------	3.56E-01
TH-231	Not Detected	--------	7.00E-01
PA-231	Not Detected	--------	2.20
AC-227	Not Detected	--------	2.66
TH-227	Not Detected	--------	5.96E-01
RA-223	Not Detected	--------	2.50E-01
RN-219	Not Detected	--------	4.44E-01
PB-211	Not Detected	--------	1.03
TL-207	Not Detected	--------	2.34E+01
AM-241	Not Detected	--------	2.95E-01
PU-239	Not Detected	--------	3.92E+02
NP-237	Not Detected	--------	2.89E-01
PA-233	Not Detected	--------	9.57E-02
TH-229	Not Detected	--------	3.69E-01

[Summary Report] - Sample ID: 50050113

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	6.97E-02
AR-41	Not Detected	--------	4.35E+06
BA-133	Not Detected	--------	9.78E-02
BA-140	Not Detected	--------	1.98E-01
CD-109	Not Detected	--------	9.97E-01
CD-115	Not Detected	--------	2.01E-01
CE-139	Not Detected	--------	4.97E-02
CE-141	Not Detected	--------	8.24E-02
CE-144	Not Detected	--------	3.59E-01
CO-56	Not Detected	--------	5.88E-02
CO-57	Not Detected	--------	4.50E-02
CO-58	Not Detected	--------	5.35E-02
CO-60	Not Detected	--------	6.20E-02
CR-51	Not Detected	--------	3.97E-01
CS-134	Not Detected	--------	8.30E-02
CS-137	1.62E-01	4.55E-02	5.20E-02
CU-64	Not Detected	--------	1.53E+02
EU-152	Not Detected	--------	4.18E-01
EU-154	Not Detected	--------	3.03E-01
EU-155	Not Detected	--------	1.89E-01
FE-59	Not Detected	--------	1.09E-01
GD-153	Not Detected	--------	1.56E-01
HG-203	Not Detected	--------	3.22E-02
I-131	Not Detected	--------	5.50E-02
IN-115m	Not Detected	--------	1.73E+02
IR-192	Not Detected	--------	4.66E-02
K-40	1.73E+01	2.52	5.88E-01
LA-140	Not Detected	--------	1.31E-01
MN-54	Not Detected	--------	5.81E-02
MN-56	Not Detected	--------	2.13E+04
MO-99	Not Detected	--------	6.55E-01
NA-22	Not Detected	--------	6.51E-02
NA-24	Not Detected	--------	4.93E-01
NB-95	Not Detected	--------	4.05E-01
ND-147	Not Detected	--------	3.53E-01
NI-57	Not Detected	--------	1.91E-01
BE-7	Not Detected	--------	3.99E-01
RU-103	Not Detected	--------	4.85E-02
RU-106	Not Detected	--------	4.53E-01
SB-122	Not Detected	--------	1.15E-01
SB-124	Not Detected	--------	5.89E-02
SB-125	Not Detected	--------	1.39E-01
SC-46	Not Detected	--------	7.76E-02
SR-85	Not Detected	--------	6.03E-02
TA-182	Not Detected	--------	2.24E-01
TA-183	Not Detected	--------	3.31E-01
TE-132	Not Detected	--------	6.79E-02
TL-201	Not Detected	--------	2.34E-01
XE-133	Not Detected	--------	3.22E-01
Y-88	Not Detected	--------	4.28E-02
ZN-65	Not Detected	--------	1.57E-01
ZR-95	Not Detected	--------	1.01E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 2:17:20 PM

Analyzed by: 7/3/95 Reviewed by: 7/3/95

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 024837-1
ab Sample ID : 50050114

Sample No:
044129-001
-002

ample Description : MARINELLI SOIL SAMPLE
ample Type : Solid
ample Geometry : 1SMAR
ample Quantity : 859.000 gram
ample Date/Time : 6-28-95 1:45:00 PM
cquire Start Date : 6-30-95 1:44:00 PM
etector Name : LAB01
lapsed Live Time : 1800 seconds
lapsed Real Time : 1801 seconds

omments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.17
TH-234	Not Detected	--------	8.64E-01
U-234	Not Detected	--------	1.89E+01
RA-226	1.17	9.46E-01	1.49
PB-214	6.12E-01	9.73E-02	7.31E-02
BI-214	5.39E-01	1.08E-01	9.36E-02
PB-210	Not Detected	--------	5.03E+01
TH-232	7.93E-01	2.39E-01	2.78E-01
RA-228	8.41E-01	2.65E-01	1.90E-01
AC-228	8.46E-01	1.88E-01	1.53E-01
TH-228	Not Detected	--------	1.47
RA-224	1.54	3.93E-01	6.19E-01
PB-212	8.44E-01	1.55E-01	5.90E-02
BI-212	4.92E-01	3.10E-01	4.49E-01
TL-208	7.74E-01	1.59E-01	1.33E-01
U-235	Not Detected	--------	3.52E-01
TH-231	Not Detected	--------	6.71E-01
PA-231	Not Detected	--------	2.04
AC-227	Not Detected	--------	2.57
TH-227	Not Detected	--------	5.64E-01
RA-223	Not Detected	--------	2.41E-01
RN-219	Not Detected	--------	3.65E-01
PB-211	Not Detected	--------	1.06
TL-207	Not Detected	--------	2.07E+01
AM-241	Not Detected	--------	2.89E-01
PU-239	Not Detected	--------	3.88E+02
NP-237	Not Detected	--------	2.89E-01
PA-233	Not Detected	--------	9.22E-02
TH-229	Not Detected	--------	3.61E-01

Sample No. 0214129-001 -002

[Summary Report] - Sample ID: 50050114

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	7.23E-02
AR-41	Not Detected	--------	5.38E+06
BA-133	Not Detected	--------	9.29E-02
BA-140	Not Detected	--------	1.91E-01
CD-109	Not Detected	--------	9.96E-01
CD-115	Not Detected	--------	1.96E-01
CE-139	Not Detected	--------	4.70E-02
CE-141	Not Detected	--------	8.32E-02
CE-144	Not Detected	--------	3.38E-01
CO-56	Not Detected	--------	5.75E-02
CO-57	Not Detected	--------	4.32E-02
CO-58	Not Detected	--------	4.95E-02
CO-60	Not Detected	--------	5.23E-02
CR-51	Not Detected	--------	3.74E-01
CS-134	Not Detected	--------	7.69E-02
CS-137	1.95E-01	5.20E-02	6.02E-02
CU-64	Not Detected	--------	1.60E+02
EU-152	Not Detected	--------	3.98E-01
EU-154	Not Detected	--------	2.70E-01
EU-155	Not Detected	--------	1.86E-01
FE-59	Not Detected	--------	1.06E-01
GD-153	Not Detected	--------	1.51E-01
HG-203	Not Detected	--------	4.68E-02
I-131	Not Detected	--------	5.44E-02
IN-115m	Not Detected	--------	1.82E+02
IR-192	Not Detected	--------	4.35E-02
K-40	1.57E+01	2.29	5.26E-01
LA-140	Not Detected	--------	1.16E-01
MN-54	Not Detected	--------	5.52E-02
MN-56	Not Detected	--------	2.43E+04
MO-99	Not Detected	--------	6.25E-01
NA-22	Not Detected	--------	6.07E-02
NA-24	Not Detected	--------	4.57E-01
NB-95	Not Detected	--------	3.85E-01
ND-147	Not Detected	--------	3.64E-01
NI-57	Not Detected	--------	1.80E-01
BE-7	Not Detected	--------	4.14E-01
RU-103	Not Detected	--------	4.67E-02
RU-106	Not Detected	--------	4.52E-01
SB-122	Not Detected	--------	1.08E-01
SB-124	Not Detected	--------	5.57E-02
SB-125	Not Detected	--------	1.32E-01
SC-46	Not Detected	--------	7.71E-02
SR-85	Not Detected	--------	5.94E-02
TA-182	Not Detected	--------	2.25E-01
TA-183	Not Detected	--------	3.25E-01
TE-132	Not Detected	--------	6.74E-02
TL-201	Not Detected	--------	2.33E-01
XE-133	Not Detected	--------	3.13E-01
Y-88	Not Detected	--------	3.98E-02
ZN-65	Not Detected	--------	1.52E-01
ZR-95	Not Detected	--------	9.11E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 3:00:33 PM

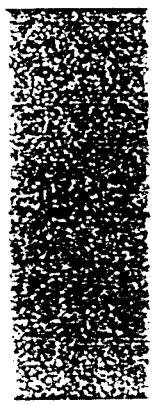
Analyzed by: 7/3/95 Reviewed by: 7/3/95

Sample No:
044130-001
-002

istomer : M.YOUNG/E.RANKIN (7585/SMO)
istomer Sample ID : 024838-1
ab Sample ID : 50050115

umple Description : MARINELLI SOIL SAMPLE
umple Type : Solid
umple Geometry : 1SMAR
umple Quantity : 724.000 gram
umple Date/Time : 6-28-95 1:48:00 PM
:quire Start Date : 6-30-95 2:22:10 PM
:tector Name : LAB01
.apsed Live Time : 1800 seconds
.apsed Real Time : 1801 seconds

)mments:



Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.54
TH-234	Not Detected	--------	5.88E-01
U-234	Not Detected	--------	2.20E+01
RA-226	1.83	8.06E-01	1.15
PB-214	6.97E-01	1.40E-01	1.26E-01
BI-214	6.77E-01	1.29E-01	1.02E-01
PB-210	Not Detected	--------	5.86E+01
TH-232	1.11	3.34E-01	3.97E-01
RA-228	8.03E-01	2.71E-01	3.26E-01
AC-228	9.24E-01	2.07E-01	1.61E-01
TH-228	8.17E-01	3.75E-01	7.84E-01
RA-224	2.12	5.36E-01	7.67E-01
PB-212	1.01	2.09E-01	7.33E-02
BI-212	9.73E-01	4.72E-01	6.52E-01
TL-208	7.56E-01	1.63E-01	1.42E-01
U-235	Not Detected	--------	3.93E-01
TH-231	Not Detected	--------	7.66E-01
PA-231	Not Detected	--------	2.40
AC-227	Not Detected	--------	3.02
TH-227	Not Detected	--------	6.61E-01
RA-223	Not Detected	--------	2.76E-01
RN-219	Not Detected	--------	4.94E-01
PB-211	Not Detected	--------	1.24
TL-207	Not Detected	--------	2.41E+01
AM-241	Not Detected	--------	3.24E-01
PU-239	Not Detected	--------	3.54E+02
NP-237	Not Detected	--------	4.97E-01
PA-233	Not Detected	--------	1.12E-01
TH-229	Not Detected	--------	4.07E-01

044 130-001
-002

[Summary Report] - Sample ID: 50050115

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	9.43E-02
AR-41	Not Detected	--------	8.01E+06
BA-133	Not Detected	--------	1.09E-01
BA-140	Not Detected	--------	2.11E-01
CD-109	Not Detected	--------	9.46E-01
CD-115	Not Detected	--------	2.27E-01
CE-139	Not Detected	--------	5.41E-02
CE-141	Not Detected	--------	9.12E-02
CE-144	Not Detected	--------	3.93E-01
CO-56	Not Detected	--------	6.43E-02
CO-57	Not Detected	--------	4.91E-02
CO-58	Not Detected	--------	5.35E-02
CO-60	Not Detected	--------	6.57E-02
CR-51	Not Detected	--------	4.62E-01
CS-134	Not Detected	--------	8.76E-02
CS-137	3.36E-01	6.96E-02	6.34E-02
CU-64	Not Detected	--------	2.03E+02
EU-152	Not Detected	--------	4.40E-01
EU-154	Not Detected	--------	3.19E-01
EU-155	Not Detected	--------	2.10E-01
FE-59	Not Detected	--------	1.35E-01
GD-153	Not Detected	--------	1.69E-01
HG-203	Not Detected	--------	3.11E-02
I-131	Not Detected	--------	6.15E-02
IN-115m	Not Detected	--------	2.30E+02
IR-192	Not Detected	--------	5.48E-02
K-40	1.91E+01	2.78	6.08E-01
LA-140	Not Detected	--------	1.41E-01
MN-54	Not Detected	--------	6.25E-02
MN-56	Not Detected	--------	3.18E+04
MO-99	Not Detected	--------	7.48E-01
NA-22	Not Detected	--------	7.56E-02
NA-24	Not Detected	--------	5.77E-01
NB-95	Not Detected	--------	4.54E-01
ND-147	Not Detected	--------	4.05E-01
NI-57	Not Detected	--------	2.16E-01
BE-7	Not Detected	--------	4.94E-01
RU-103	Not Detected	--------	5.37E-02
RU-106	Not Detected	--------	5.58E-01
SB-122	Not Detected	--------	1.21E-01
SB-124	Not Detected	--------	5.96E-02
SB-125	Not Detected	--------	1.50E-01
SC-46	Not Detected	--------	9.19E-02
SR-85	Not Detected	--------	6.70E-02
TA-182	Not Detected	--------	2.70E-01
TA-183	Not Detected	--------	3.65E-01
TE-132	Not Detected	--------	7.72E-02
TL-201	Not Detected	--------	2.63E-01
XE-133	Not Detected	--------	3.61E-01
Y-88	Not Detected	--------	4.82E-02
ZN-65	Not Detected	--------	1.80E-01
ZR-95	Not Detected	--------	1.05E-01

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 3:45:47 PM

lyzed by: 7/3/95 Reviewed by: 7/3/95

mer : M.YOUNG/E.RANKIN (7585/SMO)
mer Sample ID : 024839-1
ample ID : 50050116

Sample No.:
044131-001
-002

e Description : MARINELLI SOIL SAMPLE
e Type : Solid
e Geometry : 1SMAR
e Quantity : 748.000 gram
e Date/Time : 6-28-95 1:50:00 PM
re Start Date : 6-30-95 3:11:13 PM
tor Name : LAB01
ed Live Time : 1800 seconds
ed Real Time : 1802 seconds

nts:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.64
TH-234	2.83	9.01E-01	8.51E-01
U-234	Not Detected	--------	2.75E+01
RA-226	9.46E-01	6.20E-01	9.40E-01
PB-214	8.27E-01	1.89E-01	2.13E-01
BI-214	5.59E-01	1.20E-01	1.16E-01
PB-210	Not Detected	--------	7.55E+01
TH-232	2.67	6.12E-01	6.08E-01
RA-228	2.54	7.40E-01	2.88E-01
AC-228	3.14	5.27E-01	2.56E-01
TH-228	2.64	1.12	1.17
RA-224	Not Detected	--------	3.14
PB-212	3.59	5.67E-01	1.96E-01
BI-212	3.12	8.36E-01	9.43E-01
TL-208	2.55	4.06E-01	1.95E-01
U-235	Not Detected	--------	5.03E-01
TH-231	~~7.85E-01~~	~~3.08E-01~~	6.85E-01 not detected JC 7/3/95
PA-231	Not Detected	--------	2.76
AC-227	Not Detected	--------	3.79
TH-227	Not Detected	--------	1.07
RA-223	Not Detected	--------	3.98E-01
RN-219	Not Detected	--------	6.48E-01
PB-211	Not Detected	--------	1.65
TL-207	Not Detected	--------	2.90E+01
AM-241	Not Detected	--------	4.79E-01
PU-239	Not Detected	--------	5.58E+02
NP-237	Not Detected	--------	3.98E-01
PA-233	Not Detected	--------	1.36E-01
TH-229	Not Detected	--------	5.31E-01

044131-001
-002

umary Report] - Sample ID: 50050116

ıclide	Activity (pCi/gram)	2S Error	MDA
}-110m	Not Detected	--------	1.52E-01
ł-41	Not Detected	--------	1.24E+07
ł-133	Not Detected	--------	1.21E-01
ł-140	Not Detected	--------	2.88E-01
)-109	Not Detected	--------	1.37
)-115	Not Detected	--------	3.31E-01
ł-139	Not Detected	--------	7.16E-02
ł-141	Not Detected	--------	1.19E-01
ł-144	Not Detected	--------	5.37E-01
)-56	Not Detected	--------	7.16E-02
)-57	Not Detected	--------	6.57E-02
)-58	Not Detected	--------	6.65E-02
)-60	Not Detected	--------	7.30E-02
ł-51	Not Detected	--------	5.43E-01
}-134	Not Detected	--------	9.47E-02
}-137	1.06	1.59E-01	7.26E-02
J-64	Not Detected	--------	2.27E+02
J-152	Not Detected	--------	5.07E-01
J-154	Not Detected	--------	4.63E-01
J-155	Not Detected	--------	2.73E-01
ł-59	Not Detected	--------	1.33E-01
)-153	Not Detected	--------	2.34E-01
}-203	Not Detected	--------	7.18E-02
·131	Not Detected	--------	7.88E-02
I-115m	Not Detected	--------	3.74E+02
ł-192	Not Detected	--------	6.45E-02
·40	1.81E+01	2.63	5.36E-01
ł-140	Not Detected	--------	2.13E-01
I-54	Not Detected	--------	7.33E-02
I-56	Not Detected	--------	4.37E+04
)-99	Not Detected	--------	9.17E-01
ł-22	Not Detected	--------	7.64E-02
ł-24	Not Detected	--------	7.27E-01
}-95	Not Detected	--------	7.39E-01
)-147	Not Detected	--------	5.32E-01
ł-57	Not Detected	--------	2.50E-01
ł-7	Not Detected	--------	6.09E-01
J-103	Not Detected	--------	7.10E-02
J-106	Not Detected	--------	6.57E-01
}-122	Not Detected	--------	1.57E-01
}-124	Not Detected	--------	7.39E-02
}-125	Not Detected	--------	2.09E-01
ł-46	Not Detected	--------	9.19E-02
ł-85	Not Detected	--------	9.14E-02
ł-182	Not Detected	--------	2.70E-01
ł-183	Not Detected	--------	5.43E-01
ł-132	Not Detected	--------	1.00E-01
ł-201	Not Detected	--------	3.88E-01
ł-133	Not Detected	--------	5.50E-01
·88	Not Detected	--------	6.18E-02
N-65	Not Detected	--------	1.81E-01
ł-95	Not Detected	--------	1.34E-01

Sandia National Laboratories
adiation Protection Sample Diagnostics Program [881 Laboratory]
6-30-95 4:27:11 PM

yzed by: 7/3/95 Reviewed by: 7/3/95

er : M.YOUNG/E.RANKIN (7585/SMO)
er Sample ID : 024840-1
mple ID : 50050117

Sample No:
044123-001
-002

Description : MARINELLI SOIL SAMPLE
Type : Solid
Geometry : 1SMAR
Quantity : 734.000 gram
Date/Time : 6-28-95 1:53:00 PM
e Start Date : 6-30-95 3:52:32 PM
or Name : LAB01
d Live Time : 1800 seconds
d Real Time : 1803 seconds

ts:

uclide	Activity (pCi/gram)	2S Error	MDA
-238	2.65	3.35	5.39
H-234	Not Detected	--------	1.04
-234	Not Detected	--------	3.35E+01
A-226	1.46	1.39	2.21
B-214	7.49E-01	1.94E-01	2.39E-01
I-214	5.91E-01	1.42E-01	1.60E-01
B-210	Not Detected	--------	9.21E+01
H-232	5.37	9.76E-01	5.40E-01
A-228	5.47	9.89E-01	3.05E-01
C-228	5.57	9.61E-01	1.93E-01
H-228	4.57	1.23	1.27
A-224	Not Detected	--------	4.10
B-212	6.22	9.58E-01	2.32E-01
I-212	6.39	1.38	1.39
L-208	5.06	7.49E-01	2.49E-01
-235	Not Detected	--------	6.35E-01
H-231	~~2.10~~	~~5.75E-01~~	7.95E-01 Not detected 7/3/95
A-231	Not Detected	--------	3.39
C-227	Not Detected	--------	4.62
H-227	Not Detected	--------	1.40
A-223	Not Detected	--------	4.92E-01
N-219	Not Detected	--------	8.60E-01
B-211	Not Detected	--------	2.06
L-207	Not Detected	--------	3.37E+01
M-241	Not Detected	--------	5.58E-01
U-239	Not Detected	--------	9.93E+02
P-237	Not Detected	--------	5.00E-01
A-233	Not Detected	--------	1.71E-01
H-229	Not Detected	--------	5.18E-01

[redacted]

mary Report] - Sample ID: 50050117

044123-001
-002

iclide	Activity (pCi/gram)	2S Error	MDA	
-110m	Not Detected	--------	1.60E-01	
-41	Not Detected	--------	1.64E+07	
-133	Not Detected	--------	1.38E-01	
-140	Not Detected	--------	3.59E-01	
-109	Not Detected	--------	1.72	
-115	Not Detected	--------	4.49E-01	
-139	Not Detected	--------	8.89E-02	
-141	Not Detected	--------	1.49E-01	
-144	Not Detected	--------	6.76E-01	
-56	Not Detected	--------	9.08E-02	
-57	Not Detected	--------	7.85E-02	
-58	Not Detected	--------	8.37E-02	
-60	Not Detected	--------	8.25E-02	
-51	Not Detected	--------	6.93E-01	
-134	Not Detected	--------	1.09E-01	
-137	1.06	1.61E-01	7.95E-02	
-64	Not Detected	--------	2.61E+02	
-152	Not Detected	--------	6.87E-01	
-154	Not Detected	--------	6.20E-01	
-155	Not Detected	--------	3.40E-01	
-59	Not Detected	--------	1.58E-01	
-153	Not Detected	--------	2.81E-01	
-203	Not Detected	--------	6.62E-02	
-131	Not Detected	--------	1.00E-01	
-115m	Not Detected	--------	5.57E+02	
-192	Not Detected	--------	7.99E-02	
-40	1.81E+01	2.66	7.87E-01	
-140	Not Detected	--------	2.62E-01	
-54	~~9.36E-02~~	~~3.90E-02~~	5.06E-02	Not detected JF 2/3/11
-56	Not Detected	--------	6.58E+04	
-99	Not Detected	--------	1.16	
-22	Not Detected	--------	8.77E-02	
-24	Not Detected	--------	7.72E-01	
-95	Not Detected	--------	9.75E-01	
-147	Not Detected	--------	6.71E-01	
-57	Not Detected	--------	2.85E-01	
-7	~~3.82E-01~~	~~2.06E-01~~	4.36E-01	Not detected JF 2/7/11
-103	Not Detected	--------	8.85E-02	
-106	Not Detected	--------	8.10E-01	
-122	Not Detected	--------	2.06E-01	
-124	Not Detected	--------	8.94E-02	
-125	Not Detected	--------	2.43E-01	
-46	Not Detected	--------	9.93E-02	
-85	Not Detected	--------	1.22E-01	
-182	Not Detected	--------	2.88E-01	
-183	Not Detected	--------	6.34E-01	
-132	Not Detected	--------	1.29E-01	
-201	Not Detected	--------	4.93E-01	
-133	Not Detected	--------	6.73E-01	
-88	Not Detected	--------	8.49E-02	
-65	Not Detected	--------	2.03E-01	
-95	Not Detected	--------	1.76E-01	

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* Analyzed by: 7/3/95 Reviewed by: 7/3/95 *
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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
7-01-95 10:38:05 AM

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
Lab Sample ID : 50050118

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 7-01-95 10:25:28 AM
Detector Name : LAB01
Elapsed Live Time : 600 seconds
Elapsed Real Time : 608 seconds

Comments:
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Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.56E+04
TH-234	Not Detected	--------	3.89E+03
U-234	Not Detected	--------	1.14E+05
RA-226	Not Detected	--------	6.03E+03
PB-214	Not Detected	--------	7.16E+02
BI-214	Not Detected	--------	6.28E+02
PB-210	Not Detected	--------	1.27E+06
TH-232	Not Detected	--------	2.10E+03
RA-228	Not Detected	--------	2.69E+03
AC-228	Not Detected	--------	1.73E+03
TH-228	Not Detected	--------	3.75E+04
RA-224	Not Detected	--------	3.15E+04
PB-212	Not Detected	--------	2.86E+03
BI-212	Not Detected	--------	2.43E+04
TL-208	Not Detected	--------	5.06E+03
U-235	Not Detected	--------	1.61E+03
TH-231	Not Detected	--------	2.72E+03
PA-231	Not Detected	--------	9.65E+03
AC-227	Not Detected	--------	1.48E+04
TH-227	Not Detected	--------	2.37E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	2.91E+03
PB-211	Not Detected	--------	8.73E+03
TL-207	Not Detected	--------	2.15E+05
AM-241	1.14E+05	1.82E+04	2.62E+03
PU-239	Not Detected	--------	1.76E+06
NP-237	Not Detected	--------	1.80E+03
PA-233	Not Detected	--------	6.21E+02
TH-229	Not Detected	--------	1.59E+03

[Summary Report] - Sample ID: 50050118

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	--------	1.65E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.62E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.13E+05	7.00E+04	7.16E+04
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	1.27E+06
CE-141	Not Detected	--------	2.17E+18
CE-144	Not Detected	--------	1.00E+05
CO-56	Not Detected	--------	1.77E+09
CO-57	1.35E+04	7.49E+03	1.14E+04
CO-58	Not Detected	--------	6.31E+09
CO-60	7.38E+04	9.58E+03	5.60E+02
CR-51	Not Detected	--------	7.56E+21
CS-134	Not Detected	--------	1.44E+03
CS-137	6.83E+04	8.81E+03	4.92E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	3.41E+03
EU-154	Not Detected	--------	2.18E+03
EU-155	Not Detected	--------	1.60E+03
FE-59	Not Detected	--------	2.86E+14
GD-153	Not Detected	--------	7.92E+04
HG-203	Not Detected	--------	2.77E+13
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	2.52E+09
K-40	Not Detected	--------	1.68E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	1.67E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	8.13E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-7	Not Detected	--------	1.41E+13
RU-103	Not Detected	--------	3.95E+15
RU-106	Not Detected	--------	7.31E+04
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	9.79E+10
SB-125	Not Detected	--------	3.53E+03
SC-46	Not Detected	--------	5.69E+08
SR-85	Not Detected	--------	2.88E+10
TA-182	Not Detected	--------	3.59E+07
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	1.17E+07
ZN-65	Not Detected	--------	1.17E+05
ZR-95	Not Detected	--------	6.02E+10

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

Quality Assurance Report

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Report Date	:	7-01-95 10:46:45 AM
QA File	:	C:\GENIEPC\CAMFILES\LCS1.QAF
Analyst	:	FCD
Sample ID	:	50050118
Sample Quantity	:	1.00 Each
Sample Date	:	11-01-90 12:00:00 PM
Measurement Date	:	7-01-95 10:25:28 AM
Elapsed Live Time	:	600 seconds
Elapsed Real Time	:	608 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	1.127E-01	4.267E-03	1.145E-01	<	:	: Ac:	>
CS-137 Activity	6.834E-02	1.946E-03	6.831E-02	<	:	:	: >
CO-60 Activity	7.631E-02	2.929E-03	7.347E-02	<	:	:	: >

OK 7/3/95

Flags Key:
- LU = Boundary Test (Ab = Above , Be = Below)
- SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
- UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
- BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 7/3/95

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

AR/COC- 06578

Internal Lab Batch No. _____

SF 2001-COC (6-95)

Dept. No./Mail Stop: 6685 MS1148
Project/Task Manager: Mike Young
Project Name: Site 58 Borehole
Record Center Code: ER/1332/58/DAT
Logbook Ref No: #190
Service Order No.: CF0180

Date Samples Shipped: HC 4/11/97 SB
Carrier/Waybill No.: HC
FF Lab Contact: Fernando Dummyer
Lab Destination: RPSD Bldg 881
SMO Contact/Phone: Doug Salmi 848-0963
Send Report to SMO: Kathy Becker

Contract No.: N/A
Case No.: 3622.820
SMO Authorization:
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec.

Location Tech Area ER Site 58
Building N/A Room N/A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
√ 033178-002	558-BH5-025-050'-SA	50'	58	4-9-97 0940	S	M	500ml	None	G	SA	
√ 033151-002	558-BH2-010-050'-SA	50'	58	4-9-97 1345	↓	↓	↓	↓	↓	↓	
√ 033142-002	558-BH1-005-050'-SA	50'	58	4-10-97 0930							
√ 033160-002	558-BH3-015-050'-SA	50'	58	4-10-97 1255							

LAB USE

RMMA ~~Yes~~ NC No Not Required NC Ref. No. _____
Sample Disposal ☒ Return to Client ☐ Disposal by lab
Turnaround Time ☒ Normal ☐ Rush Required Report Date _____

Sample Tracking SMO USE
Date Entered (mm/dd/yy) _____
Entered by: _____
QC inits. _____

Special Instructions/QC Requirements
- Send as separate report.
- ~~C.O.C # releases~~ 06578 NC
- ~~release~~ COC # 06579 NC
- The Carton radioactive material label was put on samples for precautionary purposes.

Abnormal Conditions on Receipt LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Nelson Capistran		NC	IT/6684 284-3307
	Gilbert Quintana		GQ	IT/6684 284-3307

1. Relinquished by		Org. IT/6684	Date 4-11-97	Time 1110	4. Relinquished by	Org.	Date Time
1. Received by		Org. SMO 7578	Date 4/11/97	Time 1110	4. Received by	Org.	Date Time
2. Relinquished by		Org.	Date	Time	5. Relinquished by	Org.	Date Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-11-97 3:17:26 PM *
****
*
* Analyzed by: 4/12/97 Reviewed by: 4/14/97 *
****

Customer : M.YOUNG/MAC (6685/SMO)
Customer Sample ID : 033178-002
Lab Sample ID : 70054701

Sample Description : MARINELLI SOIL SAMPLE
Sample Quantity : 873.000 gram
Sample Date/Time : 4-09-97 9:40:00 AM
Acquire Start Date/Time : 4-11-97 1:34:07 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.04E+00
TH-234	7.34E-01	4.12E-01	6.92E-01
RA-226	1.41E+00	4.86E-01	5.02E-01
PB-214	6.41E-01	1.15E-01	4.27E-02
BI-214	5.68E-01	3.46E-01	2.05E-01
TH-232	6.68E-01	3.20E-01	1.33E-01
RA-228	7.68E-01	2.67E-01	1.35E-01
AC-228	7.13E-01	1.87E-01	8.05E-02
TH-228	6.70E-01	2.17E-01	4.11E-01
RA-224	2.72E-01	7.98E-02	2.24E-02
PB-212	6.58E-01	3.41E-01	3.62E-02
BI-212	4.87E-01	1.69E-01	1.54E-01
TL-208	2.40E-01	2.36E-01	2.12E-02
U-235	Not Detected	---	2.20E-01
TH-231	Not Detected	---	1.18E+01
PA-231	Not Detected	---	1.27E+00
TH-227	Not Detected	---	3.06E-01
RA-223	Not Detected	---	2.04E-01
RN-219	Not Detected	---	3.24E-01
PB-211	Not Detected	---	7.50E-01
TL-207	Not Detected	---	1.22E+01
AM-241	Not Detected	---	4.35E-01
PU-239	Not Detected	---	4.07E+02
NP-237	Not Detected	---	3.57E-01
PA-233	Not Detected	---	5.30E-02
TH-229	Not Detected	---	2.33E-01

[Summary Report] - Sample ID: : 70054701

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.79E-02	
AG-110m	Not Detected	---	2.62E-02	
BA-133	Not Detected	---	5.86E-02	
BE-7	Not Detected	---	2.28E-01	
CD-109	~~1.18E+00~~	~~4.91E-01~~	9.14E-01	not detected 4/12/97
CD-115	Not Detected	---	1.13E-01	
CE-139	Not Detected	---	2.72E-02	
CE-141	Not Detected	---	4.94E-02	
CE-144	Not Detected	---	2.23E-01	
CO-56	Not Detected	---	2.26E-02	
CO-57	Not Detected	---	2.80E-02	
CO-58	Not Detected	---	2.90E-02	
CO-60	Not Detected	---	3.07E-02	
CR-51	Not Detected	---	2.16E-01	
CS-134	Not Detected	---	4.27E-02	
CS-137	Not Detected	---	2.83E-02	
EU-152	Not Detected	---	8.40E-02	
EU-154	Not Detected	---	1.73E-01	
EU-155	Not Detected	---	1.38E-01	
FE-59	Not Detected	---	6.62E-02	
GD-153	Not Detected	---	9.91E-02	
HG-203	Not Detected	---	2.95E-02	
I-131	Not Detected	---	3.01E-02	
IR-192	Not Detected	---	2.50E-02	
K-40	1.93E+01	2.80E+00	2.24E-01	
MN-52	Not Detected	---	3.33E-02	
MN-54	Not Detected	---	3.13E-02	
MO-99	Not Detected	---	3.72E-01	
NA-22	Not Detected	---	3.96E-02	
NA-24	Not Detected	---	3.19E-01	
NB-95	Not Detected	---	2.13E-01	
ND-147	Not Detected	---	2.04E-01	
NI-57	~~1.03E-01~~	~~1.04E-01~~	5.27E-02	not detected 4/12/97
PB-210	Not Detected	---	3.08E+01	
RU-103	Not Detected	---	2.61E-02	
RU-106	Not Detected	---	2.65E-01	
SB-122	Not Detected	---	6.20E-02	
SB-124	Not Detected	---	2.74E-02	
SB-125	Not Detected	---	7.34E-02	
SN-113	Not Detected	---	3.38E-02	
SR-85	Not Detected	---	3.31E-02	
TA-182	Not Detected	---	1.37E-01	
TA-183	Not Detected	---	4.96E-01	
TC-99m	Not Detected	---	1.06E+01	
TL-201	Not Detected	---	2.72E-01	
XE-133	Not Detected	---	2.61E-01	
Y-88	Not Detected	---	2.33E-02	
ZN-65	Not Detected	---	9.27E-02	
ZR-95	Not Detected	---	5.21E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
4-11-97 5:02:28 PM

Analyzed by: 4/12/97 Reviewed by: 4/14/97

Customer : M.YOUNG/MAC (6685/SMO)
Customer Sample ID : 033151-002
Lab Sample ID : 70054702

Sample Description : MARINELLI SOIL SAMPLE
Sample Quantity : 743.000 gram
Sample Date/Time : 4-09-97 1:45:00 PM
Acquire Start Date/Time : 4-11-97 3:19:39 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	3.27E+00
TH-234	Not Detected	---------	7.67E-01
RA-226	2.07E+00	1.36E+00	5.59E-01
PB-214	7.95E-01	2.14E-01	4.65E-02
BI-214	6.84E-01	5.92E-01	2.40E-01
TH-232	6.86E-01	3.36E-01	1.46E-01
RA-228	5.15E-01	1.67E-01	1.35E-01
AC-228	6.16E-01	1.64E-01	6.77E-02
TH-228	6.23E-01	2.45E-01	4.91E-01
RA-224	5.71E-01	1.97E-01	9.12E-02
PB-212	6.32E-01	2.13E-01	3.74E-02
BI-212	3.45E-01	1.68E-01	1.60E-01
TL-208	5.73E-01	1.10E+00	6.02E-02
U-235	Not Detected	---------	2.45E-01
TH-231	Not Detected	---------	1.26E+01
PA-231	Not Detected	---------	1.39E+00
TH-227	Not Detected	---------	3.26E-01
RA-223	Not Detected	---------	2.20E-01
RN-219	Not Detected	---------	3.62E-01
PB-211	Not Detected	---------	8.25E-01
TL-207	Not Detected	---------	1.38E+01
AM-241	Not Detected	---------	4.63E-01
PU-239	Not Detected	---------	4.31E+02
NP-237	Not Detected	---------	3.79E-01
PA-233	Not Detected	---------	5.53E-02
TH-229	Not Detected	---------	2.48E-01

[Summary Report] - Sample ID: : 70054702

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.68E-02	
AG-110m	Not Detected	---	3.02E-02	
BA-133	Not Detected	---	6.85E-02	
BE-7	Not Detected	---	2.44E-01	
CD-109	~~1.22E+00~~	~~4.47E-01~~	8.24E-01	not detected J 4/12/97
CD-115	Not Detected	---	1.20E-01	
CE-139	Not Detected	---	2.93E-02	
CE-141	Not Detected	---	5.52E-02	
CE-144	Not Detected	---	2.39E-01	
CO-56	Not Detected	---	3.41E-02	
CO-57	Not Detected	---	3.00E-02	
CO-58	Not Detected	---	3.19E-02	
CO-60	Not Detected	---	3.33E-02	
CR-51	Not Detected	---	2.28E-01	
CS-134	Not Detected	---	5.03E-02	
CS-137	Not Detected	---	3.25E-02	
EU-152	Not Detected	---	9.01E-02	
EU-154	Not Detected	---	1.69E-01	
EU-155	Not Detected	---	1.45E-01	
FE-59	Not Detected	---	7.19E-02	
GD-153	Not Detected	---	1.03E-01	
HG-203	Not Detected	---	3.20E-02	
I-131	Not Detected	---	3.18E-02	
IR-192	Not Detected	---	2.65E-02	
K-40	1.58E+01	2.40E+00	2.83E-01	
MN-52	Not Detected	---	3.83E-02	
MN-54	Not Detected	---	3.32E-02	
MO-99	Not Detected	---	3.84E-01	
NA-22	Not Detected	---	4.13E-02	
NA-24	Not Detected	---	3.12E-01	
NB-95	Not Detected	---	2.23E-01	
ND-147	Not Detected	---	2.11E-01	
NI-57	~~1.09E-01~~	~~8.29E-02~~	6.59E-02	not detected J 4/12/97
PB-210	Not Detected	---	3.47E+01	
RU-103	Not Detected	---	2.85E-02	
RU-106	Not Detected	---	2.77E-01	
SB-122	~~1.11E-02~~	~~1.97E-02~~	3.01E-02	not detected J 4/12/97
SB-124	Not Detected	---	3.11E-02	
SB-125	Not Detected	---	7.80E-02	
SN-113	Not Detected	---	3.60E-02	
SR-85	Not Detected	---	3.59E-02	
TA-182	Not Detected	---	1.49E-01	
TA-183	Not Detected	---	5.24E-01	
TC-99m	Not Detected	---	8.83E+00	
TL-201	Not Detected	---	2.92E-01	
XE-133	Not Detected	---	2.77E-01	
Y-88	Not Detected	---	2.25E-02	
ZN-65	Not Detected	---	1.02E-01	
ZR-95	Not Detected	---	5.46E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
4-11-97 6:47:22 PM

Analyzed by: 4/12/97 Reviewed by: 4/14/97

Customer : M.YOUNG/MAC (6685/SMO)
Customer Sample ID : 033142-002
Lab Sample ID : 70054703

Sample Description : MARINELLI SOIL SAMPLE
Sample Quantity : 757.000 gram
Sample Date/Time : 4-10-97 9:30:00 AM
Acquire Start Date/Time : 4-11-97 5:04:36 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.34E+00
TH-234	Not Detected	---	7.82E-01
RA-226	1.92E+00	1.41E+00	5.89E-01
PB-214	8.23E-01	1.48E-01	4.60E-02
BI-214	7.32E-01	5.53E-01	2.36E-01
TH-232	6.24E-01	3.10E-01	1.37E-01
RA-228	6.77E-01	2.10E-01	1.52E-01
AC-228	7.26E-01	1.66E-01	8.22E-02
TH-228	5.55E-01	2.05E-01	4.49E-01
RA-224	7.08E-01	2.52E-01	7.95E-02
PB-212	7.12E-01	1.54E-01	3.90E-02
BI-212	4.63E-01	1.83E-01	1.60E-01
TL-208	7.25E-01	1.84E-01	5.97E-02
U-235	Not Detected	---	2.44E-01
TH-231	Not Detected	---	1.29E+01
PA-231	Not Detected	---	1.42E+00
TH-227	Not Detected	---	3.41E-01
RA-223	Not Detected	---	2.14E-01
RN-219	Not Detected	---	3.71E-01
PB-211	Not Detected	---	8.53E-01
TL-207	Not Detected	---	1.35E+01
AM-241	Not Detected	---	4.87E-01
PU-239	Not Detected	---	4.38E+02
NP-237	~~3.99E-01~~	~~2.26E-01~~	2.52E-01 not detected 4/12/97
PA-233	Not Detected	---	5.67E-02
TH-229	Not Detected	---	2.49E-01

[Summary Report] - Sample ID: : 70054703

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.86E-02
AG-110m	Not Detected	---	2.97E-02
BA-133	Not Detected	---	6.82E-02
BE-7	Not Detected	---	2.48E-01
CD-109	Not Detected	---	8.56E-01
CD-115	Not Detected	---	9.49E-02
CE-139	Not Detected	---	2.98E-02
CE-141	Not Detected	---	5.39E-02
CE-144	Not Detected	---	2.43E-01
CO-56	Not Detected	---	2.50E-02
CO-57	Not Detected	---	3.01E-02
CO-58	Not Detected	---	3.13E-02
CO-60	Not Detected	---	3.40E-02
CR-51	Not Detected	---	2.34E-01
CS-134	Not Detected	---	5.18E-02
CS-137	Not Detected	---	3.32E-02
EU-152	Not Detected	---	9.07E-02
EU-154	Not Detected	---	1.77E-01
EU-155	Not Detected	---	1.49E-01
FE-59	Not Detected	---	7.05E-02
GD-153	Not Detected	---	1.07E-01
HG-203	Not Detected	---	3.17E-02
I-131	Not Detected	---	3.08E-02
IR-192	Not Detected	---	2.74E-02
K-40	1.75E+01	2.55E+00	2.80E-01
MN-52	Not Detected	---	3.51E-02
MN-54	Not Detected	---	3.32E-02
MO-99	Not Detected	---	3.16E-01
NA-22	Not Detected	---	4.20E-02
NA-24	Not Detected	---	1.41E-01
NB-95	Not Detected	---	2.02E-01
ND-147	Not Detected	---	2.10E-01
NI-57	~~8.28E-02~~	~~8.60E-02~~	4.35E-02 Not detected
PB-210	Not Detected	---	3.48E+01
RU-103	Not Detected	---	2.89E-02
RU-106	Not Detected	---	2.94E-01
SB-122	Not Detected	---	5.31E-02
SB-124	Not Detected	---	3.09E-02
SB-125	Not Detected	---	8.07E-02
SN-113	Not Detected	---	3.61E-02
SR-85	Not Detected	---	3.58E-02
TA-182	Not Detected	---	1.48E-01
TA-183	Not Detected	---	4.99E-01
TC-99m	Not Detected	---	1.10E+00
TL-201	Not Detected	---	2.51E-01
XE-133	Not Detected	---	2.18E-01
Y-88	Not Detected	---	2.73E-02
ZN-65	Not Detected	---	1.02E-01
ZR-95	Not Detected	---	5.74E-02

4/12/17

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
4-11-97 8:32:24 PM

Analyzed by: 4/12/97 Reviewed by: 4/14/97

Customer : M.YOUNG/MAC (6685/SMO)
Customer Sample ID : 033160-002
Lab Sample ID : 70054704

Sample Description : MARINELLI SOIL SAMPLE
Sample Quantity : 681.000 gram
Sample Date/Time : 4-10-97 12:55:00 PM
Acquire Start Date/Time : 4-11-97 6:49:35 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.85E+00
TH-234	Not Detected	---	8.88E-01
RA-226	3.17E+00	8.20E-01	6.53E-01
PB-214	1.14E+00	1.98E-01	5.24E-02
BI-214	1.05E+00	2.44E-01	2.63E-01
TH-232	8.96E-01	4.79E-01	1.70E-01
RA-228	8.11E-01	3.67E-01	1.78E-01
AC-228	8.10E-01	5.08E-01	8.65E-02
TH-228	9.04E-01	4.39E-01	5.48E-01
RA-224	8.59E-01	3.16E-01	8.01E-02
PB-212	8.36E-01	1.56E-01	4.53E-02
BI-212	4.73E-01	2.69E-01	1.87E-01
TL-208	7.75E-01	1.57E-01	6.64E-02
U-235	Not Detected	---	2.77E-01
TH-231	Not Detected	---	1.51E+01
PA-231	Not Detected	---	1.63E+00
TH-227	Not Detected	---	3.87E-01
RA-223	Not Detected	---	2.50E-01
RN-219	Not Detected	---	4.39E-01
PB-211	Not Detected	---	9.74E-01
TL-207	Not Detected	---	1.53E+01
AM-241	Not Detected	---	5.60E-01
PU-239	Not Detected	---	5.09E+02
NP-237	Not Detected	---	2.76E-01
PA-233	Not Detected	---	6.47E-02
TH-229	Not Detected	---	2.84E-01

[Summary Report] - Sample ID: : 70054704

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---------	4.42E-02	
AG-110m	Not Detected	---------	3.34E-02	
BA-133	Not Detected	---------	8.32E-02	
BE-7	Not Detected	---------	2.86E-01	
CD-109	Not Detected	---------	9.37E-01	
CD-115	Not Detected	---------	1.07E-01	
CE-139	Not Detected	---------	3.35E-02	
CE-141	Not Detected	---------	6.12E-02	
CE-144	Not Detected	---------	2.79E-01	
CO-56	Not Detected	---------	2.78E-02	
CO-57	Not Detected	---------	3.49E-02	
CO-58	Not Detected	---------	3.59E-02	
CO-60	Not Detected	---------	4.04E-02	
CR-51	Not Detected	---------	2.77E-01	
CS-134	Not Detected	---------	6.14E-02	
CS-137	Not Detected	---------	3.62E-02	
EU-152	Not Detected	---------	1.05E-01	
EU-154	Not Detected	---------	2.03E-01	
EU-155	Not Detected	---------	1.66E-01	
FE-59	Not Detected	---------	7.66E-02	
GD-153	Not Detected	---------	1.20E-01	
HG-203	Not Detected	---------	3.67E-02	
I-131	Not Detected	---------	3.64E-02	
IR-192	Not Detected	---------	3.12E-02	
K-40	1.92E+01	2.84E+00	2.95E-01	
MN-52	Not Detected	---------	3.81E-02	
MN-54	Not Detected	---------	3.90E-02	
MO-99	Not Detected	---------	3.81E-01	
NA-22	Not Detected	---------	4.83E-02	
NA-24	Not Detected	---------	1.47E-01	
NB-95	Not Detected	---------	2.26E-01	
ND-147	Not Detected	---------	2.43E-01	
NI-57	~~1.36E-01~~	~~6.61E-02~~	~~4.93E-02~~	not detected 4/12/97
PB-210	Not Detected	---------	3.98E+01	
RU-103	Not Detected	---------	3.37E-02	
RU-106	~~3.76E-02~~	~~4.45E-02~~	~~1.64E-01~~	not detected 4/12/97
SB-122	Not Detected	---------	6.36E-02	
SB-124	Not Detected	---------	3.48E-02	
SB-125	Not Detected	---------	9.29E-02	
SN-113	Not Detected	---------	4.30E-02	
SR-85	Not Detected	---------	4.09E-02	
TA-182	Not Detected	---------	1.78E-01	
TA-183	Not Detected	---------	5.63E-01	
TC-99m	Not Detected	---------	1.04E+00	
TL-201	Not Detected	---------	2.78E-01	
XE-133	Not Detected	---------	2.48E-01	
Y-88	Not Detected	---------	2.97E-02	
ZN-65	Not Detected	---------	1.24E-01	
ZR-95	Not Detected	---------	6.44E-02	

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
4-12-97 10:36:47 AM
*
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Analyzed by: 4/12/97 Reviewed by: 4/14/97

Customer : M.YOUNG/MAC (6685/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 70054705

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 4-12-97 10:24:43 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.13E+04
TH-234	Not Detected	---	4.79E+03
RA-226	Not Detected	---	6.53E+03
PB-214	Not Detected	---	7.40E+02
BI-214	Not Detected	---	6.57E+02
TH-232	Not Detected	---	2.30E+03
RA-228	Not Detected	---	2.78E+03
AC-228	Not Detected	---	1.67E+03
TH-228	Not Detected	---	7.60E+04
RA-224	Not Detected	---	1.84E+03
PB-212	Not Detected	---	5.41E+03
BI-212	Not Detected	---	2.68E+04
TL-208	Not Detected	---	1.02E+04
U-235	Not Detected	---	1.86E+03
TH-231	Not Detected	---	8.43E+04
PA-231	Not Detected	---	1.50E+04
TH-227	Not Detected	---	2.49E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.86E+03
PB-211	Not Detected	---	1.31E+04
TL-207	Not Detected	---	2.22E+05
AM-241	8.18E+04	1.48E+04	3.48E+03
PU-239	Not Detected	---	3.27E+06
NP-237	Not Detected	---	2.63E+03
PA-233	Not Detected	---	6.58E+02
TH-229	Not Detected	---	1.82E+03

[Summary Report] - Sample ID: : 70054705

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.49E+02
AG-110m	Not Detected	---	1.17E+06
BA-133	Not Detected	---	7.15E+02
BE-7	Not Detected	---	7.31E+16
CD-109	4.25E+05	2.85E+05	2.28E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	3.31E+07
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	5.66E+05
CO-56	Not Detected	---	6.12E+11
CO-57	Not Detected	---	9.56E+04
CO-58	Not Detected	---	3.63E+12
CO-60	8.08E+04	1.09E+04	3.38E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	2.68E+03
CS-137	7.17E+04	9.53E+03	2.77E+02
EU-152	Not Detected	---	9.91E+02
EU-154	Not Detected	---	2.60E+03
EU-155	Not Detected	---	2.79E+03
FE-59	Not Detected	---	7.09E+18
GD-153	Not Detected	---	6.54E+05
HG-203	Not Detected	---	4.98E+17
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.19E+12
K-40	Not Detected	---	1.69E+03
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	7.21E+04
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.24E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
PB-210	Not Detected	---	2.64E+05
RU-103	Not Detected	---	4.18E+20
RU-106	Not Detected	---	2.63E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	1.80E+14
SB-125	Not Detected	---	5.77E+03
SN-113	Not Detected	---	6.64E+08
SR-85	Not Detected	---	3.23E+13
TA-182	Not Detected	---	1.81E+09
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	7.03E+08
ZN-65	Not Detected	---	7.38E+05
ZR-95	Not Detected	---	6.65E+13

Internal Lab
Batch No. _____ SAR/WR No. _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

SF 2001-COC (5-97)
Supersedes (6-95) issue

AR/COC- 510446

Dept. No./Mail Stop: 6134 / 1148
Project/Task Manager: ADS / PAVLETICH
Project Name: CCTA-ER68-RAD VCM
Record Center Code: 88 ~~EE~~ EE/1334/068/PAT
Logbook Ref No: MACTECH-ERS
Service Order No.: CFO 518

SMO USE
Date Samples Shipped: _____
Carrier/Waybill No.: _____
Lab Contact: ROSE PRESTON
Lab Destination: RMWMF
SMO Contact/Phone: SALMI / 844-3110
Send Report to SMO _____

Contract No.: _____
Case No.: 77215.220700
SMO Authorization _____
Bill to: Sandia National Laboratories
Supplier Services
Department
P.O. Box 5800 MS 0154

Location
Tech Area N/A
Building _____ Room _____

Parameter & Method Requested

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	GAMMA SPECTROSCOPY	Lab Sample ID
041312-001	71E23AA-SS	N/A	68	6/14/98 1400	SOIL	P	500mL	N/A	G	SA	X	
313	71E23AB-SS			6/14/98 1400							X	
314	71E23AC-SS			6/14/98 1400							X	
315	71E23AD-SS			6/14/98 1400							X	
316	71E23AD-SD			6/14/98 1400							X	LAB USE
317	71E23AE-SS			6/14/98 1400							X	
318	71E23AF-SS			6/14/98 1400							X	
319	71E23AG-SS			6/14/98 1400							X	
320	71E23AH-SS			6/14/98 1400							X	

RMMA ☒ Yes ☐ No Ref. No. _____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date _____

Sample Tracking SMO USE
Date Entered (mm/dd/yy) _____
Entered by: _____
QC inits. _____

Special Instructions/QC Requirements
PLEASE FAX RESULTS TO JOE PAVLETICH @ 505-284-2617 and send hard copy to MS-1148

Abnormal Conditions on Receipt
LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Karl Antwine	Karl Antwine	KA	MACTEC-ERS
	Stacey Steele	Stacey Steele	SS	"

1. Relinquished by	Karl Antwine	Org.		Date 06-15-98	Time 1550	4. Relinquished by	Org.	Date	Time
1. Received by	Jenny Zorona	Org.	07523	Date 06-15-98	Time 1550	4. Received by	Org.	Date	Time
2. Relinquished by	Jenny Zorona	Org.	07523	Date 6/16/98	Time 0740	5. Relinquished by	Org.	Date	Time
2. Received by	R Preston	Org.	7598	Date 6/16/98	Time 0740	5. Received by	Org.	Date	Time
3. Relinquished by	S.B. Salmi	Org.	7578	Date 6/22/98	Time 1605	6. Relinquished by	Org.	Date	Time
3. Received by	Jenny Zorona	Org.	07523	Date 06-22-98	Time 1605	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

Internal Lab Batch No. 700590

AR/COC- 06580

SF 2001-COC (6-95)

Dept. No./Mail Stop: 6665 MS 1198
Project/Task Manager: Mike Young
Project Name: Site 58 Borehole
Record Center Code: ER/1332/58/DAT
Logbook Ref No: #190
Service Order No.: CF0180

Date Samples Shipped: 4/16/97
Carrier/Waybill No.: HC
Lab Contact: Fernando Rommayer
Lab Destination: RPSD Bldg. 881
SMO Contact/Phone: Doug Salmi 848-0963
Send Report to SMO: Kathy Becker

Contract No.: N/A
Case No.: 3622.420
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

GAMMA SPEC

Location Tech Area ER site 58
Building N/A Room N/A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	GAMMA SPEC	Lab Sample ID
✓ 033169-002	558-BH4-070-050-SA	50'	58	4-14-97 1005	S	M	500ml	None	G	SA	X	
✓ 033187-002	558-BH6-030-50'-SA	50'		4-14-97 1245								
✓ 033196-002	558-BH7-035-050-SA	50'	↓	4-15-97 1145	↓	↓	↓	↓	↓	↓	↓	
-												
-												
-												
-												
-												
-												
-												

RMMA ☐ Yes ☒ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☒ Rush Required Report Date 4/17/97-AM

Sample Tracking
Date Entered (mm/dd/yy):
Entered by:
QC Inits:

Special Instructions/QC Requirements
- Send as separate report
- The Custom Radioactive Material labels were put on the samples for precautionary purposes.

Abnormal Conditions on Receipt

Sample Team Members

Name	Signature	Init	Company/Organization/Phone
Nelun Capitan		NC	IT/6684 284-3307
Gilbert L. Quintana		GLQ	IT/6684 284-3307

1. Relinquished by		Org. IT/6684	Date 4-16-97	Time 1515	4. Relinquished by	Org.	Date	Time
1. Received by		Org. SNL7578	Date 4/16/97	Time 1515	4. Received by	Org.	Date	Time
2. Relinquished by		Org. SNL78	Date 4/16/97	Time 1543	5. Relinquished by	Org.	Date	Time
2. Received by		Org. 7578	Date 4/16/97	Time 1543	5. Received by	Org.	Date	Time
3. Relinquished by	for GLS	Org. SNL7578	Date 4/17/97	Time 0940	6. Relinquished by	Org.	Date	Time
3. Received by		Org. SNL7578	Date 4/17/97	Time 0940	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-16-97 5:55:27 PM *
****

* Analyzed by: 4/17/97 Reviewed by: 4/17/97 *

Customer : M. YOUNG/MAC (6685/SMO)
Customer Sample ID : 033169-002
Lab Sample ID : 70059001

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 881.000 gram
Sample Date/Time : 4-11-97 10:05:00 AM
Acquire Start Date/Time : 4-16-97 4:06:25 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	2.83E+00	
TH-234	Not Detected	---	6.93E-01	
RA-226	1.47E+00	2.40E+00	4.51E-01	
PB-214	6.36E-01	1.18E-01	4.07E-02	
BI-214	6.02E-01	2.33E-01	2.03E-01	
TH-232	6.70E-01	1.30E+00	1.20E-01	
RA-228	6.82E-01	2.08E-01	1.22E-01	
AC-228	6.92E-01	2.03E-01	6.94E-02	
TH-228	6.13E-01	2.73E-01	4.09E-01	
RA-224	6.85E-01	2.12E-01	5.54E-02	
PB-212	6.21E-01	1.38E-01	3.72E-02	
BI-212	Not Detected	---	1.49E-01	
TL-208	6.23E-01	7.24E-01	5.57E-02	
U-235	Not Detected	---	2.16E-01	
TH-231	Not Detected	---	1.11E+01	
PA-231	Not Detected	---	1.28E+00	
TH-227	Not Detected	---	2.96E-01	
RA-223	Not Detected	---	2.31E-01	
RN-219	Not Detected	---	3.20E-01	
PB-211	Not Detected	---	7.29E-01	
TL-207	Not Detected	---	1.20E+01	
AM-241	Not Detected	---	4.02E-01	
PU-239	Not Detected	---	3.89E+02	
NP-237	~~2.77E-01~~	~~1.98E-01~~	2.20E-01	NOT DETECTED KAT 4/17/97
PA-233	Not Detected	---	4.97E-02	
TH-229	Not Detected	---	2.20E-01	

[Summary Report] - Sample ID: : 70059001

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.47E-02
AG-110m	Not Detected	---------	2.61E-02
BA-133	Not Detected	---------	5.72E-02
BE-7	Not Detected	---------	2.38E-01
CD-109	Not Detected	---------	7.50E-01
CD-115	Not Detected	---------	2.83E-01
CE-139	Not Detected	---------	2.68E-02
CE-141	Not Detected	---------	5.15E-02
CE-144	Not Detected	---------	2.17E-01
CO-56	Not Detected	---------	2.12E-02
CO-57	Not Detected	---------	2.74E-02
CO-58	Not Detected	---------	3.02E-02
CO-60	Not Detected	---------	3.22E-02
CR-51	Not Detected	---------	2.27E-01
CS-134	Not Detected	---------	4.29E-02
CS-137	Not Detected	---------	2.78E-02
EU-152	Not Detected	---------	8.16E-02
EU-154	Not Detected	---------	1.61E-01
EU-155	Not Detected	---------	1.31E-01
FE-59	Not Detected	---------	6.89E-02
GD-153	Not Detected	---------	9.45E-02
HG-203	Not Detected	---------	3.03E-02
I-131	Not Detected	---------	3.89E-02
IR-192	Not Detected	---------	2.42E-02
K-40	1.86E+01	2.70E+00	2.26E-01
MN-52	Not Detected	---------	4.95E-02
MN-54	Not Detected	---------	2.94E-02
MO-99	Not Detected	---------	7.75E-01
NA-22	Not Detected	---------	3.83E-02
NA-24	Not Detected	---------	9.51E+00
NB-95	Not Detected	---------	3.73E-01
ND-147	Not Detected	---------	2.39E-01
NI-57	Not Detected	---------	4.97E-01
PB-210	Not Detected	---------	3.06E+01
RU-103	Not Detected	---------	2.70E-02
RU-106	Not Detected	---------	2.49E-01
SB-122	Not Detected	---------	1.33E-01
SB-124	Not Detected	---------	2.72E-02
SB-125	Not Detected	---------	7.07E-02
SN-113	Not Detected	---------	3.25E-02
SR-85	Not Detected	---------	3.36E-02
TA-182	Not Detected	---------	1.35E-01
TA-183	Not Detected	---------	7.09E-01
TC-99m	Not Detected	---------	5.33E+04
TL-201	Not Detected	---------	5.24E-01
XE-133	Not Detected	---------	6.59E-01
Y-88	Not Detected	---------	2.34E-02
ZN-65	Not Detected	---------	8.97E-02
ZR-95	Not Detected	---------	5.31E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

4-16-97 7:47:14 PM

* Analyzed by: [signature] 4/17/97 Reviewed by: [signature] 4/17/97

Customer : M. YOUNG/MAC (6685/SMO)
Customer Sample ID : 033187-002
Lab Sample ID : 70059002

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 737.000 gram
Sample Date/Time : 4-14-97 12:45:00 PM
Acquire Start Date/Time : 4-16-97 5:58:07 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	3.34E+00	
TH-234	1.44E+00	9.09E-01	9.05E-01	
RA-226	2.11E+00	1.04E+00	6.39E-01	
PB-214	8.49E-01	1.39E-01	4.49E-02	
BI-214	7.19E-01	3.51E-01	2.42E-01	
TH-232	8.03E-01	4.04E-01	1.35E-01	
RA-228	9.13E-01	1.73E+00	1.49E-01	
AC-228	8.53E-01	2.17E-01	7.87E-02	
TH-228	8.52E-01	4.45E-01	4.79E-01	
RA-224	8.21E-01	2.56E-01	7.46E-02	
PB-212	8.01E-01	1.31E-01	4.01E-02	
BI-212	5.55E-01	3.82E-01	1.90E-01	
TL-208	7.61E-01	2.01E-01	6.45E-02	
U-235	Not Detected	---	2.47E-01	
TH-231	Not Detected	---	1.29E+01	
PA-231	Not Detected	---	1.44E+00	
TH-227	Not Detected	---	3.57E-01	
RA-223	Not Detected	---	2.30E-01	
RN-219	~~2.48E-01~~	~~3.10E-01~~	3.74E-01	not detected 4/17/97
PB-211	Not Detected	---	8.44E-01	
TL-207	Not Detected	---	1.32E+01	
AM-241	Not Detected	---	4.87E-01	
PU-239	Not Detected	---	4.59E+02	
NP-237	~~6.98E-01~~	~~3.98E-01~~	3.68E-01	NOT DETECTED 4/17/97
PA-233	Not Detected	---	5.70E-02	
TH-229	Not Detected	---	2.54E-01	

[Summary Report] - Sample ID: : 70059002

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.16E-02
AG-110m	Not Detected	---	2.92E-02
BA-133	Not Detected	---	7.10E-02
BE-7	Not Detected	---	2.52E-01
CD-109	Not Detected	---	1.25E+00
CD-115	Not Detected	---	1.29E-01
CE-139	Not Detected	---	3.08E-02
CE-141	Not Detected	---	5.57E-02
CE-144	Not Detected	---	2.48E-01
CO-56	Not Detected	---	2.63E-02
CO-57	Not Detected	---	3.02E-02
CO-58	Not Detected	---	3.32E-02
CO-60	Not Detected	---	3.45E-02
CR-51	Not Detected	---	2.39E-01
CS-134	Not Detected	---	5.10E-02
CS-137	Not Detected	---	3.29E-02
EU-152	Not Detected	---	9.05E-02
EU-154	Not Detected	---	1.90E-01
EU-155	Not Detected	---	1.55E-01
FE-59	Not Detected	---	7.20E-02
GD-153	Not Detected	---	1.05E-01
HG-203	Not Detected	---	3.30E-02
I-131	Not Detected	---	3.51E-02
IR-192	Not Detected	---	2.69E-02
K-40	1.61E+01	2.38E+00	2.73E-01
MN-52	Not Detected	---	3.96E-02
MN-54	Not Detected	---	3.59E-02
MO-99	Not Detected	---	4.07E-01
NA-22	Not Detected	---	3.98E-02
NA-24	Not Detected	---	3.70E-01
NB-95	Not Detected	---	2.51E-01
ND-147	Not Detected	---	2.21E-01
NI-57	~~1.58E-01~~	~~1.29E-01~~	7.83E-02 not detected 4/17/97
PB-210	Not Detected	---	3.58E+01
RU-103	Not Detected	---	2.83E-02
RU-106	Not Detected	---	2.93E-01
SB-122	Not Detected	---	6.56E-02
SB-124	Not Detected	---	3.14E-02
SB-125	Not Detected	---	8.09E-02
SN-113	Not Detected	---	3.78E-02
SR-85	Not Detected	---	3.79E-02
TA-182	Not Detected	---	1.51E-01
TA-183	Not Detected	---	5.62E-01
TC-99m	Not Detected	---	1.35E+01
TL-201	Not Detected	---	3.22E-01
XE-133	Not Detected	---	2.88E-01
Y-88	Not Detected	---	2.59E-02
ZN-65	Not Detected	---	1.04E-01
ZR-95	Not Detected	---	5.83E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-16-97 9:39:14 PM *
****

* Analyzed by: 4/17/97 Reviewed by: 4/17/97 *

Customer : M. YOUNG/MAC (6685/SMO)
Customer Sample ID : 033196-002
Lab Sample ID : 70059003

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 693.000 gram
Sample Date/Time : 4-15-97 11:45:00 AM
Acquire Start Date/Time : 4-16-97 7:49:54 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.44E+00
TH-234	1.14E+00	1.15E+00	8.80E-01
RA-226	1.57E+00	7.67E-01	5.40E-01
PB-214	6.91E-01	1.29E-01	5.05E-02
BI-214	6.28E-01	2.01E-01	2.58E-01
TH-232	8.17E-01	3.97E-01	1.55E-01
RA-228	9.31E-01	2.87E-01	1.52E-01
AC-228	9.12E-01	2.42E-01	7.97E-02
TH-228	1.02E+00	2.99E-01	4.37E-01
RA-224	9.30E-01	2.87E-01	8.33E-02
PB-212	8.40E-01	1.38E-01	3.94E-02
BI-212	5.42E-01	1.96E-01	1.78E-01
TL-208	7.49E-01	5.76E-01	6.52E-02
U-235	~~1.33E-01~~	2.01E-01	2.59E-01
TH-231	Not Detected	---	1.33E+01
PA-231	Not Detected	---	1.52E+00
TH-227	Not Detected	---	3.71E-01
RA-223	Not Detected	---	2.22E-01
RN-219	Not Detected	---	3.89E-01
PB-211	Not Detected	---	8.67E-01
TL-207	Not Detected	---	1.38E+01
AM-241	Not Detected	---	4.74E-01
PU-239	Not Detected	---	4.64E+02
NP-237	Not Detected	---	4.03E-01
PA-233	Not Detected	---	5.99E-02
TH-229	Not Detected	---	2.60E-01

not detected 4/17/97

[Summary Report] - Sample ID: : 70059003

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	4.20E-02	
AG-110m	Not Detected	---	3.80E-02	
BA-133	Not Detected	---	6.86E-02	
BE-7	Not Detected	---	2.68E-01	
CD-109	~~1.72E+00~~	~~1.24E+00~~	8.34E-01	NOT DETECTED KAT 4/17/97
CD-115	Not Detected	---	1.03E-01	
CE-139	Not Detected	---	3.08E-02	
CE-141	Not Detected	---	5.71E-02	
CE-144	Not Detected	---	2.55E-01	
CO-56	Not Detected	---	3.08E-02	
CO-57	Not Detected	---	3.11E-02	
CO-58	Not Detected	---	3.26E-02	
CO-60	Not Detected	---	3.49E-02	
CR-51	Not Detected	---	2.47E-01	
CS-134	Not Detected	---	4.98E-02	
CS-137	5.03E-02	2.07E-02	2.20E-02	
EU-152	Not Detected	---	9.35E-02	
EU-154	Not Detected	---	1.92E-01	
EU-155	Not Detected	---	1.56E-01	
FE-59	Not Detected	---	7.21E-02	
GD-153	Not Detected	---	1.09E-01	
HG-203	Not Detected	---	3.32E-02	
I-131	Not Detected	---	3.30E-02	
IR-192	Not Detected	---	2.84E-02	
K-40	1.67E+01	2.45E+00	2.96E-01	
MN-52	Not Detected	---	3.54E-02	
MN-54	Not Detected	---	3.63E-02	
MO-99	Not Detected	---	3.44E-01	
NA-22	Not Detected	---	4.64E-02	
NA-24	Not Detected	---	1.42E-01	
NB-95	Not Detected	---	2.21E-01	
ND-147	Not Detected	---	2.15E-01	
NI-57	Not Detected	---	4.96E-02	
PB-210	Not Detected	---	3.62E+01	
RU-103	Not Detected	---	2.95E-02	
RU-106	Not Detected	---	2.91E-01	
SB-122	Not Detected	---	5.76E-02	
SB-124	Not Detected	---	3.21E-02	
SB-125	Not Detected	---	8.37E-02	
SN-113	Not Detected	---	3.91E-02	
SR-85	Not Detected	---	3.94E-02	
TA-182	Not Detected	---	1.53E-01	
TA-183	Not Detected	---	4.85E-01	
TC-99m	Not Detected	---	1.23E+00	
TL-201	Not Detected	---	2.56E-01	
XE-133	Not Detected	---	2.28E-01	
Y-88	Not Detected	---	2.92E-02	
ZN-65	Not Detected	---	1.03E-01	
ZR-95	Not Detected	---	5.98E-02	

Survey #:_____

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

4-17-97 7:26:43 AM

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Analyzed by: [signature] 4/17/97 Reviewed by: [signature] 4/17/97

****

Customer : M. YOUNG/MAC (6685/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 70059004

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 4-17-97 7:14:43 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.18E+04
TH-234	Not Detected	---	4.75E+03
RA-226	Not Detected	---	6.38E+03
PB-214	Not Detected	---	7.43E+02
BI-214	Not Detected	---	6.88E+02
TH-232	Not Detected	---	2.36E+03
RA-228	Not Detected	---	2.72E+03
AC-228	Not Detected	---	1.68E+03
TH-228	Not Detected	---	7.52E+04
RA-224	Not Detected	---	2.39E+03
PB-212	Not Detected	---	5.47E+03
BI-212	Not Detected	---	2.81E+04
TL-208	Not Detected	---	1.02E+04
U-235	Not Detected	---	1.84E+03
TH-231	Not Detected	---	8.54E+04
PA-231	Not Detected	---	1.52E+04
TH-227	Not Detected	---	2.53E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.80E+03
PB-211	Not Detected	---	1.31E+04
TL-207	Not Detected	---	2.25E+05
AM-241	8.08E+04	1.47E+04	3.15E+03
PU-239	Not Detected	---	3.31E+06
NP-237	Not Detected	---	2.59E+03
PA-233	Not Detected	---	6.33E+02
TH-229	Not Detected	---	1.80E+03

Page _____ of _____

Survey #:_____

[Summary Report] - Sample ID: : 70059004

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.59E+02
AG-110m	Not Detected	---	1.18E+06
BA-133	Not Detected	---	7.13E+02
BE-7	Not Detected	---	7.67E+16
CD-109	3.79E+05	6.82E+04	2.05E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	3.45E+07
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	5.86E+05
CO-56	Not Detected	---	6.32E+11
CO-57	Not Detected	---	9.54E+04
CO-58	Not Detected	---	3.79E+12
CO-60	8.13E+04	1.09E+04	3.45E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	2.76E+03
CS-137	7.13E+04	9.48E+03	2.80E+02
EU-152	Not Detected	---	9.77E+02
EU-154	Not Detected	---	2.69E+03
EU-155	Not Detected	---	2.87E+03
FE-59	Not Detected	---	8.03E+18
GD-153	Not Detected	---	6.57E+05
HG-203	Not Detected	---	5.43E+17
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.24E+12
K-40	Not Detected	---	1.70E+03
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	7.26E+04
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.33E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
PB-210	Not Detected	---	2.61E+05
RU-103	Not Detected	---	4.64E+20
RU-106	Not Detected	---	2.61E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	1.92E+14
SB-125	Not Detected	---	5.81E+03
SN-113	Not Detected	---	6.82E+08
SR-85	Not Detected	---	3.36E+13
TA-182	Not Detected	---	1.91E+09
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	7.90E+08
ZN-65	Not Detected	---	7.67E+05
ZR-95	Not Detected	---	7.44E+13

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*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program
* Quality Assurance Report
*
****

Report Date : 4-17-97 7:27:20 AM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 70059004
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 4-17-97 7:14:43 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.134E-02	3.498E-03	8.076E-02	<	Ac:		>
CS-137 Activity	6.828E-02	1.958E-03	7.128E-02	<	In		>
CO-60 Activity	7.487E-02	1.664E-03	8.104E-02	<	Ac:		>

OK KS

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: KS 4/17/97

ANALYSIS REQUEST AND CHAIN OF CUSTODY

F 2001-COC (6-95)

Internal Lab Batch No. 6911415

AR/COC- 05713

Dept. No./Mail Stop: 7585/ms 1148
Project/Task Manager: MIKE YOUNG/284-2575
Project Name: FOOTHILLS TEST AREA
Record Center Code: ER/1332/58/DAT
Logbook Ref No: 6190
Service Order No.: CF0180

Date Samples Shipped: 9/5/96
Carrier/Waybill No.: HC
Lab Contact: FERNANDO DOMINGUEZ
Lab Destination: RFSD BUILDING 881
SMO Contact/Phone: DOUG SALMI/848-0963
Send Report to SMO KATHI BECKER

Contract No.: AL2480A
3622.40 Case No.: 362854000
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested: GAMMA SPEC.

Location: Tech Area "II" ER Site 58
Building N/A Room N/A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
031187-001	58FFC-BH-001-5'-0"-21'-0"	5'-0"-21'-0"	58	8/20/96 11:10	SOIL	P	500	NONE	C	SA	
031197-001	58FFC-BH-002-5'-0"-21'-0"	5'-0"-21'-0"	58	8/21/96 1200	SOIL	P	500	NONE	C	SA	
031194-002	58FFC-BH-003-5'-0"	5'-0"	58	8/21/96 1415	SOIL	P	500	NONE	G	SA	
031195-002	58FFC-BH-003-10'-0"	10'-0"	58	8/21/96 1445	SOIL	P	500	NONE	G	SA	
031196-002	58FFC-BH-003-19'-0"	19'-0"	58	8/21/96 1600	SOIL	P	500	NONE	G	SA	
031197-002	58FFC-BH-003-24'-0"	24'-0"	58	8/26/96 1030	SOIL	P	500	NONE	G	SA	
031198-002	58FFC-BH-003-29'-0"	29'-0"	58	8/26/96 1340	SOIL	P	500	NONE	G	SA	
031199-002	58FFC-BH-004-5'-0"	5'-0"		8/27/96 1034							
031200-002	58FFC-BH-004-10'-0"	10'-0"		8/27/96 1054							
031201-002	58FFC-BH-004-19'-0"	19'-0"		8/27/96 1129							

RMMA Yes No Ref. No.

Sample Disposal Return to Client Disposal by lab

Turnaround Time Normal Rush Required Report Date

Sample Tracking
Date Entered (mm/dd/yy): 9/16/96
Entered by:
QC Inits:

Special Instructions/QC Requirements
SEND REPORT TO MIKE YOUNG

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciato	Concetta Cacciato	CC	Lamb/7584/284-3301
	Enrique Ross		ER	Lamb/7584/284-3308
	Kai Nagel		KN	IT/1894

1. Relinquished by	Kai Nagel	Org. IT/1894	Date 9-9-96	Time 1201	4. Relinquished by		Org.	Date	Time
1. Received by		Org. 7513	Date 9-9-96	Time 1241	4. Received by		Org.	Date	Time
2. Relinquished by		Org. 7513	Date 9/10/96	Time 1306	5. Relinquished by		Org.	Date	Time
2. Received by		Org. SNL 7578	Date 9/10/96	Time 1306	5. Received by		Org.	Date	Time
3. Relinquished by		Org. SNL 7578	Date 9/12/96	Time 1130	6. Relinquished by		Org.	Date	Time
3. Received by		Org. 7578	Date 9/12/96	Time 1130	6. Received by		Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy

SF 2001-COD (9-94)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC- 05713

Batch #601645

Project Name: Foothills Test Area Project/Task Manager: Mike Young Case No.: 3622.400

Location Tech Area ER Sites 55

Building V4 Room 1A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Parameter & Method Requested												Lab Sample ID
					Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec												
031203-002	55FFC-BH-004-24-0-S	24'0"	55	8/27/96 1350	Soil	P	500ml	None	G	SA	X												
031204-002	55FFC-BH-004-29-0-S	29'0		1400							X												
031205-002	55FFC-BH-006-5-0-S	5'0"		1545							X												
031206-002	55FFC-BH-006-10-0-S	10'0"		1555							X												
031206-002	55FFC-BH-006-19-0-S	19'0"		8/28/96 1450							X												
031207-002	55FFC-BH-006-24-0-S	24'0"		1500							X												
031208-002	55FFC-BH-006-29-0-S	29'0"		8/29/96 0955							X												
031209-002	55FFC-BH005-5-0-S	5'0"		1250							X												
031210-002	55FFC-BH005-10-0-S	10'0"		1300							X												
031211-002	55FFC-BH-005-19-0-S	19'0"		9/4/96 1415							X												
031212-002	55FFC-BH-005-24-0-S	24'0"		1445							X												
031213-002	55FFC-BH-005-29-0-S	29'0"		1445						DU	X												
031214-002	55FFC-BH-005-29-0-S	29'0																					
031221-002	55FFC-PEM-090596-2	0'		9/5/96 0930	Soil	P	500ml	None	G	SA	X												

Abnormal Conditions on Receipt

Recipient Initials _____

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 2

Shaded areas are for RPSD use only

To be completed by Customer

Customer: Mike Young
Organization: 2585
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: 9-18-96
Suspect Isotopes: Unk
Other Information: C.O.C # 05713

Hazards/Special Instructions:
RMMA samples used to as screen for off site samples

Batch Log Number: 601645
Logged By: ~~Jm~~
LIMS Login
Results Faxed
Sample Disposal

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
031187-001	Soil	8-20 96 1110	500 ml	Gamma Spec	01	<300	735	
031193-001		8-21 96 1200			02		836	
031194-002		8-21 96 1430			03		784	
031195-002		8-21 96 1445			04		714	
031196-002		8-21 96 1600			05		869	
031197-002		8-26 96 1030			06		659	
031198-002		8-26 96 1340			07		741	
031199-002		8-27 96 0840			08		639	
031200-002		8-27 96 0855			09		790	
031201-002		8-27 96 1125			10		901	
031202-002		8-27 96 1350			11		777	
031203-002		8-27 96 1400			12		764	
031204-002		8-27 96 1545			13		903	
031205-002		8-27 96 1555			14	<300	920	

Relinquished by		Date 9/9/96	Time 1306	Received by		Date 9/5/96	Time 1306
Relinquished by		Date 9/12/96	Time 1130	Received by		Date 9/12/96	Time 1100
Relinquished by		Date	Time	Received by		Date	Time
Relinquished by		Date	Time	Received by		Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 2585
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: 9-18-96
Suspect Isotopes: Unk
Other Information: C.O.C # 05713

Hazards/Special Instructions:
RMMA samples

Batch Log Number: 601645
Logged By:

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
031206-002	Soil	8-28 96 1450	500ml	Gamma Spec	15	2360	856	
031207-002	↓	8-28 96 1500	↓	↓	16	↓	812	
031208-002		8-29 96 0955			17		540	
031209-002		8-29 96 1250			18		657	
031210-002		8-29 96 1300			19		806	
031211-002		9-4 96 1415			20		716	
031212-002		9-4 96 1445			21		792	
031213-002		9-4 96 1445			22		749	
031221-002	↓	9-5 96 0930	↓	↓	23	↓	835	
LCS	—	10-00-90	—	Y Spec	24	NA	NA	

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 2

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 2585
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: _____
Suspect Isotopes: _____
Other Information: C.O.C# 05713

Hazards/Special Instructions:
RMMA samples used to as screen for off site samples

Batch Log Number: _____
Logged By: _____

Analysis Type:
- ☐ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login _____
Results Faxed _____
Sample Disposal _____

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
031187-001	Soil	8-20 96 1110	500 ml	Gamma Spec				
031193-001		8-21 96 1200						
031194-002		8-21 96 1430						
031195-002		8-21 96 1445						
031196-002		8-21 96 1600						
031197-002		8-26 96 1030						
031198-002		8-26 96 1340						
031199-002		8-27 96 0840						
031200-002		8-27 96 0855						
031201-002		8-27 96 1125						
031202-002		8-27 96 1350						
031203-002		8-27 96 1400						
031204-002		8-27 96 1545						
031205-002	↓	8-27 96 1555	↓	↓				

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 2 of 2

Shaded areas are for RPSD use only

To be completed by Customer

Customer: Mike Young
Organization: 2585
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: _____
Suspect Isotopes: _____
Other Information: C.O.C # 05713

Hazards/Special Instructions:
RMMA samples

Batch Log Number: _____
Logged By: _____

Analysis Type:
- ☐ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login _____
Results Faxed _____
Sample Disposal _____

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
031206-002	Soil	8-28 96 1450	500ml	Gamma Spec				
031207-002	↓	8-28 96 1500	↓	↓				
031208-002		8-29 96 0955						
031209-002		8-29 96 1250						
031210-002		8-29 96 1300						
031211-002		9-4 96 1415						
031212-002		9-4 96 1445						
031213-002		9-4 96 1445						
031221-002		9-5 96 0930						

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-09-96 5:57:51 PM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 031187-001
Lab Sample ID : 60164501

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 735.000 gram
Sample Date/Time : 8-20-96 11:10:00 AM
Acquire Start Date/Time : 9-09-96 4:13:47 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	8.72E-01
TH-234	6.38E-01	2.47E-01	3.91E-01
RA-226	1.51E+00	5.16E-01	5.17E-01
PB-214	5.87E-01	1.61E-01	1.87E-01
BI-214	5.44E-01	1.31E-01	4.73E-02
TH-232	5.26E-01	3.39E-01	1.51E-01
RA-228	7.46E-01	3.73E-01	1.59E-01
AC-228	6.20E-01	2.67E-01	9.40E-02
TH-228	6.79E-01	3.58E-01	4.55E-01
RA-224	6.33E-01	2.88E-01	8.36E-02
PB-212	6.13E-01	1.41E-01	3.66E-02
BI-212	5.37E-01	2.88E-01	3.29E-01
TL-208	5.63E-01	5.44E-01	6.63E-02
U-235	Not Detected	---	1.68E-01
TH-231	Not Detected	---	1.65E+00
PA-231	Not Detected	---	1.28E+00
TH-227	Not Detected	---	3.01E-01
RA-223	Not Detected	---	3.91E-01
RN-219	Not Detected	---	3.47E-01
PB-211	Not Detected	---	7.91E-01
TL-207	Not Detected	---	1.42E+01
AM-241	Not Detected	---	1.63E-01
PU-239	Not Detected	---	3.23E+02
NP-237	Not Detected	---	2.46E-01
PA-233	Not Detected	---	5.51E-02
TH-229	Not Detected	---	1.93E-01

[Summary Report] - Sample ID: : 60164501

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-110m	Not Detected	---	3.11E-02	
BA-133	Not Detected	---	3.90E-02	
BE-7	Not Detected	---	3.05E-01	
CD-109	~~1.14E+00~~	~~3.92E-01~~	6.24E-01	NOT DETECTED KAT 9/10/96
CD-115	Not Detected	---	3.28E+01	
CE-139	Not Detected	---	2.76E-02	
CE-141	Not Detected	---	5.99E-02	
CE-144	Not Detected	---	1.80E-01	
CO-56	Not Detected	---	4.33E-02	
CO-57	Not Detected	---	2.35E-02	
CO-58	Not Detected	---	4.02E-02	
CO-60	Not Detected	---	3.88E-02	
CR-51	Not Detected	---	3.34E-01	
CS-134	Not Detected	---	4.54E-02	
CS-137	Not Detected	---	3.44E-02	
EU-152	Not Detected	---	8.08E-02	
EU-154	Not Detected	---	1.26E-01	
EU-155	Not Detected	---	9.73E-02	
FE-59	Not Detected	---	9.53E-02	
GD-153	Not Detected	---	7.97E-02	
HG-203	Not Detected	---	3.58E-02	
I-131	Not Detected	---	1.43E-01	
IR-192	Not Detected	---	3.03E-02	
K-40	1.49E+01	2.37E+00	3.08E-01	
MN-54	Not Detected	---	3.71E-02	
MO-99	Not Detected	---	4.02E+01	
NA-22	Not Detected	---	4.38E-02	
NA-24	Not Detected	---	1.87E+08	
NB-94	Not Detected	---	3.08E-02	
NB-95	Not Detected	---	5.65E+00	
ND-147	Not Detected	---	7.00E-01	
NI-57	Not Detected	---	6.52E+02	
RU-103	Not Detected	---	3.71E-02	
RU-106	Not Detected	---	2.92E-01	
SB-122	Not Detected	---	7.11E+00	
SB-124	Not Detected	---	3.86E-02	
SB-125	Not Detected	---	7.88E-02	
SR-85	Not Detected	---	4.45E-02	
TA-182	Not Detected	---	1.83E-01	
TA-183	Not Detected	---	2.17E+00	
TC-99m	Not Detected	---	1.00E+26	
TL-201	Not Detected	---	6.91E+00	
XE-133	Not Detected	---	4.44E+01	
Y-88	Not Detected	---	3.37E-02	
ZN-65	Not Detected	---	1.14E-01	
ZR-95	Not Detected	---	7.09E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-09-96 7:44:19 PM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031193-001
ab Sample ID : 60164502

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 836.000 gram
ample Date/Time : 8-21-96 12:00:00 PM
cquire Start Date/Time : 9-09-96 6:00:21 PM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.14E+00
TH-234	Not Detected	---	4.68E-01
RA-226	1.17E+00	3.98E-01	4.40E-01
PB-214	5.13E-01	1.67E-01	1.65E-01
BI-214	4.98E-01	1.05E-01	4.20E-02
TH-232	5.66E-01	2.84E-01	1.24E-01
RA-228	6.74E-01	2.68E-01	1.35E-01
AC-228	5.73E-01	3.25E-01	8.18E-02
TH-228	4.51E-01	2.54E-01	3.31E-01
RA-224	6.09E-01	4.25E-01	7.75E-02
PB-212	5.78E-01	1.15E-01	3.33E-02
BI-212	5.91E-01	3.11E-01	3.11E-01
TL-208	5.12E-01	1.38E-01	5.58E-02
U-235	Not Detected	---	1.56E-01
TH-231	Not Detected	---	1.53E+00
PA-231	Not Detected	---	1.18E+00
TH-227	Not Detected	---	2.79E-01
RA-223	Not Detected	---	3.18E-01
RN-219	Not Detected	---	3.31E-01
PB-211	Not Detected	---	7.62E-01
TL-207	Not Detected	---	1.22E+01
AM-241	Not Detected	---	1.46E-01
PU-239	Not Detected	---	2.85E+02
NP-237	Not Detected	---	2.15E-01
PA-233	Not Detected	---	4.82E-02
TH-229	Not Detected	---	1.71E-01

[Summary Report] - Sample ID: : 60164502

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-110m	Not Detected	---	2.82E-02	
BA-133	Not Detected	---	3.44E-02	
BE-7	Not Detected	---	1.40E-01	
CD-109	~~8.19E-01~~	~~3.91E-01~~	5.27E-01	NOT DETECTED KM 9/16/96
CD-115	Not Detected	---	2.22E+01	
CE-139	Not Detected	---	2.43E-02	
CE-141	Not Detected	---	5.25E-02	
CE-144	Not Detected	---	1.59E-01	
CO-56	Not Detected	---	3.72E-02	
CO-57	Not Detected	---	2.19E-02	
CO-58	Not Detected	---	3.53E-02	
CO-60	Not Detected	---	3.23E-02	
CR-51	Not Detected	---	2.94E-01	
CS-134	Not Detected	---	4.02E-02	
CS-137	Not Detected	---	3.16E-02	
EU-152	Not Detected	---	6.95E-02	
EU-154	Not Detected	---	1.18E-01	
EU-155	Not Detected	---	8.85E-02	
FE-59	Not Detected	---	9.20E-02	
GD-153	Not Detected	---	7.06E-02	
HG-203	Not Detected	---	3.13E-02	
I-131	Not Detected	---	1.18E-01	
IR-192	Not Detected	---	2.69E-02	
K-40	1.26E+01	1.93E+00	2.46E-01	
MN-54	Not Detected	---	3.24E-02	
MO-99	Not Detected	---	2.88E+01	
NA-22	Not Detected	---	4.12E-02	
NA-24	Not Detected	---	5.21E+07	
NB-94	Not Detected	---	2.83E-02	
NB-95	Not Detected	---	4.36E+00	
ND-147	Not Detected	---	5.61E-01	
NI-57	Not Detected	---	3.37E+02	
RU-103	Not Detected	---	3.22E-02	
RU-106	Not Detected	---	2.59E-01	
SB-122	Not Detected	---	4.69E+00	
SB-124	Not Detected	---	3.30E-02	
SB-125	Not Detected	---	6.96E-02	
SR-85	Not Detected	---	3.85E-02	
TA-182	Not Detected	---	1.58E-01	
TA-183	Not Detected	---	1.70E+00	
TC-99m	Not Detected	---	1.00E+26	
TL-201	Not Detected	---	5.20E+00	
XE-133	Not Detected	---	2.99E+01	
Y-88	Not Detected	---	2.95E-02	
ZN-65	Not Detected	---	9.85E-02	
ZR-95	Not Detected	---	6.56E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-09-96 9:30:36 PM

Analyzed by: KAT 9/10/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031194-002
ab Sample ID : 60164503

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 784.000 gram
ample Date/Time : 8-21-96 2:30:00 PM
cquire Start Date/Time : 9-09-96 7:46:48 PM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.19E+00
TH-234	Not Detected	---	4.87E-01
RA-226	1.01E+00	9.68E-01	5.18E-01
PB-214	4.94E-01	1.57E-01	1.76E-01
BI-214	4.66E-01	1.08E-01	4.67E-02
TH-232	6.44E-01	4.90E-01	1.34E-01
RA-228	Not Detected	---	1.41E-01
AC-228	6.24E-01	1.93E-01	8.57E-02
TH-228	Not Detected	---	6.35E-01
RA-224	6.29E-01	2.79E-01	6.08E-02
PB-212	5.74E-01	1.04E-01	3.54E-02
BI-212	Not Detected	---	5.22E-01
TL-208	5.64E-01	1.69E-01	6.74E-02
U-235	Not Detected	---	1.61E-01
TH-231	Not Detected	---	1.61E+00
PA-231	Not Detected	---	1.24E+00
TH-227	Not Detected	---	2.86E-01
RA-223	Not Detected	---	3.54E-01
RN-219	Not Detected	---	3.31E-01
PB-211	Not Detected	---	7.60E-01
TL-207	Not Detected	---	1.37E+01
AM-241	Not Detected	---	1.52E-01
PU-239	Not Detected	---	2.96E+02
NP-237	Not Detected	---	2.27E-01
PA-233	Not Detected	---	5.21E-02
TH-229	Not Detected	---	1.81E-01

[Summary Report] - Sample ID: : 60164503

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	2.98E-02
BA-133	Not Detected	---	3.51E-02
BE-7	Not Detected	---	2.71E-01
CD-109	~~7.03E-01~~	~~4.57E-01~~	4.74E-01
CD-115	Not Detected	---	2.32E+01
CE-139	Not Detected	---	2.55E-02
CE-141	Not Detected	---	5.46E-02
CE-144	Not Detected	---	1.68E-01
CO-56	Not Detected	---	3.86E-02
CO-57	Not Detected	---	2.21E-02
CO-58	Not Detected	---	3.67E-02
CO-60	Not Detected	---	3.43E-02
CR-51	Not Detected	---	3.14E-01
CS-134	Not Detected	---	3.92E-02
CS-137	Not Detected	---	3.23E-02
EU-152	Not Detected	---	7.07E-02
EU-154	Not Detected	---	1.24E-01
EU-155	Not Detected	---	9.30E-02
FE-59	Not Detected	---	8.80E-02
GD-153	Not Detected	---	7.41E-02
HG-203	Not Detected	---	3.42E-02
I-131	Not Detected	---	1.27E-01
IR-192	Not Detected	---	2.92E-02
K-40	1.36E+01	2.11E+00	2.57E-01
MN-54	Not Detected	---	1.43E-02
MO-99	Not Detected	---	3.21E+01
NA-22	Not Detected	---	4.30E-02
NA-24	Not Detected	---	5.28E+07
NB-94	Not Detected	---	3.05E-02
NB-95	Not Detected	---	4.42E+00
ND-147	Not Detected	---	5.83E-01
NI-57	Not Detected	---	3.59E+02
RU-103	Not Detected	---	3.35E-02
RU-106	Not Detected	---	2.78E-01
SB-122	Not Detected	---	5.13E+00
SB-124	Not Detected	---	3.25E-02
SB-125	Not Detected	---	6.92E-02
SR-85	Not Detected	---	4.36E-02
TA-182	Not Detected	---	1.66E-01
TA-183	Not Detected	---	1.77E+00
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	5.35E+00
XE-133	Not Detected	---	3.12E+01
Y-88	Not Detected	---	3.38E-02
ZN-65	Not Detected	---	1.07E-01
ZR-95	Not Detected	---	6.46E-02

NOT DETECTED KAT 9/10/96

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-09-96 11:17:06 PM

Analyzed by: [signature] 9/10/96 Reviewed by: [signature] 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031195-002
ab Sample ID : 60164504

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 774.000 gram
ample Date/Time : 8-21-96 2:45:00 PM
cquire Start Date/Time : 9-09-96 9:33:04 PM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.17E+00
TH-234	Not Detected	---	5.02E-01
RA-226	1.13E+00	4.20E-01	4.93E-01
PB-214	4.69E-01	1.68E-01	1.77E-01
BI-214	4.24E-01	1.06E-01	4.71E-02
TH-232	5.77E-01	1.07E+00	1.25E-01
RA-228	5.87E-01	2.36E-01	1.44E-01
AC-228	6.21E-01	1.82E-01	8.01E-02
TH-228	4.86E-01	3.02E-01	4.15E-01
RA-224	5.87E-01	2.66E-01	8.57E-02
PB-212	5.52E-01	1.01E-01	3.40E-02
BI-212	5.77E-01	2.89E-01	2.98E-01
TL-208	5.60E-01	1.48E-01	6.60E-02
U-235	Not Detected	---	1.62E-01
TH-231	Not Detected	---	1.61E+00
PA-231	Not Detected	---	1.20E+00
TH-227	Not Detected	---	2.85E-01
RA-223	Not Detected	---	3.43E-01
RN-219	Not Detected	---	3.24E-01
PB-211	Not Detected	---	7.59E-01
TL-207	Not Detected	---	1.20E+01
AM-241	Not Detected	---	1.55E-01
PU-239	Not Detected	---	3.06E+02
NP-237	Not Detected	---	2.27E-01
PA-233	Not Detected	---	4.96E-02
TH-229	Not Detected	---	1.75E-01

[Summary Report] - Sample ID: : 60164504

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	2.75E-02
BA-133	Not Detected	---	3.45E-02
BE-7	Not Detected	---	2.86E-01
CD-109	Not Detected	---	8.13E-01
CD-115	Not Detected	---	2.29E+01
CE-139	Not Detected	---	2.47E-02
CE-141	Not Detected	---	5.57E-02
CE-144	Not Detected	---	1.67E-01
CO-56	Not Detected	---	2.94E-02
CO-57	Not Detected	---	2.20E-02
CO-58	Not Detected	---	3.70E-02
CO-60	Not Detected	---	3.67E-02
CR-51	Not Detected	---	3.11E-01
CS-134	Not Detected	---	3.89E-02
CS-137	Not Detected	---	3.15E-02
EU-152	Not Detected	---	7.54E-02
EU-154	Not Detected	---	1.23E-01
EU-155	Not Detected	---	8.87E-02
FE-59	Not Detected	---	9.28E-02
GD-153	Not Detected	---	7.17E-02
HG-203	Not Detected	---	3.29E-02
I-131	Not Detected	---	1.27E-01
IR-192	Not Detected	---	2.80E-02
K-40	1.38E+01	2.30E+00	2.42E-01
MN-54	Not Detected	---	3.66E-02
MO-99	Not Detected	---	3.11E+01
NA-22	Not Detected	---	4.26E-02
NA-24	Not Detected	---	6.28E+07
NB-94	Not Detected	---	3.19E-02
NB-95	Not Detected	---	4.46E+00
ND-147	Not Detected	---	5.83E-01
NI-57	Not Detected	---	3.42E+02
RU-103	Not Detected	---	3.60E-02
RU-106	Not Detected	---	2.68E-01
SB-122	Not Detected	---	5.17E+00
SB-124	Not Detected	---	3.41E-02
SB-125	Not Detected	---	6.78E-02
SR-85	Not Detected	---	4.09E-02
TA-182	Not Detected	---	1.64E-01
TA-183	Not Detected	---	1.81E+00
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	5.53E+00
XE-133	Not Detected	---	3.18E+01
Y-88	Not Detected	---	2.92E-02
ZN-65	Not Detected	---	1.04E-01
ZR-95	Not Detected	---	6.88E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 1:03:41 AM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 031196-002
Lab Sample ID : 60164505

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 869.000 gram
Sample Date/Time : 8-21-96 4:00:00 PM
Acquire Start Date/Time : 9-09-96 11:19:37 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	1.08E+00
TH-234	4.36E-01	2.93E-01	3.89E-01
RA-226	7.92E-01	8.25E-01	5.07E-01
PB-214	3.19E-01	1.51E-01	1.58E-01
BI-214	2.78E-01	1.59E-01	4.39E-02
TH-232	5.47E-01	2.76E-01	1.33E-01
RA-228	5.31E-01	2.71E-01	1.39E-01
AC-228	6.01E-01	4.22E-01	8.44E-02
TH-228	7.23E-01	3.42E-01	4.05E-01
RA-224	5.52E-01	1.98E-01	9.08E-02
PB-212	5.88E-01	2.29E-01	3.13E-02
BI-212	6.66E-01	2.95E-01	2.82E-01
TL-208	5.05E-01	1.83E-01	6.17E-02
U-235	Not Detected	---------	1.55E-01
TH-231	Not Detected	---------	1.50E+00
PA-231	Not Detected	---------	1.11E+00
TH-227	Not Detected	---------	2.71E-01
RA-223	Not Detected	---------	3.25E-01
RN-219	Not Detected	---------	3.20E-01
PB-211	Not Detected	---------	7.20E-01
TL-207	Not Detected	---------	1.36E+01
AM-241	Not Detected	---------	1.41E-01
PU-239	Not Detected	---------	2.80E+02
NP-237	Not Detected	---------	2.15E-01
PA-233	Not Detected	---------	4.62E-02
TH-229	Not Detected	---------	1.72E-01

[Summary Report] - Sample ID: : 60164505

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	2.81E-02
BA-133	Not Detected	---	3.31E-02
BE-7	Not Detected	---	2.65E-01
CD-109	~~7.64E-01~~	~~3.90E-01~~	5.36E-01
CD-115	Not Detected	---	2.21E+01
CE-139	Not Detected	---	2.36E-02
CE-141	Not Detected	---	5.33E-02
CE-144	Not Detected	---	1.61E-01
CO-56	Not Detected	---	3.99E-02
CO-57	Not Detected	---	2.04E-02
CO-58	Not Detected	---	3.50E-02
CO-60	Not Detected	---	3.57E-02
CR-51	Not Detected	---	2.81E-01
CS-134	Not Detected	---	3.31E-02
CS-137	Not Detected	---	3.14E-02
EU-152	Not Detected	---	7.14E-02
EU-154	Not Detected	---	1.22E-01
EU-155	Not Detected	---	8.62E-02
FE-59	Not Detected	---	9.83E-02
GD-153	Not Detected	---	6.90E-02
HG-203	Not Detected	---	3.20E-02
I-131	Not Detected	---	1.17E-01
IR-192	Not Detected	---	2.48E-02
K-40	1.95E+01	2.86E+00	2.33E-01
MN-54	Not Detected	---	3.44E-02
MO-99	Not Detected	---	2.86E+01
NA-22	Not Detected	---	4.25E-02
NA-24	Not Detected	---	5.99E+07
NB-94	Not Detected	---	2.97E-02
NB-95	Not Detected	---	4.20E+00
ND-147	Not Detected	---	5.76E-01
NI-57	Not Detected	---	3.67E+02
RU-103	Not Detected	---	3.21E-02
RU-106	Not Detected	---	2.50E-01
SB-122	Not Detected	---	5.15E+00
SB-124	Not Detected	---	3.18E-02
SB-125	Not Detected	---	6.90E-02
SR-85	Not Detected	---	3.98E-02
TA-182	Not Detected	---	1.58E-01
TA-183	Not Detected	---	1.66E+00
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	5.15E+00
XE-133	Not Detected	---	3.01E+01
Y-88	Not Detected	---	2.65E-02
ZN-65	Not Detected	---	1.02E-01
ZR-95	Not Detected	---	6.67E-02

NOT DETECTED ~~AKT~~ 9/10/96

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 2:50:14 AM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 031197-002
Lab Sample ID : 60164506

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 659.000 gram
Sample Date/Time : 8-26-96 10:30:00 AM
Acquire Start Date/Time : 9-10-96 1:06:09 AM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.47E+00
TH-234	8.41E-01	3.08E-01	4.45E-01
RA-226	1.89E+00	6.31E-01	5.58E-01
PB-214	6.94E-01	3.01E-01	2.09E-01
BI-214	6.90E-01	5.51E-01	5.78E-02
TH-232	6.94E-01	3.48E-01	1.53E-01
RA-228	8.68E-01	2.50E-01	1.76E-01
AC-228	7.07E-01	1.96E-01	9.56E-02
TH-228	7.22E-01	4.21E-01	5.38E-01
RA-224	7.01E-01	2.64E-01	8.21E-02
PB-212	6.97E-01	1.26E-01	4.14E-02
BI-212	Not Detected	---	3.95E-01
TL-208	6.36E-01	1.48E-01	7.61E-02
U-235	Not Detected	---	1.95E-01
TH-231	Not Detected	---	2.01E+00
PA-231	Not Detected	---	1.42E+00
TH-227	Not Detected	---	3.37E-01
RA-223	Not Detected	---	3.27E-01
RN-219	Not Detected	---	4.28E-01
PB-211	Not Detected	---	9.50E-01
TL-207	Not Detected	---	1.65E+01
AM-241	Not Detected	---	1.94E-01
PU-239	Not Detected	---	3.69E+02
NP-237	Not Detected	---	2.85E-01
PA-233	Not Detected	---	5.86E-02
TH-229	Not Detected	---	2.25E-01

[Summary Report] - Sample ID: : 60164506

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	3.33E-02
BA-133	Not Detected	---	4.59E-02
BE-7	Not Detected	---	3.34E-01
CD-109	~~1.37E+00~~	~~4.65E-01~~	7.75E-01
CD-115	Not Detected	---	6.70E+00
CE-139	Not Detected	---	2.94E-02
CE-141	Not Detected	---	6.02E-02
CE-144	Not Detected	---	1.96E-01
CO-56	Not Detected	---	4.80E-02
CO-57	Not Detected	---	2.66E-02
CO-58	Not Detected	---	4.32E-02
CO-60	Not Detected	---	4.42E-02
CR-51	Not Detected	---	3.27E-01
CS-134	Not Detected	---	5.22E-02
CS-137	Not Detected	---	3.94E-02
EU-152	Not Detected	---	8.82E-02
EU-154	Not Detected	---	1.59E-01
EU-155	Not Detected	---	1.08E-01
FE-59	Not Detected	---	1.09E-01
GD-153	Not Detected	---	8.82E-02
HG-203	Not Detected	---	3.59E-02
I-131	Not Detected	---	1.07E-01
IR-192	Not Detected	---	3.25E-02
K-40	1.89E+01	2.89E+00	3.38E-01
MN-54	Not Detected	---	4.27E-02
MO-99	Not Detected	---	1.17E+01
NA-22	Not Detected	---	5.53E-02
NA-24	Not Detected	---	4.49E+05
NB-94	Not Detected	---	3.62E-02
NB-95	Not Detected	---	2.16E+00
ND-147	Not Detected	---	5.27E-01
NI-57	Not Detected	---	5.03E+01
RU-103	Not Detected	---	3.85E-02
RU-106	Not Detected	---	3.33E-01
SB-122	Not Detected	---	1.86E+00
SB-124	Not Detected	---	4.05E-02
SB-125	Not Detected	---	9.27E-02
SR-85	Not Detected	---	4.92E-02
TA-182	Not Detected	---	2.15E-01
TA-183	Not Detected	---	1.21E+00
TC-99m	Not Detected	---	8.80E+15
TL-201	Not Detected	---	2.28E+00
XE-133	Not Detected	---	8.99E+00
Y-88	Not Detected	---	3.77E-02
ZN-65	Not Detected	---	1.33E-01
ZR-95	Not Detected	---	7.69E-02

NOT DETECTED KAT 9/10/96

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 4:35:59 AM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031198-002
ab Sample ID : 60164507

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 741.000 gram
ample Date/Time : 8-26-96 1:40:00 PM
cquire Start Date/Time : 9-10-96 2:52:45 AM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.31E+00
TH-234	6.45E-01	3.55E-01	4.36E-01
RA-226	1.75E+00	6.31E-01	5.57E-01
PB-214	6.54E-01	1.74E-01	1.86E-01
BI-214	5.44E-01	1.13E-01	5.08E-02
TH-232	6.53E-01	3.38E-01	1.41E-01
RA-228	5.82E-01	1.90E-01	1.67E-01
AC-228	6.37E-01	1.73E-01	8.66E-02
TH-228	5.31E-01	3.80E-01	4.56E-01
RA-224	6.83E-01	2.75E-01	8.37E-02
PB-212	6.85E-01	1.32E-01	3.63E-02
BI-212	7.45E-01	4.93E-01	3.04E-01
TL-208	6.53E-01	5.65E-01	6.83E-02
U-235	Not Detected	---	1.78E-01
TH-231	Not Detected	---	1.72E+00
PA-231	Not Detected	---	1.33E+00
TH-227	Not Detected	---	3.14E-01
RA-223	Not Detected	---	2.87E-01
RN-219	Not Detected	---	3.60E-01
PB-211	Not Detected	---	8.27E-01
TL-207	Not Detected	---	1.28E+01
AM-241	Not Detected	---	1.66E-01
PU-239	Not Detected	---	3.36E+02
NP-237	Not Detected	---	2.53E-01
PA-233	Not Detected	---	5.39E-02
TH-229	Not Detected	---	1.94E-01

[Summary Report] - Sample ID: : 60164507

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	3.29E-02
BA-133	Not Detected	---	4.06E-02
BE-7	Not Detected	---	2.86E-01
CD-109	~~9.11E-01~~	~~5.10E-01~~	5.32E-01
CD-115	Not Detected	---	5.86E+00
CE-139	Not Detected	---	2.74E-02
CE-141	Not Detected	---	5.51E-02
CE-144	Not Detected	---	1.77E-01
CO-56	Not Detected	---	4.30E-02
CO-57	Not Detected	---	2.35E-02
CO-58	Not Detected	---	3.78E-02
CO-60	Not Detected	---	3.86E-02
CR-51	Not Detected	---	3.04E-01
CS-134	Not Detected	---	4.36E-02
CS-137	Not Detected	---	3.64E-02
EU-152	Not Detected	---	8.16E-02
EU-154	Not Detected	---	1.31E-01
EU-155	Not Detected	---	9.96E-02
FE-59	Not Detected	---	1.01E-01
GD-153	Not Detected	---	7.47E-02
HG-203	Not Detected	---	3.28E-02
I-131	Not Detected	---	8.93E-02
IR-192	Not Detected	---	2.88E-02
K-40	1.61E+01	2.61E+00	2.53E-01
MN-54	Not Detected	---	1.50E-02
MO-99	Not Detected	---	1.02E+01
NA-22	Not Detected	---	4.55E-02
NA-24	Not Detected	---	3.62E+05
NB-94	Not Detected	---	3.31E-02
NB-95	Not Detected	---	1.94E+00
ND-147	Not Detected	---	4.76E-01
NI-57	Not Detected	---	4.21E+01
RU-103	Not Detected	---	3.32E-02
RU-106	Not Detected	---	3.05E-01
SB-122	Not Detected	---	1.68E+00
SB-124	Not Detected	---	3.61E-02
SB-125	Not Detected	---	7.52E-02
SR-85	Not Detected	---	4.40E-02
TA-182	Not Detected	---	1.82E-01
TA-183	Not Detected	---	1.02E+00
TC-99m	Not Detected	---	6.78E+15
TL-201	Not Detected	---	2.05E+00
XE-133	Not Detected	---	7.81E+00
Y-88	Not Detected	---	3.31E-02
ZN-65	Not Detected	---	1.16E-01
ZR-95	Not Detected	---	7.04E-02

NOT DETECTED KAT 9/16/96

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 6:20:19 AM

Analyzed by: KAT 9/10/96 Reviewed by: [signature] 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031199-002
ab Sample ID : 60164508

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 639.000 gram
ample Date/Time : 8-27-96 8:40:00 AM
cquire Start Date/Time : 9-10-96 4:37:58 AM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	1.32E+00	
TH-234	Not Detected	---	5.66E-01	
RA-226	1.12E+00	4.63E-01	5.29E-01	
PB-214	5.35E-01	1.71E-01	2.14E-01	
BI-214	5.06E-01	4.33E-01	5.37E-02	
TH-232	6.33E-01	3.68E-01	1.50E-01	
RA-228	4.86E-01	2.12E-01	1.69E-01	
AC-228	Not Detected	---	1.05E-01	
TH-228	3.29E-01	2.91E-01	4.25E-01	
RA-224	6.10E-01	2.34E-01	8.56E-02	
PB-212	5.47E-01	1.44E-01	3.59E-02	
BI-212	6.31E-01	4.45E-01	3.47E-01	
TL-208	Not Detected	---	6.89E-02	
U-235	~~1.04E-01~~	~~1.23E-01~~	1.82E-01	NOT DETECTED KAT 9/10/96
TH-231	Not Detected	---	1.81E+00	
PA-231	Not Detected	---	1.37E+00	
TH-227	Not Detected	---	3.13E-01	
RA-223	Not Detected	---	2.88E-01	
RN-219	Not Detected	---	3.67E-01	
PB-211	Not Detected	---	8.20E-01	
TL-207	Not Detected	---	1.43E+01	
AM-241	Not Detected	---	1.69E-01	
PU-239	Not Detected	---	3.31E+02	
NP-237	Not Detected	---	2.59E-01	
PA-233	Not Detected	---	5.62E-02	
TH-229	Not Detected	---	1.99E-01	

[Summary Report] - Sample ID: : 60164508

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	3.13E-02
BA-133	Not Detected	---	4.16E-02
BE-7	Not Detected	---	3.03E-01
CD-109	~~8.32E-01~~	~~4.42E-01~~	~~6.29E-01~~ NOT DETECTED KAT 9/10/96
CD-115	Not Detected	---	4.80E+00
CE-139	Not Detected	---	2.68E-02
CE-141	Not Detected	---	5.52E-02
CE-144	Not Detected	---	1.80E-01
CO-56	Not Detected	---	4.36E-02
CO-57	Not Detected	---	2.33E-02
CO-58	Not Detected	---	3.74E-02
CO-60	Not Detected	---	3.81E-02
CR-51	Not Detected	---	3.13E-01
CS-134	Not Detected	---	4.46E-02
CS-137	Not Detected	---	3.50E-02
EU-152	Not Detected	---	8.42E-02
EU-154	Not Detected	---	1.34E-01
EU-155	Not Detected	---	1.02E-01
FE-59	Not Detected	---	9.79E-02
GD-153	Not Detected	---	7.90E-02
HG-203	Not Detected	---	3.57E-02
I-131	Not Detected	---	8.43E-02
IR-192	Not Detected	---	2.93E-02
K-40	1.26E+01	3.10E+00	3.11E-01
MN-54	Not Detected	---	3.65E-02
MO-99	Not Detected	---	8.86E+00
NA-22	Not Detected	---	4.64E-02
NA-24	Not Detected	---	1.60E+05
NB-94	Not Detected	---	3.34E-02
NB-95	Not Detected	---	1.68E+00
ND-147	Not Detected	---	4.96E-01
NI-57	Not Detected	---	3.27E+01
RU-103	Not Detected	---	3.54E-02
RU-106	Not Detected	---	2.92E-01
SB-122	Not Detected	---	1.50E+00
SB-124	Not Detected	---	3.67E-02
SB-125	Not Detected	---	8.31E-02
SR-85	Not Detected	---	4.66E-02
TA-182	Not Detected	---	1.81E-01
TA-183	Not Detected	---	9.45E-01
TC-99m	Not Detected	---	9.08E+14
TL-201	Not Detected	---	1.74E+00
XE-133	Not Detected	---	6.33E+00
Y-88	Not Detected	---	3.20E-02
ZN-65	Not Detected	---	1.12E-01
ZR-95	Not Detected	---	6.79E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-09-96 10:03:03 PM

Analyzed by: [signature] 9/10/96 Reviewed by: [signature] 9/11/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 031200-002
Lab Sample ID : 60164509

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 790.000 gram
Sample Date/Time : 8-27-96 8:55:00 AM
Acquire Start Date/Time : 9-09-96 8:20:20 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	1.25E+00	
TH-234	6.27E-01	3.55E-01	4.38E-01	
RA-226	1.07E+00	5.65E-01	4.39E-01	
PB-214	4.21E-01	8.71E-02	3.61E-02	
BI-214	3.73E-01	1.73E-01	3.60E-02	
TH-232	5.50E-01	2.90E-01	1.13E-01	
RA-228	Not Detected	---	1.16E-01	
AC-228	5.88E-01	1.73E-01	6.53E-02	
TH-228	4.93E-01	1.78E-01	3.63E-01	
RA-224	5.55E-01	1.75E-01	6.38E-02	
PB-212	5.61E-01	1.05E-01	3.08E-02	
BI-212	6.78E-01	1.03E+00	2.23E-01	
TL-208	5.37E-01	1.18E-01	5.30E-02	
U-235	Not Detected	---	1.91E-01	
TH-231	Not Detected	---	2.13E+00	
PA-231	Not Detected	---	1.17E+00	
TH-227	Not Detected	---	2.89E-01	
RA-223	Not Detected	---	3.17E-01	
RN-219	Not Detected	---	3.11E-01	
PB-211	Not Detected	---	7.26E-01	
TL-207	Not Detected	---	1.10E+01	
AM-241	Not Detected	---	4.53E-01	
PU-239	Not Detected	---	3.70E+02	
NP-237	~~2.02E-01~~	~~1.45E-01~~	2.07E-01	NOT DETECTED [signature] 9/10/96
PA-233	Not Detected	---	4.50E-02	
TH-229	Not Detected	---	2.29E-01	

[Summary Report] - Sample ID: : 60164509

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.25E-02
AG-110m	Not Detected	---------	2.54E-02
BA-133	Not Detected	---------	4.74E-02
BE-7	Not Detected	---------	2.21E-01
CD-109	Not Detected	---------	7.25E-01
CD-115	Not Detected	---------	3.43E+00
CE-139	Not Detected	---------	2.53E-02
CE-141	Not Detected	---------	5.70E-02
CE-144	Not Detected	---------	2.02E-01
CO-56	Not Detected	---------	2.28E-02
CO-57	Not Detected	---------	2.74E-02
CO-58	Not Detected	---------	2.89E-02
CO-60	Not Detected	---------	3.00E-02
CR-51	Not Detected	---------	2.56E-01
CS-134	Not Detected	---------	3.88E-02
CS-137	Not Detected	---------	2.78E-02
EU-152	Not Detected	---------	2.01E-01
EU-154	Not Detected	---------	1.48E-01
EU-155	Not Detected	---------	1.13E-01
FE-59	Not Detected	---------	7.37E-02
GD-153	Not Detected	---------	9.40E-02
HG-203	Not Detected	---------	2.93E-02
I-131	Not Detected	---------	6.87E-02
IR-192	Not Detected	---------	2.49E-02
K-40	1.42E+01	2.88E+00	1.92E-01
MN-52	Not Detected	---------	1.20E-01
MN-54	Not Detected	---------	2.84E-02
MO-99	Not Detected	---------	5.91E+00
NA-22	Not Detected	---------	3.45E-02
NA-24	Not Detected	---------	8.09E+04
NB-95	Not Detected	---------	1.78E+00
ND-147	Not Detected	---------	3.62E-01
NI-57	Not Detected	---------	2.06E+01
RU-103	Not Detected	---------	2.69E-02
RU-106	Not Detected	---------	2.33E-01
SB-122	Not Detected	---------	1.02E+00
SB-124	Not Detected	---------	3.01E-02
SB-125	Not Detected	---------	6.82E-02
SR-85	Not Detected	---------	3.54E-02
TA-182	Not Detected	---------	1.33E-01
TA-183	Not Detected	---------	2.44E+00
TC-99m	Not Detected	---------	3.80E+14
TL-201	Not Detected	---------	2.75E+00
XE-133	Not Detected	---------	6.92E+00
Y-88	Not Detected	---------	2.45E-02
ZN-65	Not Detected	---------	8.53E-02
ZR-95	Not Detected	---------	5.29E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-09-96 11:47:53 PM

Analyzed by: 9/11/96 Reviewed by: 9/11/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 031201-002
Lab Sample ID : 60164510

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 901.000 gram
Sample Date/Time : 8-27-96 11:25:00 AM
Acquire Start Date/Time : 9-09-96 10:05:09 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.57E+00
TH-234	Not Detected	---	5.89E-01
RA-226	5.88E-01	3.40E-01	3.64E-01
PB-214	3.39E-01	6.93E-02	3.52E-02
BI-214	3.21E-01	1.27E-01	3.34E-02
TH-232	5.31E-01	2.63E-01	1.01E-01
RA-228	5.53E-01	1.91E-01	1.27E-01
AC-228	5.67E-01	2.06E-01	6.41E-02
TH-228	4.60E-01	1.73E-01	3.41E-01
RA-224	5.61E-01	1.90E-01	5.05E-02
PB-212	5.62E-01	1.07E-01	2.89E-02
BI-212	6.19E-01	3.44E-01	2.82E-01
TL-208	4.86E-01	9.92E-02	4.77E-02
U-235	Not Detected	---	1.82E-01
TH-231	Not Detected	---	2.08E+00
PA-231	Not Detected	---	1.10E+00
TH-227	Not Detected	---	2.72E-01
RA-223	Not Detected	---	3.09E-01
RN-219	Not Detected	---	2.92E-01
PB-211	Not Detected	---	6.81E-01
TL-207	Not Detected	---	1.10E+01
AM-241	Not Detected	---	4.10E-01
PU-239	Not Detected	---	3.45E+02
NP-237	Not Detected	---	2.93E-01
PA-233	Not Detected	---	4.62E-02
TH-229	Not Detected	---	2.23E-01

[Summary Report] - Sample ID: : 60164510

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.20E-02	
AG-110m	Not Detected	---	2.50E-02	
BA-133	Not Detected	---	4.19E-02	
BE-7	Not Detected	---	2.22E-01	
CD-109	~~6.69E-01~~	~~3.98E-01~~	6.78E-01	NOT DETECTED KAK 9/11/96
CD-115	Not Detected	---	3.11E+00	
CE-139	Not Detected	---	2.44E-02	
CE-141	Not Detected	---	5.36E-02	
CE-144	Not Detected	---	1.92E-01	
CO-56	Not Detected	---	3.06E-02	
CO-57	Not Detected	---	2.59E-02	
CO-58	Not Detected	---	2.85E-02	
CO-60	Not Detected	---	3.05E-02	
CR-51	Not Detected	---	2.46E-01	
CS-134	Not Detected	---	3.45E-02	
CS-137	Not Detected	---	2.71E-02	
EU-152	Not Detected	---	2.02E-01	
EU-154	Not Detected	---	1.45E-01	
EU-155	Not Detected	---	1.09E-01	
FE-59	Not Detected	---	7.65E-02	
GD-153	Not Detected	---	9.10E-02	
HG-203	Not Detected	---	2.73E-02	
I-131	Not Detected	---	6.77E-02	
IR-192	Not Detected	---	2.42E-02	
K-40	1.97E+01	2.75E+00	1.82E-01	
MN-52	Not Detected	---	1.13E-01	
MN-54	~~1.19E-02~~	~~1.22E-02~~	1.72E-02	NOT DETECTED KAK 9/11/96
MO-99	Not Detected	---	5.64E+00	
NA-22	Not Detected	---	3.51E-02	
NA-24	Not Detected	---	7.85E+04	
NB-95	Not Detected	---	1.67E+00	
ND-147	Not Detected	---	3.49E-01	
NI-57	Not Detected	---	1.87E+01	
RU-103	Not Detected	---	2.70E-02	
RU-106	Not Detected	---	2.26E-01	
SB-122	Not Detected	---	9.93E-01	
SB-124	Not Detected	---	2.69E-02	
SB-125	Not Detected	---	6.40E-02	
SR-85	Not Detected	---	3.06E-02	
TA-182	Not Detected	---	1.28E-01	
TA-183	Not Detected	---	2.20E+00	
TC-99m	Not Detected	---	3.25E+14	
TL-201	Not Detected	---	2.56E+00	
XE-133	Not Detected	---	6.62E+00	
Y-88	Not Detected	---	2.08E-02	
ZN-65	Not Detected	---	8.22E-02	
ZR-95	Not Detected	---	5.22E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 1:32:43 AM

Analyzed by: 9/11/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031202-002
ab Sample ID : 60164511

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 777.000 gram
ample Date/Time : 8-27-96 1:50:00 PM
cquire Start Date/Time : 9-09-96 11:50:01 PM
etector Name : LAB02
lapsed Live/Real Time : 6000 / 6003 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	2.90E+00	
TH-234	8.86E-01	4.56E-01	4.72E-01	
RA-226	7.68E-01	5.80E-01	5.06E-01	
PB-214	3.77E-01	7.56E-02	3.92E-02	
BI-214	3.47E-01	7.39E-02	3.84E-02	
TH-232	5.76E-01	2.83E-01	1.19E-01	
RA-228	6.19E-01	2.23E-01	1.25E-01	
AC-228	5.65E-01	1.37E-01	6.92E-02	
TH-228	5.48E-01	1.99E-01	3.83E-01	
RA-224	5.36E-01	1.83E-01	6.48E-02	
PB-212	5.75E-01	9.01E-02	3.40E-02	
BI-212	6.67E-01	3.13E-01	2.37E-01	
TL-208	5.49E-01	1.13E-01	5.28E-02	
U-235	Not Detected	---	1.97E-01	
TH-231	Not Detected	---	2.36E+00	
PA-231	Not Detected	---	1.22E+00	
TH-227	Not Detected	---	2.99E-01	
RA-223	Not Detected	---	3.43E-01	
RN-219	Not Detected	---	3.26E-01	
PB-211	Not Detected	---	7.49E-01	
TL-207	Not Detected	---	1.29E+01	
AM-241	Not Detected	---	4.70E-01	
PU-239	Not Detected	---	3.76E+02	
NP-237	~~3.19E-01~~	~~1.33E-01~~	2.35E-01	NOT DETECTED KK 9/11/96
PA-233	Not Detected	---	5.02E-02	
TH-229	Not Detected	---	2.47E-01	

[Summary Report] - Sample ID: : 60164511

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.41E-02	
AG-110m	Not Detected	---	2.68E-02	
BA-133	Not Detected	---	4.66E-02	
BE-7	Not Detected	---	2.50E-01	
CD-109	Not Detected	---	8.23E-01	
CD-115	Not Detected	---	3.58E+00	
CE-139	Not Detected	---	2.71E-02	
CE-141	Not Detected	---	5.86E-02	
CE-144	Not Detected	---	2.10E-01	
CO-56	Not Detected	---	3.53E-02	
CO-57	Not Detected	---	2.81E-02	
CO-58	Not Detected	---	3.01E-02	
CO-60	Not Detected	---	3.48E-02	
CR-51	Not Detected	---	2.71E-01	
CS-134	Not Detected	---	3.98E-02	
CS-137	Not Detected	---	2.99E-02	
EU-152	Not Detected	---	2.24E-01	
EU-154	Not Detected	---	1.53E-01	
EU-155	Not Detected	---	1.21E-01	
FE-59	Not Detected	---	8.10E-02	
GD-153	Not Detected	---	9.93E-02	
HG-203	Not Detected	---	3.05E-02	
I-131	Not Detected	---	7.23E-02	
IR-192	Not Detected	---	2.69E-02	
K-40	2.08E+01	3.39E+00	2.14E-01	
MN-52	Not Detected	---	1.30E-01	
MN-54	Not Detected	---	3.23E-02	
MO-99	Not Detected	---	6.30E+00	
NA-22	Not Detected	---	3.88E-02	
NA-24	Not Detected	---	8.95E+04	
NB-95	Not Detected	---	1.82E+00	
ND-147	Not Detected	---	3.80E-01	
NI-57	Not Detected	---	2.02E+01	
RU-103	Not Detected	---	2.93E-02	
RU-106	Not Detected	---	2.55E-01	
SB-122	~~1.62E-01~~	~~1.27E-01~~	4.64E-01	NOT DETECTED NOT similar
SB-124	Not Detected	---	3.18E-02	
SB-125	Not Detected	---	7.26E-02	
SR-85	Not Detected	---	3.66E-02	
TA-182	Not Detected	---	1.36E-01	
TA-183	Not Detected	---	2.49E+00	
TC-99m	Not Detected	---	3.31E+14	
TL-201	Not Detected	---	2.88E+00	
XE-133	Not Detected	---	7.38E+00	
Y-88	Not Detected	---	2.17E-02	
ZN-65	Not Detected	---	8.80E-02	
ZR-95	Not Detected	---	6.05E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 3:17:41 AM

Analyzed by: 9/11/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031203-002
ab Sample ID : 60164512

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 764.000 gram
ample Date/Time : 8-27-96 2:00:00 PM
cquire Start Date/Time : 9-10-96 1:34:50 AM
etector Name : LAB02
lapsed Live/Real Time : 6000 / 6003 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	3.24E+00	
TH-234	Not Detected	---	5.25E-01	
RA-226	1.82E+00	7.89E-01	5.54E-01	
PB-214	7.32E-01	2.25E-01	3.98E-02	
BI-214	6.78E-01	1.22E-01	3.96E-02	
TH-232	8.07E-01	6.43E-01	1.26E-01	
RA-228	6.60E-01	1.78E-01	1.31E-01	
AC-228	Not Detected	---	8.26E-02	
TH-228	6.43E-01	2.12E-01	4.40E-01	
RA-224	8.84E-01	2.69E-01	5.45E-02	
PB-212	7.63E-01	1.48E-01	3.68E-02	
BI-212	8.51E-01	3.97E-01	2.98E-01	
TL-208	6.70E-01	2.91E-01	6.04E-02	
U-235	Not Detected	---	2.24E-01	
TH-231	Not Detected	---	2.68E+00	
PA-231	Not Detected	---	1.39E+00	
TH-227	Not Detected	---	3.42E-01	
RA-223	Not Detected	---	3.96E-01	
RN-219	Not Detected	---	3.69E-01	
PB-211	Not Detected	---	8.43E-01	
TL-207	Not Detected	---	1.32E+01	
AM-241	Not Detected	---	5.35E-01	
PU-239	Not Detected	---	4.29E+02	
NP-237	~~3.08E-01~~	~~1.53E-01~~	2.36E-01	NOT DETECTED KAR 9/11/96
PA-233	Not Detected	---	5.59E-02	
TH-229	Not Detected	---	4.43E-01	

[Summary Report] - Sample ID: : 60164512

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.81E-02
AG-110m	Not Detected	---	2.97E-02
BA-133	Not Detected	---	6.02E-02
BE-7	Not Detected	---	2.72E-01
CD-109	Not Detected	---	8.27E-01
CD-115	Not Detected	---	4.01E+00
CE-139	Not Detected	---	3.06E-02
CE-141	Not Detected	---	6.70E-02
CE-144	Not Detected	---	2.33E-01
CO-56	Not Detected	---	3.68E-02
CO-57	Not Detected	---	3.18E-02
CO-58	Not Detected	---	3.31E-02
CO-60	Not Detected	---	3.59E-02
CR-51	Not Detected	---	2.85E-01
CS-134	Not Detected	---	4.95E-02
CS-137	Not Detected	---	3.27E-02
EU-152	Not Detected	---	2.26E-01
EU-154	Not Detected	---	1.72E-01
EU-155	Not Detected	---	1.42E-01
FE-59	Not Detected	---	8.11E-02
GD-153	Not Detected	---	1.75E-01
HG-203	Not Detected	---	3.38E-02
I-131	Not Detected	---	8.15E-02
IR-192	Not Detected	---	2.88E-02
K-40	1.84E+01	2.74E+00	2.09E-01
MN-52	Not Detected	---	1.58E-01
MN-54	Not Detected	---	1.62E-02
MO-99	Not Detected	---	7.22E+00
NA-22	Not Detected	---	4.03E-02
NA-24	Not Detected	---	9.68E+04
NB-95	Not Detected	---	2.11E+00
ND-147	Not Detected	---	4.10E-01
NI-57	Not Detected	---	2.39E+01
RU-103	Not Detected	---	3.20E-02
RU-106	Not Detected	---	2.73E-01
SB-122	Not Detected	---	1.19E+00
SB-124	Not Detected	---	3.38E-02
SB-125	Not Detected	---	7.95E-02
SR-85	Not Detected	---	3.95E-02
TA-182	Not Detected	---	1.56E-01
TA-183	Not Detected	---	2.87E+00
TC-99m	Not Detected	---	4.46E+14
TL-201	Not Detected	---	3.31E+00
XE-133	Not Detected	---	8.69E+00
Y-88	Not Detected	---	2.83E-02
ZN-65	Not Detected	---	1.04E-01
ZR-95	Not Detected	---	6.35E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 5:02:34 AM

Analyzed by: K... 9/11/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031204-002
ab Sample ID : 60164513

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 903.000 gram
ample Date/Time : 8-27-96 3:45:00 PM
cquire Start Date/Time : 9-10-96 3:19:52 AM
etector Name : LAB02
lapsed Live/Real Time : 6000 / 6003 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	2.46E+00	
TH-234	5.55E-01	2.73E-01	3.92E-01	
RA-226	9.95E-01	4.14E-01	3.85E-01	
PB-214	3.72E-01	7.11E-02	3.10E-02	
BI-214	3.43E-01	7.35E-02	3.22E-02	
TH-232	4.66E-01	3.17E-01	9.90E-02	
RA-228	4.80E-01	1.84E-01	1.22E-01	
AC-228	5.70E-01	6.85E-01	5.57E-02	
TH-228	4.62E-01	1.74E-01	3.83E-01	
RA-224	4.86E-01	1.56E-01	4.95E-02	
PB-212	4.88E-01	8.74E-02	2.80E-02	
BI-212	3.63E-01	2.45E-01	2.15E-01	
TL-208	4.47E-01	1.02E-01	4.66E-02	
U-235	~~1.46E-01~~	~~1.35E-01~~	1.74E-01	NOT DETECTED 9/11/96 KAT
TH-231	Not Detected	---	1.92E+00	
PA-231	Not Detected	---	1.03E+00	
TH-227	Not Detected	---	2.55E-01	
RA-223	Not Detected	---	2.88E-01	
RN-219	~~1.27E-01~~	~~2.50E-01~~	2.82E-01	NOT DETECTED 9/11/96 KAT
PB-211	Not Detected	---	6.37E-01	
TL-207	Not Detected	---	1.01E+01	
AM-241	Not Detected	---	3.85E-01	
PU-239	Not Detected	---	3.27E+02	
NP-237	~~1.72E-01~~	~~9.38E-02~~	~~1~~.94E-01	NOT DETECTED KAT 9/11/96
PA-233	Not Detected	---	4.25E-02	
TH-229	Not Detected	---	2.12E-01	

[Summary Report] - Sample ID: : 60164513

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.77E-02
AG-110m	Not Detected	---	2.25E-02
BA-133	Not Detected	---	4.16E-02
BE-7	Not Detected	---	2.00E-01
CD-109	Not Detected	---	6.79E-01
CD-115	Not Detected	---	3.03E+00
CE-139	Not Detected	---	2.26E-02
CE-141	Not Detected	---	5.08E-02
CE-144	Not Detected	---	1.78E-01
CO-56	Not Detected	---	2.74E-02
CO-57	Not Detected	---	2.43E-02
CO-58	Not Detected	---	2.61E-02
CO-60	Not Detected	---	2.67E-02
CR-51	Not Detected	---	2.26E-01
CS-134	Not Detected	---	3.49E-02
CS-137	Not Detected	---	2.54E-02
EU-152	Not Detected	---	1.75E-01
EU-154	Not Detected	---	1.25E-01
EU-155	Not Detected	---	1.02E-01
FE-59	Not Detected	---	6.07E-02
GD-153	Not Detected	---	8.49E-02
HG-203	Not Detected	---	2.49E-02
I-131	Not Detected	---	6.23E-02
IR-192	Not Detected	---	2.21E-02
K-40	1.34E+01	1.94E+00	1.70E-01
MN-52	Not Detected	---	1.10E-01
MN-54	Not Detected	---	2.45E-02
MO-99	Not Detected	---	5.44E+00
NA-22	Not Detected	---	3.05E-02
NA-24	Not Detected	---	7.68E+04
NB-95	Not Detected	---	1.57E+00
ND-147	Not Detected	---	3.09E-01
NI-57	Not Detected	---	1.81E+01
RU-103	Not Detected	---	2.55E-02
RU-106	Not Detected	---	2.12E-01
SB-122	Not Detected	---	9.16E-01
SB-124	Not Detected	---	2.72E-02
SB-125	Not Detected	---	6.23E-02
SR-85	Not Detected	---	3.05E-02
TA-182	Not Detected	---	1.22E-01
TA-183	Not Detected	---	2.07E+00
TC-99m	Not Detected	---	3.48E+14
TL-201	Not Detected	---	2.56E+00
XE-133	Not Detected	---	6.19E+00
Y-88	Not Detected	---	2.15E-02
ZN-65	Not Detected	---	7.94E-02
ZR-95	Not Detected	---	4.62E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 6:47:20 AM

Analyzed by: KW 9/11/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031205-002
ab Sample ID : 60164514

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 920.000 gram
ample Date/Time : 8-27-96 3:55:00 PM
cquire Start Date/Time : 9-10-96 5:04:41 AM
etector Name : LAB02
lapsed Live/Real Time : 6000 / 6003 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.34E+00
TH-234	Not Detected	---	5.40E-01
RA-226	Not Detected	---	4.50E-01
PB-214	4.00E-01	7.49E-02	3.05E-02
BI-214	3.17E-01	6.43E-02	3.26E-02
TH-232	4.78E-01	9.31E-01	9.30E-02
RA-228	3.44E-01	1.21E-01	9.65E-02
AC-228	3.92E-01	9.70E-02	5.99E-02
TH-228	3.74E-01	1.54E-01	3.37E-01
RA-224	4.02E-01	1.45E-01	4.14E-02
PB-212	3.76E-01	7.90E-02	2.68E-02
BI-212	3.36E-01	2.44E-01	2.13E-01
TL-208	3.74E-01	8.74E-02	4.25E-02
U-235	Not Detected	---	1.67E-01
TH-231	Not Detected	---	1.88E+00
PA-231	Not Detected	---	9.93E-01
TH-227	Not Detected	---	2.31E-01
RA-223	Not Detected	---	2.78E-01
RN-219	Not Detected	---	2.57E-01
PB-211	Not Detected	---	6.11E-01
TL-207	Not Detected	---	1.02E+01
AM-241	Not Detected	---	3.73E-01
PU-239	Not Detected	---	3.14E+02
NP-237	Not Detected	---	2.62E-01
PA-233	Not Detected	---	4.16E-02
TH-229	Not Detected	---	2.03E-01

[Summary Report] - Sample ID: : 60164514

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.68E-02
AG-110m	Not Detected	---	2.14E-02
BA-133	Not Detected	---	4.14E-02
BE-7	Not Detected	---	1.92E-01
CD-109	~~5.43E-01~~	~~7.49E-01~~	6.45E-01
CD-115	Not Detected	---	2.83E+00
CE-139	Not Detected	---	2.19E-02
CE-141	Not Detected	---	5.01E-02
CE-144	Not Detected	---	1.71E-01
CO-56	Not Detected	---	1.98E-02
CO-57	Not Detected	---	2.35E-02
CO-58	Not Detected	---	2.43E-02
CO-60	Not Detected	---	2.65E-02
CR-51	Not Detected	---	2.22E-01
CS-134	Not Detected	---	3.27E-02
CS-137	Not Detected	---	2.34E-02
EU-152	Not Detected	---	1.78E-01
EU-154	Not Detected	---	1.22E-01
EU-155	Not Detected	---	9.73E-02
FE-59	Not Detected	---	6.62E-02
GD-153	Not Detected	---	8.41E-02
HG-203	Not Detected	---	2.38E-02
I-131	Not Detected	---	6.23E-02
IR-192	Not Detected	---	2.21E-02
K-40	1.34E+01	1.93E+00	1.86E-01
MN-52	Not Detected	---	1.15E-01
MN-54	Not Detected	---	2.44E-02
MO-99	Not Detected	---	5.22E+00
NA-22	Not Detected	---	2.94E-02
NA-24	Not Detected	---	7.65E+04
NB-95	Not Detected	---	1.44E+00
ND-147	Not Detected	---	3.05E-01
NI-57	Not Detected	---	1.76E+01
RU-103	Not Detected	---	2.34E-02
RU-106	Not Detected	---	2.08E-01
SB-122	Not Detected	---	8.64E-01
SB-124	Not Detected	---	2.54E-02
SB-125	Not Detected	---	5.81E-02
SR-85	Not Detected	---	2.89E-02
TA-182	Not Detected	---	1.13E-01
TA-183	Not Detected	---	2.02E+00
TC-99m	Not Detected	---	3.97E+14
TL-201	Not Detected	---	2.41E+00
XE-133	Not Detected	---	6.27E+00
Y-88	Not Detected	---	1.99E-02
ZN-65	Not Detected	---	7.28E-02
ZR-95	Not Detected	---	4.53E-02

NOT DETECTED KM 9/11/96

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 8:32:44 AM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 031206-002
Lab Sample ID : 60164515

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 856.000 gram
Sample Date/Time : 8-28-96 2:50:00 PM
Acquire Start Date/Time : 9-10-96 6:49:29 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.72E+00
TH-234	5.53E-01	2.62E-01	4.91E-01
RA-226	8.33E-01	4.66E-01	4.46E-01
PB-214	4.49E-01	8.88E-02	3.64E-02
BI-214	4.02E-01	1.35E-01	3.50E-02
TH-232	5.61E-01	3.41E-01	1.08E-01
RA-228	6.30E-01	1.95E-01	1.25E-01
AC-228	6.81E-01	1.53E-01	6.21E-02
TH-228	7.66E-01	2.27E-01	3.66E-01
RA-224	5.84E-01	2.74E-01	6.61E-02
PB-212	6.26E-01	1.37E-01	3.10E-02
BI-212	6.57E-01	2.90E-01	2.28E-01
TL-208	5.61E-01	6.23E-01	5.00E-02
U-235	Not Detected	---	1.96E-01
TH-231	Not Detected	---	2.19E+00
PA-231	Not Detected	---	1.19E+00
TH-227	Not Detected	---	2.94E-01
RA-223	Not Detected	---	3.11E-01
RN-219	Not Detected	---	3.21E-01
PB-211	Not Detected	---	7.39E-01
TL-207	Not Detected	---	1.15E+01
AM-241	Not Detected	---	4.40E-01
PU-239	Not Detected	---	3.72E+02
NP-237	Not Detected	---	2.40E-01
PA-233	Not Detected	---	4.66E-02
TH-229	Not Detected	---	2.40E-01

[Summary Report] - Sample ID: : 60164515

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.18E-02
AG-110m	Not Detected	---	2.51E-02
BA-133	Not Detected	---	4.66E-02
BE-7	Not Detected	---	2.24E-01
CD-109	~~1.63E+00~~	~~9.03E-01~~	8.41E-01
CD-115	Not Detected	---	2.62E+00
CE-139	Not Detected	---	2.54E-02
CE-141	Not Detected	---	5.79E-02
CE-144	Not Detected	---	2.04E-01
CO-56	Not Detected	---	3.25E-02
CO-57	Not Detected	---	2.79E-02
CO-58	Not Detected	---	3.01E-02
CO-60	Not Detected	---	3.22E-02
CR-51	Not Detected	---	2.51E-01
CS-134	Not Detected	---	3.86E-02
CS-137	Not Detected	---	2.80E-02
EU-152	Not Detected	---	2.08E-01
EU-154	Not Detected	---	1.44E-01
EU-155	Not Detected	---	1.14E-01
FE-59	Not Detected	---	7.35E-02
GD-153	Not Detected	---	9.80E-02
HG-203	Not Detected	---	2.86E-02
I-131	Not Detected	---	6.49E-02
IR-192	Not Detected	---	2.45E-02
K-40	1.82E+01	2.61E+00	2.21E-01
MN-52	Not Detected	---	1.27E-01
MN-54	Not Detected	---	3.06E-02
MO-99	Not Detected	---	5.09E+00
NA-22	Not Detected	---	3.36E-02
NA-24	Not Detected	---	3.60E+04
NB-95	Not Detected	---	1.55E+00
ND-147	Not Detected	---	3.46E-01
NI-57	Not Detected	---	1.42E+01
RU-103	Not Detected	---	2.85E-02
RU-106	Not Detected	---	2.38E-01
SB-122	Not Detected	---	8.42E-01
SB-124	Not Detected	---	2.90E-02
SB-125	Not Detected	---	6.89E-02
SR-85	Not Detected	---	3.38E-02
TA-182	Not Detected	---	1.34E-01
TA-183	Not Detected	---	2.12E+00
TC-99m	Not Detected	---	4.13E+13
TL-201	Not Detected	---	2.34E+00
XE-133	Not Detected	---	5.50E+00
Y-88	Not Detected	---	2.07E-02
ZN-65	Not Detected	---	8.70E-02
ZR-95	Not Detected	---	5.50E-02

not detected once 9/10/96

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 9:18:21 AM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031207-002
ab Sample ID : 60164516

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 812.000 gram
ample Date/Time : 8-28-96 3:00:00 PM
cquire Start Date/Time : 9-10-96 7:35:48 AM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.12E+00
TH-234	Not Detected	---	4.98E-01
RA-226	7.05E-01	4.13E-01	4.65E-01
PB-214	3.21E-01	1.47E-01	1.69E-01
BI-214	3.00E-01	9.02E-02	4.61E-02
TH-232	5.62E-01	2.85E-01	1.31E-01
RA-228	5.30E-01	1.98E-01	1.45E-01
AC-228	6.84E-01	1.79E-01	8.06E-02
TH-228	4.56E-01	3.07E-01	4.09E-01
RA-224	5.29E-01	2.26E-01	9.09E-02
PB-212	5.77E-01	1.79E-01	3.33E-02
BI-212	6.69E-01	5.17E-01	2.71E-01
TL-208	6.16E-01	1.38E-01	6.05E-02
U-235	Not Detected	---	1.57E-01
TH-231	Not Detected	---	1.58E+00
PA-231	Not Detected	---	1.20E+00
TH-227	Not Detected	---	2.81E-01
RA-223	Not Detected	---	2.27E-01
RN-219	Not Detected	---	3.29E-01
PB-211	Not Detected	---	7.24E-01
TL-207	Not Detected	---	1.33E+01
AM-241	Not Detected	---	1.49E-01
PU-239	Not Detected	---	2.97E+02
NP-237	Not Detected	---	2.25E-01
PA-233	Not Detected	---	5.00E-02
TH-229	Not Detected	---	1.76E-01

[Summary Report] - Sample ID: : 60164516

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	3.02E-02
BA-133	Not Detected	---	3.44E-02
BE-7	Not Detected	---	2.58E-01
CD-109	Not Detected	---	7.99E-01
CD-115	Not Detected	---	2.87E+00
CE-139	Not Detected	---	2.33E-02
CE-141	Not Detected	---	4.55E-02
CE-144	Not Detected	---	1.67E-01
CO-56	Not Detected	---	3.88E-02
CO-57	Not Detected	---	2.15E-02
CO-58	Not Detected	---	3.36E-02
CO-60	Not Detected	---	3.77E-02
CR-51	Not Detected	---	2.62E-01
CS-134	Not Detected	---	3.56E-02
CS-137	Not Detected	---	3.21E-02
EU-152	Not Detected	---	7.26E-02
EU-154	Not Detected	---	1.23E-01
EU-155	Not Detected	---	9.01E-02
FE-59	Not Detected	---	9.20E-02
GD-153	Not Detected	---	6.98E-02
HG-203	Not Detected	---	2.82E-02
I-131	Not Detected	---	6.95E-02
IR-192	Not Detected	---	2.61E-02
K-40	1.84E+01	2.80E+00	2.50E-01
MN-54	Not Detected	---	3.47E-02
MO-99	Not Detected	---	6.09E+00
NA-22	Not Detected	---	4.27E-02
NA-24	Not Detected	---	4.08E+04
NB-94	Not Detected	---	3.17E-02
NB-95	Not Detected	---	1.23E+00
ND-147	Not Detected	---	3.92E-01
NI-57	Not Detected	---	1.62E+01
RU-103	Not Detected	---	3.06E-02
RU-106	Not Detected	---	2.77E-01
SB-122	Not Detected	---	9.70E-01
SB-124	Not Detected	---	3.29E-02
SB-125	Not Detected	---	7.16E-02
SR-85	Not Detected	---	3.90E-02
TA-182	Not Detected	---	1.58E-01
TA-183	Not Detected	---	7.12E-01
TC-99m	Not Detected	---	3.61E+13
TL-201	Not Detected	---	1.21E+00
XE-133	Not Detected	---	3.86E+00
Y-88	Not Detected	---	2.67E-02
ZN-65	Not Detected	---	1.05E-01
ZR-95	Not Detected	---	6.37E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 11:03:18 AM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031208-002
ab Sample ID : 60164517

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 540.000 gram
ample Date/Time : 8-29-96 9:55:00 AM
cquire Start Date/Time : 9-10-96 9:20:43 AM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	1.83E+00
TH-234	1.04E+00	3.68E-01	5.59E-01
RA-226	3.56E+00	1.19E+00	7.59E-01
PB-214	1.72E+00	3.45E-01	2.57E-01
BI-214	1.53E+00	2.68E-01	7.01E-02
TH-232	8.21E-01	4.33E-01	2.11E-01
RA-228	7.28E-01	3.91E-01	2.46E-01
AC-228	8.73E-01	2.81E-01	1.30E-01
TH-228	6.64E-01	3.92E-01	5.52E-01
RA-224	8.85E-01	3.71E-01	8.76E-02
PB-212	8.50E-01	1.68E-01	5.30E-02
BI-212	6.75E-01	2.99E-01	5.22E-01
TL-208	8.11E-01	1.95E-01	1.05E-01
U-235	~~2.19E-01~~	~~1.77E-01~~	2.60E-01 Not Detected mcc 9/10/96
TH-231	Not Detected	---------	2.42E+00
PA-231	Not Detected	---------	1.97E+00
TH-227	Not Detected	---------	4.38E-01
RA-223	Not Detected	---------	3.44E-01
RN-219	Not Detected	---------	5.43E-01
PB-211	Not Detected	---------	1.26E+00
TL-207	Not Detected	---------	2.11E+01
AM-241	Not Detected	---------	2.44E-01
PU-239	Not Detected	---------	4.66E+02
NP-237	Not Detected	---------	3.67E-01
PA-233	Not Detected	---------	7.82E-02
TH-229	Not Detected	---------	2.82E-01

[Summary Report] - Sample ID: : 60164517

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	4.39E-02
BA-133	Not Detected	---	6.12E-02
BE-7	Not Detected	---	4.01E-01
CD-109	~~2.27E+00~~	~~6.91E-01~~	9.62E-01 NOT Detected mcc 9/10/96
CD-115	Not Detected	---	3.66E+00
CE-139	Not Detected	---	3.77E-02
CE-141	Not Detected	---	7.56E-02
CE-144	Not Detected	---	2.58E-01
CO-56	Not Detected	---	5.83E-02
CO-57	Not Detected	---	3.37E-02
CO-58	Not Detected	---	5.45E-02
CO-60	Not Detected	---	5.43E-02
CR-51	Not Detected	---	4.16E-01
CS-134	Not Detected	---	7.43E-02
CS-137	Not Detected	---	5.25E-02
EU-152	Not Detected	---	1.23E-01
EU-154	Not Detected	---	1.89E-01
EU-155	Not Detected	---	1.40E-01
FE-59	Not Detected	---	1.36E-01
GD-153	Not Detected	---	1.12E-01
HG-203	Not Detected	---	4.78E-02
I-131	Not Detected	---	1.06E-01
IR-192	Not Detected	---	4.05E-02
K-40	2.08E+01	3.31E+00	3.72E-01
MN-54	Not Detected	---	5.04E-02
MO-99	Not Detected	---	7.87E+00
NA-22	Not Detected	---	6.53E-02
NA-24	Not Detected	---	2.93E+04
NB-94	Not Detected	---	4.90E-02
NB-95	Not Detected	---	1.68E+00
ND-147	Not Detected	---	5.63E-01
NI-57	Not Detected	---	2.13E+01
RU-103	Not Detected	---	4.72E-02
RU-106	Not Detected	---	4.08E-01
SB-122	Not Detected	---	1.23E+00
SB-124	Not Detected	---	4.85E-02
SB-125	Not Detected	---	1.21E-01
SR-85	Not Detected	---	5.73E-02
TA-182	Not Detected	---	2.90E-01
TA-183	Not Detected	---	1.06E+00
TC-99m	Not Detected	---	7.70E+12
TL-201	Not Detected	---	1.59E+00
XE-133	Not Detected	---	4.77E+00
Y-88	Not Detected	---	4.35E-02
ZN-65	Not Detected	---	1.87E-01
ZR-95	Not Detected	---	9.61E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 12:50:43 PM

Analyzed by: 9/11/96 Reviewed by: 9/11/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 031209-002
Lab Sample ID : 60164518

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 657.000 gram
Sample Date/Time : 8-29-96 12:50:00 PM
Acquire Start Date/Time : 9-10-96 11:05:45 AM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	8.51E-01
TH-234	1.09E+00	3.60E-01	4.49E-01
RA-226	1.60E+00	7.15E-01	5.36E-01
PB-214	6.52E-01	1.81E-01	2.09E-01
BI-214	6.14E-01	4.25E-01	5.25E-02
TH-232	6.57E-01	3.55E-01	1.51E-01
RA-228	5.78E-01	2.78E-01	1.78E-01
AC-228	7.14E-01	9.71E-01	9.44E-02
TH-228	2.93E-01	2.52E-01	4.54E-01
RA-224	5.69E-01	3.72E-01	1.07E-01
PB-212	6.55E-01	1.20E-01	3.93E-02
BI-212	5.74E-01	6.33E-01	4.13E-01
TL-208	6.34E-01	1.67E-01	7.72E-02
U-235	Not Detected	---	1.90E-01
TH-231	Not Detected	---	1.87E+00
PA-231	Not Detected	---	1.40E+00
TH-227	Not Detected	---	3.34E-01
RA-223	Not Detected	---	2.60E-01
RN-219	Not Detected	---	3.69E-01
PB-211	Not Detected	---	8.40E-01
TL-207	Not Detected	---	1.56E+01
AM-241	Not Detected	---	1.79E-01
PU-239	Not Detected	---	3.44E+02
NP-237	Not Detected	---	2.69E-01
PA-233	Not Detected	---	5.61E-02
TH-229	Not Detected	---	2.05E-01

[Summary Report] - Sample ID: : 60164518

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-110m	Not Detected	---	3.47E-02
BA-133	Not Detected	---	4.07E-02
BE-7	Not Detected	---	2.74E-01
CD-109	~~1.45E+00~~	~~4.60E-01~~	6.94E-01
CD-115	Not Detected	---	2.74E+00
CE-139	Not Detected	---	2.78E-02
CE-141	Not Detected	---	5.50E-02
CE-144	Not Detected	---	1.85E-01
CO-56	Not Detected	---	4.18E-02
CO-57	Not Detected	---	2.43E-02
CO-58	Not Detected	---	3.70E-02
CO-60	Not Detected	---	4.26E-02
CR-51	Not Detected	---	3.04E-01
CS-134	Not Detected	---	4.81E-02
CS-137	Not Detected	---	3.90E-02
EU-152	Not Detected	---	8.33E-02
EU-154	Not Detected	---	1.36E-01
EU-155	Not Detected	---	1.03E-01
FE-59	Not Detected	---	9.87E-02
GD-153	Not Detected	---	8.21E-02
HG-203	Not Detected	---	3.42E-02
I-131	Not Detected	---	7.67E-02
IR-192	Not Detected	---	3.03E-02
K-40	1.31E+01	2.14E+00	3.18E-01
MN-54	Not Detected	---	3.74E-02
MO-99	Not Detected	---	5.79E+00
NA-22	Not Detected	---	4.71E-02
NA-24	Not Detected	---	1.82E+04
NB-94	Not Detected	---	3.47E-02
NB-95	Not Detected	---	1.26E+00
ND-147	Not Detected	---	4.38E-01
NI-57	Not Detected	---	1.26E+01
RU-103	Not Detected	---	3.59E-02
RU-106	Not Detected	---	2.93E-01
SB-122	Not Detected	---	9.31E-01
SB-124	Not Detected	---	3.67E-02
SB-125	Not Detected	---	8.30E-02
SR-85	Not Detected	---	4.56E-02
TA-182	Not Detected	---	1.93E-01
TA-183	Not Detected	---	7.75E-01
TC-99m	Not Detected	---	5.06E+12
TL-201	Not Detected	---	1.16E+00
XE-133	Not Detected	---	3.60E+00
Y-88	Not Detected	---	3.71E-02
ZN-65	Not Detected	---	1.24E-01
ZR-95	Not Detected	---	7.43E-02

NOT DETECTED KAM 9/11/96

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 2:37:17 PM

Analyzed by: [signature] 9/11/96 Reviewed by: [signature] 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031210-002
ab Sample ID : 60164519

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 806.000 gram
ample Date/Time : 8-29-96 1:00:00 PM
cquire Start Date/Time : 9-10-96 12:53:21 PM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.18E+00
TH-234	Not Detected	---	4.03E-01
RA-226	9.46E-01	3.87E-01	4.37E-01
PB-214	3.78E-01	1.34E-01	1.71E-01
BI-214	3.78E-01	1.00E-01	4.64E-02
TH-232	6.09E-01	8.98E-01	1.33E-01
RA-228	5.88E-01	2.40E-01	1.42E-01
AC-228	6.22E-01	1.97E-01	8.85E-02
TH-228	5.39E-01	1.78E-01	3.58E-01
RA-224	5.06E-01	2.69E-01	8.84E-02
PB-212	6.21E-01	1.42E-01	3.35E-02
BI-212	Not Detected	---	5.58E-01
TL-208	6.28E-01	1.57E-01	6.13E-02
U-235	Not Detected	---	1.60E-01
TH-231	Not Detected	---	1.60E+00
PA-231	Not Detected	---	1.21E+00
TH-227	Not Detected	---	2.91E-01
RA-223	Not Detected	---	2.26E-01
RN-219	Not Detected	---	3.22E-01
PB-211	Not Detected	---	7.32E-01
TL-207	Not Detected	---	1.42E+01
AM-241	Not Detected	---	1.55E-01
PU-239	Not Detected	---	3.09E+02
NP-237	Not Detected	---	2.26E-01
PA-233	Not Detected	---	5.10E-02
TH-229	Not Detected	---	1.87E-01

[Summary Report] - Sample ID: : 60164519

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-110m	Not Detected	---	2.97E-02	
BA-133	Not Detected	---	3.49E-02	
BE-7	Not Detected	---	2.67E-01	
CD-109	~~7.46E-01~~	~~3.89E-01~~	5.62E-01	NOT DETECTED KAK 9/11/96
CD-115	Not Detected	---	2.47E+00	
CE-139	Not Detected	---	2.43E-02	
CE-141	Not Detected	---	4.66E-02	
CE-144	Not Detected	---	1.68E-01	
CO-56	Not Detected	---	3.73E-02	
CO-57	Not Detected	---	2.16E-02	
CO-58	Not Detected	---	3.38E-02	
CO-60	Not Detected	---	3.80E-02	
CR-51	Not Detected	---	2.62E-01	
CS-134	Not Detected	---	3.93E-02	
CS-137	4.12E-03	7.99E-03	1.34E-02	
EU-152	Not Detected	---	7.53E-02	
EU-154	Not Detected	---	1.36E-01	
EU-155	Not Detected	---	9.24E-02	
FE-59	Not Detected	---	8.83E-02	
GD-153	Not Detected	---	7.50E-02	
HG-203	Not Detected	---	2.96E-02	
I-131	Not Detected	---	6.63E-02	
IR-192	Not Detected	---	2.65E-02	
K-40	1.92E+01	2.84E+00	2.61E-01	
MN-54	Not Detected	---	3.59E-02	
MO-99	Not Detected	---	5.01E+00	
NA-22	Not Detected	---	4.71E-02	
NA-24	Not Detected	---	1.79E+04	
NB-94	Not Detected	---	3.23E-02	
NB-95	Not Detected	---	1.12E+00	
ND-147	Not Detected	---	3.83E-01	
NI-57	Not Detected	---	1.18E+01	
RU-103	Not Detected	---	3.09E-02	
RU-106	Not Detected	---	2.74E-01	
SB-122	Not Detected	---	8.05E-01	
SB-124	Not Detected	---	3.35E-02	
SB-125	Not Detected	---	7.36E-02	
SR-85	Not Detected	---	3.89E-02	
TA-182	Not Detected	---	1.73E-01	
TA-183	Not Detected	---	6.75E-01	
TC-99m	Not Detected	---	5.26E+12	
TL-201	Not Detected	---	1.05E+00	
XE-133	Not Detected	---	3.22E+00	
Y-88	Not Detected	---	2.46E-02	
ZN-65	Not Detected	---	1.06E-01	
ZR-95	Not Detected	---	6.29E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 10:49:07 AM

Analyzed by: 9/10/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031211-002
ab Sample ID : 60164520

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 716.000 gram
ample Date/Time : 9-04-96 2:15:00 PM
cquire Start Date/Time : 9-10-96 9:05:51 AM
etector Name : LAB02
lapsed Live/Real Time : 6000 / 6003 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.93E+00
TH-234	5.83E-01	3.47E-01	4.35E-01
RA-226	8.37E-01	6.67E-01	5.35E-01
PB-214	3.21E-01	7.99E-02	4.13E-02
BI-214	3.75E-01	8.98E-02	3.59E-02
TH-232	6.02E-01	3.12E-01	1.21E-01
RA-228	5.47E-01	2.23E-01	1.59E-01
AC-228	5.87E-01	1.60E-01	7.28E-02
TH-228	Not Detected	---	3.94E-01
RA-224	5.51E-01	2.03E-01	7.04E-02
PB-212	5.83E-01	1.31E-01	3.43E-02
BI-212	9.00E-01	2.31E-01	2.86E-01
TL-208	5.06E-01	2.72E-01	5.92E-02
U-235	Not Detected	---	2.09E-01
TH-231	Not Detected	---	2.35E+00
PA-231	Not Detected	---	1.30E+00
TH-227	Not Detected	---	3.14E-01
RA-223	Not Detected	---	2.19E-01
RN-219	Not Detected	---	3.43E-01
PB-211	Not Detected	---	7.87E-01
TL-207	Not Detected	---	1.34E+01
AM-241	Not Detected	---	4.69E-01
PU-239	Not Detected	---	3.84E+02
NP-237	Not Detected	---	1.42E-01
PA-233	Not Detected	---	5.27E-02
TH-229	Not Detected	---	2.58E-01

[Summary Report] - Sample ID: : 60164520

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.68E-02	
AG-110m	Not Detected	---	2.63E-02	
BA-133	Not Detected	---	4.69E-02	
BE-7	Not Detected	---	2.35E-01	
CD-109	Not Detected	---	4.91E-01	
CD-115	Not Detected	---	3.45E-01	
CE-139	Not Detected	---	2.73E-02	
CE-141	Not Detected	---	5.27E-02	
CE-144	Not Detected	---	2.13E-01	
CO-56	Not Detected	---	2.07E-02	
CO-57	Not Detected	---	2.87E-02	
CO-58	Not Detected	---	1.37E-02	
CO-60	Not Detected	---	3.49E-02	
CR-51	Not Detected	---	2.38E-01	
CS-134	Not Detected	---	4.05E-02	
CS-137	Not Detected	---	2.96E-02	
EU-152	Not Detected	---	2.33E-01	
EU-154	Not Detected	---	1.65E-01	
EU-155	Not Detected	---	1.25E-01	
FE-59	Not Detected	---	7.40E-02	
GD-153	Not Detected	---	1.02E-01	
HG-203	Not Detected	---	2.74E-02	
I-131	Not Detected	---	3.90E-02	
IR-192	Not Detected	---	2.59E-02	
K-40	2.05E+01	2.90E+00	2.31E-01	
MN-52	Not Detected	---	5.19E-02	
MN-54	Not Detected	---	3.22E-02	
MO-99	Not Detected	---	1.02E+00	
NA-22	Not Detected	---	3.99E-02	
NA-24	Not Detected	---	1.83E+01	
NB-95	Not Detected	---	4.42E-01	
ND-147	Not Detected	---	2.41E-01	
NI-57	~~3.11E-01~~	~~3.44E-01~~	2.97E-01	Not Detected rec 9/10/96
RU-103	Not Detected	---	2.85E-02	
RU-106	Not Detected	---	2.49E-01	
SB-122	Not Detected	---	1.60E-01	
SB-124	Not Detected	---	2.87E-02	
SB-125	Not Detected	---	7.83E-02	
SR-85	Not Detected	---	3.58E-02	
TA-182	Not Detected	---	1.42E-01	
TA-183	Not Detected	---	8.80E-01	
TC-99m	Not Detected	---	2.36E+05	
TL-201	Not Detected	---	5.18E-01	
XE-133	Not Detected	---	6.53E-01	
Y-88	Not Detected	---	2.39E-02	
ZN-65	Not Detected	---	9.20E-02	
ZR-95	Not Detected	---	5.59E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 12:34:34 PM

Analyzed by: 9/11/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031212-002
ab Sample ID : 60164521

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 792.000 gram
ample Date/Time : 9-04-96 2:45:00 PM
cquire Start Date/Time : 9-10-96 10:51:16 AM
etector Name : LAB02
lapsed Live/Real Time : 6000 / 6003 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.69E+00
TH-234	4.33E-01	1.64E-01	4.23E-01
RA-226	7.17E-01	6.72E-01	4.55E-01
PB-214	3.82E-01	8.17E-02	3.66E-02
BI-214	3.67E-01	7.46E-02	3.49E-02
TH-232	6.06E-01	3.29E-01	1.18E-01
RA-228	5.87E-01	3.65E-01	1.27E-01
AC-228	6.55E-01	1.81E-01	7.14E-02
TH-228	4.61E-01	1.59E-01	3.94E-01
RA-224	6.57E-01	2.04E-01	5.88E-02
PB-212	6.02E-01	2.92E-01	3.04E-02
BI-212	5.20E-01	2.29E-01	2.41E-01
TL-208	4.96E-01	1.04E-01	5.45E-02
U-235	Not Detected	---	1.94E-01
TH-231	Not Detected	---	2.27E+00
PA-231	Not Detected	---	1.18E+00
TH-227	Not Detected	---	3.03E-01
RA-223	Not Detected	---	2.11E-01
RN-219	Not Detected	---	3.09E-01
PB-211	Not Detected	---	7.09E-01
TL-207	Not Detected	---	1.19E+01
AM-241	Not Detected	---	4.43E-01
PU-239	Not Detected	---	3.73E+02
NP-237	Not Detected	---	3.16E-01
PA-233	Not Detected	---	4.82E-02
TH-229	Not Detected	---	2.35E-01

[Summary Report] - Sample ID: : 60164521

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.33E-02
AG-110m	Not Detected	---	2.66E-02
BA-133	Not Detected	---	4.65E-02
BE-7	Not Detected	---	2.10E-01
CD-109	Not Detected	---	1.08E+00
CD-115	Not Detected	---	3.33E-01
CE-139	Not Detected	---	2.51E-02
CE-141	Not Detected	---	4.97E-02
CE-144	Not Detected	---	2.02E-01
CO-56	Not Detected	---	3.00E-02
CO-57	Not Detected	---	2.63E-02
CO-58	Not Detected	---	2.74E-02
CO-60	Not Detected	---	3.10E-02
CR-51	Not Detected	---	2.25E-01
CS-134	Not Detected	---	3.78E-02
CS-137	Not Detected	---	2.99E-02
EU-152	Not Detected	---	2.13E-01
EU-154	Not Detected	---	1.50E-01
EU-155	Not Detected	---	1.17E-01
FE-59	Not Detected	---	7.07E-02
GD-153	Not Detected	---	9.32E-02
HG-203	Not Detected	---	2.58E-02
I-131	Not Detected	---	3.87E-02
IR-192	Not Detected	---	2.42E-02
K-40	1.73E+01	2.46E+00	2.46E-01
MN-52	Not Detected	---	5.12E-02
MN-54	~~1.26E-02~~	~~1.13E-02~~	1.52E-02 NOT ~~DETECTED~~ ~~K~~ 가나다
MO-99	Not Detected	---	9.40E-01
NA-22	Not Detected	---	3.59E-02
NA-24	Not Detected	---	1.74E+01
NB-95	Not Detected	---	4.30E-01
ND-147	Not Detected	---	2.34E-01
NI-57	Not Detected	---	5.81E-01
RU-103	Not Detected	---	2.47E-02
RU-106	Not Detected	---	2.41E-01
SB-122	Not Detected	---	1.55E-01
SB-124	Not Detected	---	2.70E-02
SB-125	Not Detected	---	7.00E-02
SR-85	Not Detected	---	3.23E-02
TA-182	Not Detected	---	1.29E-01
TA-183	Not Detected	---	8.42E-01
TC-99m	Not Detected	---	2.47E+05
TL-201	Not Detected	---	4.91E-01
XE-133	Not Detected	---	6.44E-01
Y-88	Not Detected	---	2.22E-02
ZN-65	Not Detected	---	8.40E-02
ZR-95	Not Detected	---	5.09E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 2:19:57 PM

Analyzed by: KM 9/11/96 Reviewed by: [signature] 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : 031213-002
ab Sample ID : 60164522

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 749.000 gram
ample Date/Time : 9-04-96 2:45:00 PM
cquire Start Date/Time : 9-10-96 12:36:42 PM
etector Name : LAB02
lapsed Live/Real Time : 6000 / 6003 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	2.90E+00	
TH-234	8.19E-01	4.94E-01	4.62E-01	
RA-226	1.48E+00	6.50E-01	5.30E-01	
PB-214	5.22E-01	9.43E-02	3.92E-02	
BI-214	5.04E-01	5.26E-01	3.81E-02	
TH-232	5.28E-01	5.84E-01	1.32E-01	
RA-228	6.46E-01	1.99E-01	1.40E-01	
AC-228	5.41E-01	1.66E-01	6.76E-02	
TH-228	5.43E-01	2.04E-01	4.22E-01	
RA-224	6.36E-01	2.02E-01	6.43E-02	
PB-212	6.15E-01	1.14E-01	3.41E-02	
BI-212	5.63E-01	1.93E-01	2.58E-01	
TL-208	5.30E-01	1.28E-01	5.85E-02	
U-235	Not Detected	---	2.06E-01	
TH-231	Not Detected	---	2.42E+00	
PA-231	Not Detected	---	1.26E+00	
TH-227	Not Detected	---	3.12E-01	
RA-223	Not Detected	---	2.22E-01	
RN-219	Not Detected	---	3.40E-01	
PB-211	Not Detected	---	7.71E-01	
TL-207	Not Detected	---	1.22E+01	
AM-241	Not Detected	---	4.69E-01	
PU-239	Not Detected	---	3.88E+02	
NP-237	~~2.00E-01~~	~~1.59E-01~~	2.36E-01	NOT DETECTED KM 9/11/96
PA-233	Not Detected	---	5.21E-02	
TH-229	Not Detected	---	2.51E-01	

[Summary Report] - Sample ID: : 60164522

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.51E-02	
AG-110m	Not Detected	---	2.72E-02	
BA-133	Not Detected	---	5.37E-02	
BE-7	Not Detected	---	2.26E-01	
CD-109	Not Detected	---	8.17E-01	
CD-115	Not Detected	---	3.42E-01	
CE-139	Not Detected	---	2.60E-02	
CE-141	Not Detected	---	5.26E-02	
CE-144	Not Detected	---	2.13E-01	
CO-56	Not Detected	---	3.25E-02	
CO-57	Not Detected	---	2.82E-02	
CO-58	Not Detected	---	2.97E-02	
CO-60	Not Detected	---	3.24E-02	
CR-51	Not Detected	---	2.29E-01	
CS-134	Not Detected	---	4.38E-02	
CS-137	Not Detected	---	3.10E-02	
EU-152	Not Detected	---	2.21E-01	
EU-154	Not Detected	---	1.58E-01	
EU-155	Not Detected	---	1.23E-01	
FE-59	Not Detected	---	7.09E-02	
GD-153	Not Detected	---	1.00E-01	
HG-203	Not Detected	---	2.67E-02	
I-131	Not Detected	---	3.96E-02	
IR-192	Not Detected	---	2.52E-02	
K-40	1.68E+01	2.43E+00	2.25E-01	
MN-52	Not Detected	---	4.89E-02	
MN-54	~~1.37E-02~~	~~1.78E-02~~	1.84E-02	NOT DETECTED KAK 9/11/96
MO-99	Not Detected	---	9.86E-01	
NA-22	Not Detected	---	3.78E-02	
NA-24	Not Detected	---	2.17E+01	
NB-95	Not Detected	---	4.50E-01	
ND-147	Not Detected	---	2.47E-01	
NI-57	Not Detected	---	6.71E-01	
RU-103	Not Detected	---	2.74E-02	
RU-106	Not Detected	---	2.61E-01	
SB-122	Not Detected	---	1.59E-01	
SB-124	Not Detected	---	2.94E-02	
SB-125	Not Detected	---	7.48E-02	
SR-85	Not Detected	---	3.43E-02	
TA-182	Not Detected	---	1.44E-01	
TA-183	Not Detected	---	9.04E-01	
TC-99m	Not Detected	---	3.22E+05	
TL-201	Not Detected	---	5.24E-01	
XE-133	Not Detected	---	7.18E-01	
Y-88	Not Detected	---	2.48E-02	
ZN-65	Not Detected	---	9.32E-02	
ZR-95	Not Detected	---	5.45E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 4:09:46 PM

Analyzed by: 9/11/96 Reviewed by: 9/11/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 031221-002
Lab Sample ID : 60164523

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 835.000 gram
Sample Date/Time : 9-05-96 9:30:00 AM
Acquire Start Date/Time : 9-10-96 2:22:06 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.59E+00
TH-234	2.22E+00	7.95E-01	7.09E-01
RA-226	Not Detected	---	6.68E-01
PB-214	5.08E-01	9.49E-02	4.33E-02
BI-214	4.73E-01	9.45E-02	4.00E-02
TH-232	1.97E+00	8.91E-01	1.40E-01
RA-228	2.19E+00	4.45E-01	1.30E-01
AC-228	2.06E+00	3.72E-01	7.50E-02
TH-228	1.97E+00	5.15E-01	4.68E-01
RA-224	2.01E+00	4.92E-01	7.97E-02
PB-212	1.93E+00	3.23E-01	3.92E-02
BI-212	2.21E+00	5.13E-01	3.08E-01
TL-208	1.77E+00	2.88E-01	6.51E-02
U-235	Not Detected	---	2.55E-01
TH-231	Not Detected	---	2.98E+00
PA-231	Not Detected	---	1.52E+00
TH-227	Not Detected	---	4.78E-01
RA-223	Not Detected	---	2.73E-01
RN-219	Not Detected	---	4.05E-01
PB-211	Not Detected	---	9.64E-01
TL-207	Not Detected	---	1.31E+01
AM-241	Not Detected	---	5.82E-01
PU-239	Not Detected	---	5.02E+02
NP-237	Not Detected	---	4.33E-01
PA-233	Not Detected	---	6.23E-02
TH-229	Not Detected	---	3.06E-01

[Summary Report] - Sample ID: : 60164523

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	4.74E-02	
AG-110m	Not Detected	---	4.42E-02	
BA-133	Not Detected	---	5.46E-02	
BE-7	Not Detected	---	2.80E-01	
CD-109	~~4.04E+00~~	~~1.52E+00~~	1.22E+00	NOT DETECTED KAK 9/11/96
CD-115	Not Detected	---	3.95E-01	
CE-139	Not Detected	---	3.28E-02	
CE-141	Not Detected	---	6.39E-02	
CE-144	Not Detected	---	2.66E-01	
CO-56	Not Detected	---	2.34E-02	
CO-57	Not Detected	---	3.51E-02	
CO-58	Not Detected	---	3.18E-02	
CO-60	Not Detected	---	3.36E-02	
CR-51	Not Detected	---	2.65E-01	
CS-134	Not Detected	---	4.35E-02	
CS-137	1.77E-01	3.20E-01	2.27E-02	
EU-152	Not Detected	---	2.44E-01	
EU-154	Not Detected	---	2.13E-01	
EU-155	Not Detected	---	1.55E-01	
FE-59	Not Detected	---	7.07E-02	
GD-153	Not Detected	---	1.23E-01	
HG-203	Not Detected	---	3.35E-02	
I-131	Not Detected	---	4.52E-02	
IR-192	Not Detected	---	2.95E-02	
K-40	1.54E+01	2.22E+00	2.16E-01	
MN-52	Not Detected	---	5.09E-02	
MN-54	~~4.13E-02~~	~~2.16E-02~~	1.99E-02	NOT DETECTED KAK 9/11/96
MO-99	Not Detected	---	9.16E-01	
NA-22	Not Detected	---	3.58E-02	
NA-24	Not Detected	---	1.02E+01	
NB-95	Not Detected	---	6.00E-01	
ND-147	Not Detected	---	2.79E-01	
NI-57 BI-214	~~3.84E-01~~	~~3.15E-01~~	2.65E-01	NOT DETECTED ~~KAK~~ 9/11/96
RU-103	Not Detected	---	3.13E-02	
RU-106	Not Detected	---	2.96E-01	
SB-122	Not Detected	---	1.57E-01	
SB-124	Not Detected	---	3.27E-02	
SB-125	Not Detected	---	8.79E-02	
SR-85	Not Detected	---	4.29E-02	
TA-182	Not Detected	---	1.34E-01	
TA-183	Not Detected	---	1.01E+00	
TC-99m	Not Detected	---	5.68E+04	
TL-201	Not Detected	---	5.66E-01	
XE-133	Not Detected	---	6.95E-01	
Y-88	Not Detected	---	2.90E-02	
ZN-65	Not Detected	---	8.88E-02	
ZR-95	Not Detected	---	6.64E-02	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 4:41:40 PM

Analyzed by: 9/4/96 Reviewed by: 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SM0)
ustomer Sample ID : LAB CONTROL SAMPLE USING CG134
ab Sample ID : 60164524

ample Description : MIXED_GAMMA_STANDARD_CG134
ample Quantity : 1.000 Each
ample Date/Time : 11-01-90 12:00:00 PM
cquire Start Date/Time : 9-10-96 4:29:15 PM
etector Name : LAB02
lapsed Live/Real Time : 600 / 606 seconds

omments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.29E+04
TH-234	Not Detected	---	4.77E+03
RA-226	Not Detected	---	6.29E+03
PB-214	Not Detected	---	6.44E+02
BI-214	Not Detected	---	6.11E+02
TH-232	Not Detected	---	2.06E+03
RA-228	Not Detected	---	2.79E+03
AC-228	Not Detected	---	1.60E+03
TH-228	Not Detected	---	5.40E+04
RA-224	Not Detected	---	1.26E+03
PB-212	Not Detected	---	4.08E+03
BI-212	Not Detected	---	3.77E+04
TL-208	Not Detected	---	7.52E+03
U-235	Not Detected	---	1.79E+03
TH-231	Not Detected	---	1.74E+04
PA-231	Not Detected	---	1.37E+04
TH-227	Not Detected	---	2.35E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.26E+03
PB-211	Not Detected	---	1.20E+04
TL-207	Not Detected	---	2.19E+05
AM-241	8.93E+04	1.56E+04	3.59E+03
PU-239	Not Detected	---	3.27E+06
NP-237	Not Detected	---	2.52E+03
PA-233	Not Detected	---	5.77E+02
TH-229	Not Detected	---	2.10E+03

[Summary Report] - Sample ID: : 60164524

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.37E+02
AG-110m	Not Detected	---	5.77E+05
BA-133	Not Detected	---	5.61E+02
BE-7	Not Detected	---	3.94E+15
CD-109	3.67E+05	1.24E+05	1.45E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	1.12E+07
CE-141	Not Detected	---	2.66E+22
CE-144	Not Detected	---	3.36E+05
CO-56	Not Detected	---	8.39E+10
CO-57	Not Detected	---	5.87E+04
CO-58	Not Detected	---	4.14E+11
CO-60	7.37E+04	9.81E+03	3.46E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	2.05E+03
CS-137	6.75E+04	9.13E+03	2.71E+02
EU-152	Not Detected	---	3.46E+03
EU-154	Not Detected	---	2.37E+03
EU-155	Not Detected	---	2.45E+03
FE-59	Not Detected	---	2.56E+17
GD-153	Not Detected	---	3.77E+05
HG-203	Not Detected	---	1.73E+16
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.42E+11
K-40	Not Detected	---	1.43E+03
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	4.30E+04
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.08E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
RU-103	Not Detected	---	8.39E+18
RU-106	Not Detected	---	1.59E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	1.44E+13
SB-125	Not Detected	---	4.56E+03
SR-85	Not Detected	---	3.00E+12
TA-182	Not Detected	---	4.99E+08
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	2.08E+08
ZN-65	Not Detected	---	4.02E+05
ZR-95	Not Detected	---	6.49E+12

****

Sandia National Laboratories *
Radiation Protection Sample Diagnostics Program *
Quality Assurance Report *

****

eport Date : 9-10-96 4:42:18 PM
A File : C:\GENIEPC\CAMFILES\LCS2.QAF
nalyst : FCD
ample ID : 60164524
ample Quantity : 1.00 Each
ample Date : 11-01-90 12:00:00 PM
easurement Date : 9-10-96 4:29:15 PM
lapsed Live Time : 600 seconds
lapsed Real Time : 606 seconds

arameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
M-241 Activity	9.257E-02	3.933E-03	8.933E-02	<	:	:	: >
S-137 Activity	6.831E-02	1.990E-03	6.750E-02	<	:	:	: >
O-60 Activity	7.487E-02	1.538E-03	7.371E-02	<	:	:	: >

lags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

eviewed by: _____ 9/11/96

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-10-96 3:40:05 PM

Analyzed by: [signature] 9/11/96 Reviewed by: [signature] 9/11/96

ustomer : M.YOUNG/E.RANKIN (7585/SMO)
ustomer Sample ID : LAB CONTROL SAMPLE USING CG134
ab Sample ID : 60164525

ample Description : MIXED_GAMMA_STANDARD_CG134
ample Quantity : 1.000 Each
ample Date/Time : 11-01-90 12:00:00 PM
cquire Start Date/Time : 9-10-96 3:27:02 PM
etector Name : LAB01
lapsed Live/Real Time : 600 / 605 seconds

omments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	8.31E+03
TH-234	Not Detected	---	3.23E+03
RA-226	Not Detected	---	6.02E+03
PB-214	Not Detected	---	7.05E+02
BI-214	Not Detected	---	7.07E+02
TH-232	Not Detected	---	2.24E+03
RA-228	Not Detected	---	3.26E+03
AC-228	Not Detected	---	1.89E+03
TH-228	Not Detected	---	5.93E+04
RA-224	Not Detected	---	2.17E+03
PB-212	Not Detected	---	4.23E+03
BI-212	Not Detected	---	4.53E+04
TL-208	Not Detected	---	9.14E+03
U-235	Not Detected	---	1.47E+03
TH-231	Not Detected	---	1.19E+04
PA-231	Not Detected	---	1.47E+04
TH-227	Not Detected	---	2.36E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.93E+03
PB-211	Not Detected	---	1.34E+04
TL-207	Not Detected	---	2.54E+05
AM-241	8.93E+04	1.46E+04	1.55E+03
PU-239	Not Detected	---	2.63E+06
NP-237	Not Detected	---	1.76E+03
PA-233	Not Detected	---	6.37E+02
TH-229	Not Detected	---	1.51E+03

[Summary Report] - Sample ID: : 60164525

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-110m	Not Detected	---	6.74E+05
BA-133	Not Detected	---	6.29E+02
BE-7	Not Detected	---	4.47E+15
CD-109	3.24E+05	2.89E+05	1.06E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	1.04E+07
CE-141	Not Detected	---	2.18E+22
CE-144	Not Detected	---	2.59E+05
CO-56	Not Detected	---	1.03E+11
CO-57	Not Detected	---	4.49E+04
CO-58	Not Detected	---	5.06E+11
CO-60	7.27E+04	1.00E+04	4.03E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	2.43E+03
CS-137	6.85E+04	9.11E+03	3.41E+02
EU-152	Not Detected	---	1.33E+03
EU-154	Not Detected	---	1.12E+03
EU-155	Not Detected	---	1.76E+03
FE-59	Not Detected	---	3.01E+17
GD-153	Not Detected	---	2.63E+05
HG-203	Not Detected	---	1.92E+16
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.59E+11
K-40	Not Detected	---	1.61E+03
MN-54	2.51E+04	3.31E+04	2.77E+04
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.14E+03
NA-24	Not Detected	---	1.00E+26
NB-94	Not Detected	---	4.86E+02
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
RU-103	Not Detected	---	9.51E+18
RU-106	Not Detected	---	1.87E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	1.70E+13
SB-125	Not Detected	---	5.19E+03
SR-85	Not Detected	---	3.29E+12
TA-182	Not Detected	---	5.90E+08
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	1.89E+08
ZN-65	Not Detected	---	4.76E+05
ZR-95	Not Detected	---	8.15E+12

****

Sandia National Laboratories *
Radiation Protection Sample Diagnostics Program *
Quality Assurance Report *

****

eport Date : 9-10-96 3:41:14 PM
A File : C:\GENIEPC\CAMFILES\LCS1.QAF
nalyst : FCD
ample ID : 60164525
ample Quantity : 1.00 Each
ample Date : 11-01-90 12:00:00 PM
easurement Date : 9-10-96 3:27:02 PM
lapsed Live Time : 600 seconds
lapsed Real Time : 605 seconds

arameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
M-241 Activity	8.752E-02	5.277E-03	8.935E-02	<	:	:	: >
S-137 Activity	6.877E-02	3.864E-03	6.848E-02	<	:	:	: >
O-60 Activity	7.563E-02	4.899E-03	7.334E-02	<	:	:	: >

lags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

eviewed by: 9/11/96

Feature 58TT

Internal Lab

Batch No. 900530

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SAR/WR No. 3/10/99

AR/COC 601583

Dept. No./Mail Stop:	6134/1148	[redacted]		Contract No.:	AJ-2480A
Project/Task Manager:	Caroline Byrd	[redacted]		Case No.:	7213.220600
Project Name:	Foothill Test Area S1T058	Lab Contact:	Fernando	SMO Authorization:	
Record Center Code:	ER/1333/58/DAT	Lab Destination:	Amir	Bill To: Sandia National Laboratories	
Logbook Ref. No.:		SMO Contact/Phone:	Doug Salmi/844-3110	Supplier Services Dept.:	
Service Order No.	CFO655	Send Report to SMO:	Suzi Jensen	P.O. Box 5800 MS 0154	
Location	NA				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Lab Sample ID
044279-004	S58FB2-GR-001-0-SS	0	58	3999/1100	s	M	500 ml	None	G	SA	Gamma Spec	[redacted]
044280-004	S58FB2-GR-002-0-SS	0	58	3999/1103	s	M	500 ml	None	G	SA	Gamma Spec	
044281-004	S58FB2-GR-003-0-SS	0	58	3999/1107	S	M	500 ml	None	G	SA	Gamma Spec	
044282-004	S58FB2-GR-004-0-SS	0	58	3999/1110	S	M	500 ml	None	G	SA	Gamma Spec	
044283-004	S58FB2-GR-005-0-SS	0	58	3999/1112	S	M	500 ml	None	G	SA	Gamma Spec	
044284-004	S58FB2-GR-006-0-SS	0	58	3999/1115	S	M	500 ml	None	G	SA	Gamma Spec	
044285-004	S58FB2-GR-020-0-SS	0	58	3999/1345	S	M	500 ml	None	G	SA	Gamma Spec	
044286-004	S58FB2-GR-021-0-SS	0	58	3999/1347	S	M	500 ml	None	G	SA	Gamma Spec	
044287-004	S58FB2-GR-022-0-SS	0	58	3999/1349	S	M	500 ml	None	G	SA	Gamma Spec	
044288-004	S58FB2-GR-023-0-SS	0	58	3999/1353	S	M	500 ml	None	G	SA	Gamma Spec	

RMMA ☒ Yes ☐ No Ref. No. [redacted]

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush

Required Report Date VG 3/29/99"

Special Instructions/QC Requirements

EDD ☐ Yes ☐ No

Raw Data Package ☐ Yes ☐ No

This COC releases COC 601584

Please list as separate report.

	Name	Signature	Init	Company/Organization/Phone
Sample Team Members	Chris Catechis	Chris Catechis	C.C.	MDM/6131/235-3841
	Bill Gibson	William J Gibson	WJG	MDM/6131/235-3841
	-			

1.Relinquished by	William J Gibson	Org. 6131	Date 3-10-99	Time 1208	4.Relinquished by	Org. SNO 7577	Date 3/24/99 Time 1228
1. Received by	Suzi Jensen SMO	Org. 7577	Date 3-10-99	Time 1208	4. Received by	Org. 6133	Date 3/24/99 Time 1238
2.Relinquished by	Suzi Jensen SMO	Org. 7577	Date 3-10-99	Time 1216	5.Relinquished by	Org.	Date Time
2. Received by		Org. SNO 7578	Date 3-10-99	Time 1216	5. Received by	Org.	Date Time
3.Relinquished by		Org. 7578	Date 3/11/99	Time 1340	6.Relinquished by	Org.	Date Time
3. Received by	Suzi Jensen SMO	Org. 7577	Date 3-11-99	Time 1340	6. Received by	Org.	Date Time

Analysis Request And Chain Of Custody (Continuation)

#900530

AR/COC- 601583

Project Name:	Foothill Test Area	Project/Task Manger:	Caroline Byrd		Case No. 7213.2							
Location	Tech Area				**Reference LOV (available at SMO)**							Lab use
Building	Room											
Sample No-Fraction	ER Sample ID or Sample Location detail	Depth in Ft	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preser-vative	Sample Collection Methods	Sample Type	**Parameter & Method Requested**	Lab Sample ID
044289-004	S58FB2-GR-024-0-SS	0	58	3999/1356	S	M	500 ml	None	G	SA	Gamma Spec	
044291-004	S58FB2-GR-004-0-SD	0	58	3999/1110	S	M	500 ml	None	G	SA	Gamma Spec	

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134 / MS 1148
Project Location: Foothill Test Area
Phone: 284-2531
Date Results Needed: 3/11/99
Suspect Isotopes: U N/C
Case Number: 7213.220600

Hazards/Special Instructions:
Please Rush!

Batch Log Number: 900530
Logged By: JM

Analysis Type:
- ☐ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass	Remarks / Aliquot Amount
044279-004	Soil	3999/1100	500 ml	Gamma Spec	01 ✓	<300	761g	
044280-004	↓	3999/1103	↓	↓	02 ✓	>300	821g	
044281-004		3999/1107			03 ✓	<300	690g	
044282-004		3999/1110			04 ✓	<300	834g	
044283-004		3999/1112			05 ✓	<300	677g	
044284-004		3999/1115			06 ✓	<300	745g	
044285-004		3999/1345			07 ✓	>300	845g	
044286-004		3999/1347			08 ✓	>300	774g	
044287-004		3999/1349			09 ✓	<300	756g	
044288-004		3999/1353			10 ✓	<300	877g	
044289-004		3999/1356			11 ✓	<300	855g	
044290-004	↓	3999/1110	↓	↓	12 ✓	<300	827g	
LCS	—	1999/2.0	—	γ Spec	13/14	N/A	N/A	

Relinquished by [signature] Date 3-10-99 Received by [signature] Date 3-10-99
Relinquished by [signature] Date 3/11/99 Received by [signature] Date 1340 3-11-99 1340
Relinquished by _____ Date _____ Received by _____ Date _____
Relinquished by _____ Date _____ Received by _____ Date _____

RPSD-0602-02.3

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 3/10/99 3:02:44 PM *
****

* Analyzed by: 3/11/99 Reviewed by: 3/11/99 *

Customer : C. BYRD (6134)
Customer Sample ID : 044279-004
Lab Sample ID : 90053001

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 761.000 gram
Sample Date/Time : 3/09/99 11:00:00 AM
Acquire Start Date/Time : 3/10/99 1:22:27 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6005 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.95E+001	3.02E+001	1.11E+000
RA-226	Not Detected	---	6.86E-001
PB-214	6.87E-001	1.21E+000	4.88E-002
BI-214	6.09E-001	1.39E-001	4.76E-002
PB-210	Not Detected	---	5.61E+001
TH-232	7.23E-001	4.16E-001	1.38E-001
RA-228	8.53E-001	2.55E-001	1.25E-001
AC-228	8.27E-001	2.19E-001	8.65E-002
TH-228	7.97E-001	7.78E-001	5.09E-001
RA-224	8.75E-001	2.14E-001	5.41E-002
PB-212	7.82E-001	1.50E-001	4.49E-002
BI-212	7.68E-001	5.28E-001	3.30E-001
TL-208	7.10E-001	1.78E-001	7.12E-002
U-235	9.05E-001	3.98E-001	2.66E-001
TH-231	Not Detected	---	3.31E+000
PA-231	Not Detected	---	1.62E+000
TH-227	Not Detected	---	3.75E-001
RA-223	Not Detected	---	3.50E-001
RN-219	Not Detected	---	4.05E-001
PB-211	Not Detected	---	9.05E-001
TL-207	Not Detected	---	1.29E+001
AM-241	Not Detected	---	8.51E-001
PU-239	Not Detected	---	5.88E+002
NP-237	Not Detected	---	6.94E-001
PA-233	Not Detected	---	6.46E-002
TH-229	Not Detected	---	5.09E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053001

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.75E-002
AG-110m	Not Detected	---------	3.42E-002
BA-133	Not Detected	---------	5.94E-002
BE-7	Not Detected	---------	2.63E-001
CD-109	Not Detected	---------	2.25E+000
CD-115	Not Detected	---------	9.41E-002
CE-139	Not Detected	---------	4.05E-002
CE-141	Not Detected	---------	7.67E-002
CE-144	Not Detected	---------	3.28E-001
CO-56	Not Detected	---------	3.41E-002
CO-57	Not Detected	---------	4.40E-002
CO-58	Not Detected	---------	3.31E-002
CO-60	Not Detected	---------	3.10E-002
CR-51	Not Detected	---------	2.55E-001
CS-134	Not Detected	---------	3.62E-002
CS-137	4.43E-002	2.93E-002	2.62E-002
EU-152	Not Detected	---------	1.33E-001
EU-154	Not Detected	---------	1.81E-001
EU-155	Not Detected	---------	2.35E-001
FE-59	Not Detected	---------	6.10E-002
GD-153	Not Detected	---------	2.34E-001
HG-203	Not Detected	---------	3.53E-002
I-131	Not Detected	---------	3.43E-002
IR-192	Not Detected	---------	3.04E-002
K-40	1.68E+001	2.46E+000	2.24E-001
MN-52	Not Detected	---------	3.40E-002
MN-54	Not Detected	---------	3.37E-002
MO-99	Not Detected	---------	3.88E-001
NA-22	Not Detected	---------	3.64E-002
NA-24	Not Detected	---------	1.05E-001
NB-95	Not Detected	---------	2.04E-001
ND-147	Not Detected	---------	2.18E-001
NI-57	Not Detected	---------	3.60E-002
RU-103	Not Detected	---------	3.02E-002
RU-106	Not Detected	---------	3.03E-001
SB-122	Not Detected	---------	5.76E-002
SB-124	Not Detected	---------	3.12E-002
SB-125	Not Detected	---------	9.08E-002
SN-113	Not Detected	---------	3.90E-002
SR-85	Not Detected	---------	3.64E-002
TA-182	Not Detected	---------	1.39E-001
TA-183	Not Detected	---------	8.43E-001
TC-99m	Not Detected	---------	8.60E-001
TL-201	Not Detected	---------	4.08E-001
XE-133	Not Detected	---------	3.73E-001
Y-88	Not Detected	---------	2.23E-002
ZN-65	Not Detected	---------	8.95E-002
ZR-95	Not Detected	---------	5.53E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/10/99 4:51:56 PM

Analyzed by: KAT 3/11/99 Reviewed by: [illegible] 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : 044280-004
Lab Sample ID : 90053002

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 821.000 gram
Sample Date/Time : 3/09/99 11:03:00 AM
Acquire Start Date/Time : 3/10/99 3:11:38 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6006 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	8.46E+001	1.21E+001	1.25E+000
RA-226	Not Detected	---	7.87E-001
PB-214	6.99E-001	1.41E-001	5.46E-002
BI-214	6.58E-001	1.39E-001	5.01E-002
PB-210	Not Detected	---	6.45E+001
TH-232	8.65E-001	3.92E-001	1.67E-001
RA-228	9.36E-001	2.80E-001	1.31E-001
AC-228	8.01E-001	1.86E-001	8.53E-002
TH-228	Not Detected	---	5.80E-001
RA-224	9.20E-001	2.22E-001	4.73E-002
PB-212	8.09E-001	1.50E+000	5.05E-002
BI-212	7.13E-001	6.39E-001	3.68E-001
TL-208	7.84E-001	1.89E-001	7.38E-002
U-235	1.25E+000	4.17E-001	2.58E-001
TH-231	Not Detected	---	3.93E+000
PA-231	Not Detected	---	1.77E+000
TH-227	Not Detected	---	3.91E-001
RA-223	~~8.49E-001~~	~~1.96E-001~~	3.95E-001 NOT DETECTED KAT 3/11/99
RN-219	Not Detected	---	4.32E-001
PB-211	Not Detected	---	9.84E-001
TL-207	Not Detected	---	1.30E+001
AM-241	Not Detected	---	9.73E-001
PU-239	Not Detected	---	6.84E+002
NP-237	Not Detected	---	6.46E-001
PA-233	Not Detected	---	7.25E-002
TH-229	Not Detected	---	6.14E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053002

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.79E-002
AG-110m	Not Detected	---	4.26E-002
BA-133	Not Detected	---	6.29E-002
BE-7	Not Detected	---	2.86E-001
CD-109	~~5.56E+000~~	~~1.18E+000~~	2.19E+000 NOT DETECTED KAT 3/11/99
CD-115	Not Detected	---	1.03E-001
CE-139	Not Detected	---	4.78E-002
CE-141	Not Detected	---	8.69E-002
CE-144	Not Detected	---	3.75E-001
CO-56	Not Detected	---	3.39E-002
CO-57	Not Detected	---	5.06E-002
CO-58	Not Detected	---	3.46E-002
CO-60	Not Detected	---	3.14E-002
CR-51	Not Detected	---	2.90E-001
CS-134	Not Detected	---	3.77E-002
CS-137	1.55E-001	5.86E-002	2.33E-002
EU-152	Not Detected	---	1.53E-001
EU-154	Not Detected	---	1.81E-001
EU-155	Not Detected	---	2.73E-001
FE-59	Not Detected	---	6.13E-002
GD-153	Not Detected	---	2.82E-001
HG-203	Not Detected	---	3.86E-002
I-131	Not Detected	---	3.82E-002
IR-192	Not Detected	---	3.42E-002
K-40	1.58E+001	2.27E+000	2.09E-001
MN-52	Not Detected	---	3.30E-002
MN-54	Not Detected	---	3.46E-002
MO-99	Not Detected	---	4.36E-001
NA-22	Not Detected	---	3.27E-002
NA-24	Not Detected	---	1.09E-001
NB-95	Not Detected	---	2.16E-001
ND-147	Not Detected	---	2.48E-001
NI-57	Not Detected	---	7.54E-002
RU-103	Not Detected	---	3.31E-002
RU-106	Not Detected	---	3.14E-001
SB-122	Not Detected	---	6.32E-002
SB-124	Not Detected	---	3.25E-002
SB-125	Not Detected	---	1.03E-001
SN-113	Not Detected	---	4.37E-002
SR-85	Not Detected	---	3.73E-002
TA-182	Not Detected	---	1.33E-001
TA-183	Not Detected	---	9.78E-001
TC-99m	Not Detected	---	1.19E+000
TL-201	Not Detected	---	4.78E-001
XE-133	Not Detected	---	4.57E-001
Y-88	Not Detected	---	2.72E-002
ZN-65	Not Detected	---	8.44E-002
ZR-95	Not Detected	---	6.22E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 3/10/99 6:33:47 PM *
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* Analyzed by: KA 3/11/99 Reviewed by: [signature] 3/11/99 *

Customer : C. BYRD (6134)
Customer Sample ID : 044281-004
Lab Sample ID : 90053003

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 690.000 gram
Sample Date/Time : 3/09/99 11:07:00 AM
Acquire Start Date/Time : 3/10/99 4:53:30 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6005 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	9.30E+001	1.27E+001	1.33E+000	
RA-226	Not Detected	---	7.54E-001	
PB-214	7.09E-001	1.48E-001	5.55E-002	
BI-214	6.36E-001	1.50E-001	5.48E-002	
PB-210	Not Detected	---	6.60E+001	
TH-232	Not Detected	---	1.73E-001	
RA-228	Not Detected	---	1.66E-001	
AC-228	8.23E-001	2.28E-001	8.38E-002	
TH-228	9.16E-001	8.60E-001	5.65E-001	
RA-224	9.57E-001	2.34E-001	5.39E-002	
PB-212	8.07E-001	8.16E-001	5.22E-002	
BI-212	9.04E-001	6.55E-001	3.59E-001	
TL-208	7.99E-001	1.83E-001	8.13E-002	
U-235	1.49E+000	1.12E+000	2.49E-001	
TH-231	Not Detected	---	3.77E+000	
PA-231	Not Detected	---	1.77E+000	
TH-227	Not Detected	---	3.99E-001	
RA-223	~~2.62E-001~~	~~3.95E-001~~	4.31E-001	NOT DETECTED KA 3/11/99
RN-219	Not Detected	---	4.31E-001	
PB-211	Not Detected	---	9.91E-001	
TL-207	Not Detected	---	1.46E+001	
AM-241	Not Detected	---	1.01E+000	
PU-239	Not Detected	---	6.64E+002	
NP-237	Not Detected	---	8.21E-001	
PA-233	Not Detected	---	6.88E-002	
TH-229	Not Detected	---	5.77E-001	

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053003

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.12E-002
AG-110m	Not Detected	---------	3.77E-002
BA-133	Not Detected	---------	6.55E-002
BE-7	Not Detected	---------	2.95E-001
CD-109	Not Detected	---------	2.71E+000
CD-115	Not Detected	---------	1.08E-001
CE-139	Not Detected	---------	4.73E-002
CE-141	Not Detected	---------	8.93E-002
CE-144	Not Detected	---------	3.71E-001
CO-56	Not Detected	---------	3.53E-002
CO-57	Not Detected	---------	4.97E-002
CO-58	Not Detected	---------	3.78E-002
CO-60	Not Detected	---------	3.48E-002
CR-51	Not Detected	---------	2.90E-001
CS-134	Not Detected	---------	4.00E-002
CS-137	Not Detected	---------	2.38E-002
EU-152	Not Detected	---------	1.49E-001
EU-154	Not Detected	---------	1.96E-001
EU-155	Not Detected	---------	2.60E-001
FE-59	Not Detected	---------	6.38E-002
GD-153	Not Detected	---------	2.66E-001
HG-203	Not Detected	---------	3.97E-002
I-131	Not Detected	---------	3.93E-002
IR-192	Not Detected	---------	3.37E-002
K-40	1.68E+001	2.46E+000	2.45E-001
MN-52	Not Detected	---------	2.98E-002
MN-54	Not Detected	---------	2.19E-002
MO-99	Not Detected	---------	4.63E-001
NA-22	Not Detected	---------	3.98E-002
NA-24	Not Detected	---------	1.25E-001
NB-95	Not Detected	---------	2.22E-001
ND-147	Not Detected	---------	2.52E-001
NI-57	Not Detected	---------	4.17E-002
RU-103	Not Detected	---------	3.52E-002
RU-106	Not Detected	---------	3.27E-001
SB-122	Not Detected	---------	6.57E-002
SB-124	Not Detected	---------	3.49E-002
SB-125	Not Detected	---------	1.02E-001
SN-113	Not Detected	---------	4.42E-002
SR-85	Not Detected	---------	4.04E-002
TA-182	Not Detected	---------	1.45E-001
TA-183	Not Detected	---------	1.02E+000
TC-99m	Not Detected	---------	1.41E+000
TL-201	Not Detected	---------	4.83E-001
XE-133	Not Detected	---------	4.64E-001
Y-88	Not Detected	---------	2.95E-002
ZN-65	Not Detected	---------	9.28E-002
ZR-95	Not Detected	---------	6.51E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/10/99 8:15:35 PM

Analyzed by: 3/11/99 Reviewed by: 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : 044282-004
Lab Sample ID : 90053004

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 834.000 gram
Sample Date/Time : 3/09/99 11:10:00 AM
Acquire Start Date/Time : 3/10/99 6:35:21 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	7.86E-001	5.32E-001	5.17E-001
RA-226	1.19E+000	6.29E-001	4.68E-001
PB-214	6.12E-001	1.25E-001	3.61E-002
BI-214	5.67E-001	1.27E-001	3.73E-002
PB-210	Not Detected	---	3.00E+001
TH-232	9.01E-001	4.59E-001	1.15E-001
RA-228	8.18E-001	2.25E-001	1.09E-001
AC-228	7.62E-001	1.91E-001	7.12E-002
TH-228	6.99E-001	9.19E-001	3.53E-001
RA-224	8.51E-001	2.07E-001	5.63E-002
PB-212	7.72E-001	2.05E-001	3.26E-002
BI-212	8.07E-001	5.13E-001	2.30E-001
TL-208	7.02E-001	1.58E-001	5.12E-002
U-235	Not Detected	---	1.93E-001
TH-231	Not Detected	---	1.61E+000
PA-231	Not Detected	---	1.14E+000
TH-227	Not Detected	---	3.18E-001
RA-223	Not Detected	---	1.75E-001
RN-219	Not Detected	---	2.97E-001
PB-211	Not Detected	---	6.67E-001
TL-207	Not Detected	---	1.05E+001
AM-241	Not Detected	---	4.19E-001
PU-239	Not Detected	---	3.54E+002
NP-237	Not Detected	---	2.37E-001
PA-233	Not Detected	---	4.61E-002
TH-229	Not Detected	---	2.25E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053004

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	2.94E-002
AG-110m	Not Detected	---------	2.34E-002
BA-133	Not Detected	---------	4.90E-002
BE-7	Not Detected	---------	1.92E-001
CD-109	~~1.74E+000~~	~~7.92E-001~~	8.06E-001 NOT DETECTED KAT 3/11/99
CD-115	Not Detected	---------	8.38E-002
CE-139	Not Detected	---------	2.50E-002
CE-141	Not Detected	---------	4.28E-002
CE-144	Not Detected	---------	1.93E-001
CO-56	Not Detected	---------	2.55E-002
CO-57	Not Detected	---------	2.53E-002
CO-58	Not Detected	---------	2.52E-002
CO-60	Not Detected	---------	2.85E-002
CR-51	Not Detected	---------	1.86E-001
CS-134	Not Detected	---------	2.86E-002
CS-137	Not Detected	---------	2.50E-002
EU-152	Not Detected	---------	7.64E-002
EU-154	Not Detected	---------	1.45E-001
EU-155	Not Detected	---------	1.24E-001
FE-59	Not Detected	---------	5.44E-002
GD-153	Not Detected	---------	9.49E-002
HG-203	Not Detected	---------	2.54E-002
I-131	Not Detected	---------	2.46E-002
IR-192	Not Detected	---------	2.21E-002
K-40	1.47E+001	2.16E+000	1.95E-001
MN-52	Not Detected	---------	2.72E-002
MN-54	Not Detected	---------	2.71E-002
MO-99	Not Detected	---------	2.45E-001
NA-22	Not Detected	---------	3.27E-002
NA-24	Not Detected	---------	1.10E-001
NB-95	Not Detected	---------	1.76E-001
ND-147	Not Detected	---------	1.58E-001
NI-57	Not Detected	---------	3.16E-002
RU-103	Not Detected	---------	2.15E-002
RU-106	Not Detected	---------	2.12E-001
SB-122	Not Detected	---------	4.26E-002
SB-124	Not Detected	---------	2.34E-002
SB-125	Not Detected	---------	6.71E-002
SN-113	Not Detected	---------	2.86E-002
SR-85	Not Detected	---------	2.91E-002
TA-182	Not Detected	---------	1.20E-001
TA-183	Not Detected	---------	4.33E-001
TC-99m	Not Detected	---------	9.38E-001
TL-201	Not Detected	---------	1.98E-001
XE-133	Not Detected	---------	1.72E-001
Y-88	Not Detected	---------	1.93E-002
ZN-65	Not Detected	---------	7.74E-002
ZR-95	Not Detected	---------	4.66E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/10/99 9:57:24 PM

Analyzed by: 3/11/99 Reviewed by: 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : 044283-004
Lab Sample ID : 90053005

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 677.000 gram
Sample Date/Time : 3/09/99 11:12:00 AM
Acquire Start Date/Time : 3/10/99 8:17:09 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.89E-001
RA-226	1.51E+000	5.00E-001	6.06E-001
PB-214	7.63E-001	1.52E-001	4.30E-002
BI-214	6.72E-001	4.78E-001	4.15E-002
PB-210	Not Detected	---	3.55E+001
TH-232	8.06E-001	4.35E-001	1.46E-001
RA-228	7.93E-001	2.76E-001	1.29E-001
AC-228	8.96E-001	2.44E-001	8.77E-002
TH-228	9.16E-001	6.87E-001	4.91E-001
RA-224	8.83E-001	2.20E-001	6.52E-002
PB-212	8.38E-001	1.57E-001	3.85E-002
BI-212	8.69E-001	5.51E-001	2.65E-001
TL-208	7.61E-001	1.80E-001	6.56E-002
U-235	Not Detected	---	2.20E-001
TH-231	Not Detected	---	1.89E+000
PA-231	Not Detected	---	1.29E+000
TH-227	Not Detected	---	3.65E-001
RA-223	Not Detected	---	2.12E-001
RN-219	Not Detected	---	3.45E-001
PB-211	Not Detected	---	7.55E-001
TL-207	Not Detected	---	1.21E+001
AM-241	Not Detected	---	4.93E-001
PU-239	Not Detected	---	4.06E+002
NP-237	Not Detected	---	2.50E-001
PA-233	Not Detected	---	5.47E-002
TH-229	Not Detected	---	2.55E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053005

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.28E-002
AG-110m	Not Detected	---	2.82E-002
BA-133	Not Detected	---	5.95E-002
BE-7	Not Detected	---	2.23E-001
CD-109	Not Detected	---	8.47E-001
CD-115	Not Detected	---	9.85E-002
CE-139	Not Detected	---	2.86E-002
CE-141	Not Detected	---	4.93E-002
CE-144	Not Detected	---	2.24E-001
CO-56	Not Detected	---	3.04E-002
CO-57	Not Detected	---	2.94E-002
CO-58	Not Detected	---	2.98E-002
CO-60	Not Detected	---	3.29E-002
CR-51	Not Detected	---	2.25E-001
CS-134	Not Detected	---	3.44E-002
CS-137	Not Detected	---	3.07E-002
EU-152	Not Detected	---	8.86E-002
EU-154	Not Detected	---	1.60E-001
EU-155	Not Detected	---	1.43E-001
FE-59	Not Detected	---	6.46E-002
GD-153	Not Detected	---	1.05E-001
HG-203	Not Detected	---	2.90E-002
I-131	Not Detected	---	2.91E-002
IR-192	Not Detected	---	2.61E-002
K-40	1.74E+001	2.58E+000	2.58E-001
MN-52	Not Detected	---	3.11E-002
MN-54	Not Detected	---	1.61E-002
MO-99	Not Detected	---	2.97E-001
NA-22	Not Detected	---	3.90E-002
NA-24	Not Detected	---	1.32E-001
NB-95	Not Detected	---	2.05E-001
ND-147	Not Detected	---	1.90E-001
NI-57	Not Detected	---	9.28E-002
RU-103	Not Detected	---	2.63E-002
RU-106	Not Detected	---	2.64E-001
SB-122	Not Detected	---	5.26E-002
SB-124	Not Detected	---	2.70E-002
SB-125	Not Detected	---	8.01E-002
SN-113	Not Detected	---	3.45E-002
SR-85	Not Detected	---	3.57E-002
TA-182	Not Detected	---	1.43E-001
TA-183	Not Detected	---	5.11E-001
TC-99m	Not Detected	---	1.29E+000
TL-201	Not Detected	---	2.40E-001
XE-133	Not Detected	---	2.15E-001
Y-88	Not Detected	---	2.51E-002
ZN-65	Not Detected	---	9.12E-002
ZR-95	Not Detected	---	5.10E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 3/10/99 11:39:12 PM *
****
* *
* Analyzed by: 3/11/99 Reviewed by: 3/11/99 *
****

Customer : C. BYRD (6134)
Customer Sample ID : 044284-004
Lab Sample ID : 90053006

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 745.000 gram
Sample Date/Time : 3/09/99 11:15:00 AM
Acquire Start Date/Time : 3/10/99 9:58:58 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.17E-001
RA-226	Not Detected	---	5.47E-001
PB-214	7.26E-001	1.45E-001	3.69E-002
BI-214	6.22E-001	1.33E-001	3.83E-002
PB-210	Not Detected	---	3.36E+001
TH-232	8.34E-001	4.28E-001	1.28E-001
RA-228	8.77E-001	2.64E-001	1.14E-001
AC-228	8.05E-001	2.15E-001	7.78E-002
TH-228	8.70E-001	6.43E-001	4.23E-001
RA-224	8.62E-001	2.12E-001	4.98E-002
PB-212	8.05E-001	2.34E-001	3.58E-002
BI-212	9.35E-001	1.10E+000	2.75E-001
TL-208	7.44E-001	2.25E-001	5.57E-002
U-235	Not Detected	---	2.07E-001
TH-231	Not Detected	---	1.79E+000
PA-231	Not Detected	---	1.25E+000
TH-227	Not Detected	---	3.44E-001
RA-223	Not Detected	---	1.91E-001
RN-219	Not Detected	---	3.26E-001
PB-211	Not Detected	---	7.35E-001
TL-207	Not Detected	---	1.14E+001
AM-241	Not Detected	---	4.61E-001
PU-239	Not Detected	---	3.89E+002
NP-237	Not Detected	---	2.54E-001
PA-233	Not Detected	---	4.98E-002
TH-229	Not Detected	---	2.47E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053006

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.19E-002	
AG-110m	Not Detected	---	2.50E-002	
BA-133	Not Detected	---	5.47E-002	
BE-7	Not Detected	---	2.12E-001	
CD-109	~~2.14E+000~~	~~1.53E+000~~	8.61E-001	NOT DETECTED KAT 3/11/99
CD-115	Not Detected	---	9.35E-002	
CE-139	Not Detected	---	2.71E-002	
CE-141	Not Detected	---	4.59E-002	
CE-144	Not Detected	---	2.09E-001	
CO-56	Not Detected	---	3.00E-002	
CO-57	Not Detected	---	2.73E-002	
CO-58	Not Detected	---	2.78E-002	
CO-60	Not Detected	---	3.17E-002	
CR-51	Not Detected	---	2.04E-001	
CS-134	Not Detected	---	3.21E-002	
CS-137	Not Detected	---	2.87E-002	
EU-152	Not Detected	---	8.23E-002	
EU-154	Not Detected	---	1.55E-001	
EU-155	Not Detected	---	1.35E-001	
FE-59	Not Detected	---	5.81E-002	
GD-153	Not Detected	---	1.03E-001	
HG-203	Not Detected	---	2.79E-002	
I-131	Not Detected	---	2.79E-002	
IR-192	Not Detected	---	2.38E-002	
K-40	1.56E+001	2.30E+000	2.23E-001	
MN-52	Not Detected	---	2.99E-002	
MN-54	Not Detected	---	3.01E-002	
MO-99	Not Detected	---	2.90E-001	
NA-22	Not Detected	---	3.56E-002	
NA-24	Not Detected	---	1.23E-001	
NB-95	Not Detected	---	1.96E-001	
ND-147	Not Detected	---	1.80E-001	
NI-57	Not Detected	---	4.41E-002	
RU-103	Not Detected	---	2.43E-002	
RU-106	Not Detected	---	2.41E-001	
SB-122	Not Detected	---	4.78E-002	
SB-124	Not Detected	---	2.54E-002	
SB-125	Not Detected	---	7.17E-002	
SN-113	Not Detected	---	3.18E-002	
SR-85	Not Detected	---	3.22E-002	
TA-182	Not Detected	---	1.33E-001	
TA-183	Not Detected	---	4.78E-001	
TC-99m	Not Detected	---	1.48E+000	
TL-201	Not Detected	---	2.31E-001	
XE-133	Not Detected	---	1.99E-001	
Y-88	Not Detected	---	2.24E-002	
ZN-65	Not Detected	---	8.77E-002	
ZR-95	Not Detected	---	4.94E-002	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/10/99 3:09:15 PM

Analyzed by: KAT 3/11/99 Reviewed by: [illegible] 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : 044285-004
Lab Sample ID : 90053007

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 845.000 gram
Sample Date/Time : 3/09/99 1:45:00 PM
Acquire Start Date/Time : 3/10/99 1:28:37 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6026 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	4.42E+002	5.49E+001	2.28E+000	
RA-226	Not Detected	---	1.59E+000	
PB-214	7.44E-001	2.54E-001	1.24E-001	
BI-214	6.01E-001	2.10E-001	1.17E-001	
PB-210	Not Detected	---	3.34E+001	
TH-232	7.63E-001	7.81E-001	3.26E-001	
RA-228	6.47E-001	3.35E-001	2.21E-001	
AC-228	Not Detected	---	2.64E-001	
TH-228	Not Detected	---	1.74E+000	
RA-224	9.14E-001	3.58E-001	1.09E-001	
PB-212	8.08E-001	2.26E-001	2.03E-001	
BI-212	5.35E-001	5.04E-001	8.15E-001	
TL-208	Not Detected	---	1.64E-001	
U-235	7.03E+000	1.42E+000	5.63E-001	
TH-231	7.80E+000	2.57E+000	5.19E+000	
PA-231	Not Detected	---	3.80E+000	
TH-227	Not Detected	---	5.92E-001	
RA-223	~~2.38E+000~~	~~4.46E-001~~	6.81E-001	NOT DETECTED KAT 3/11/99
RN-219	Not Detected	---	9.10E-001	
PB-211	Not Detected	---	2.04E+000	
TL-207	Not Detected	---	2.47E+001	
AM-241	Not Detected	---	9.90E-001	
PU-239	Not Detected	---	1.33E+003	
NP-237	~~2.56E+000~~	~~5.50E-001~~	1.16E+000	NOT DETECTED KAT 3/11/99
PA-233	Not Detected	---	1.60E-001	
TH-229	Not Detected	---	1.01E+000	

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053007

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	8.25E-002
AG-110m	Not Detected	---------	8.08E-002
BA-133	Not Detected	---------	1.04E-001
BE-7	Not Detected	---------	6.19E-001
BI-207	~~7.23E-002~~	~~6.25E-002~~	4.75E-002 NOT DETECTED KAT 3/11/99
CD-109	Not Detected	---------	4.10E+000
CD-115	Not Detected	---------	1.89E-001
CE-139	Not Detected	---------	9.29E-002
CE-141	Not Detected	---------	1.83E-001
CE-144	Not Detected	---------	7.48E-001
CO-56	Not Detected	---------	6.90E-002
CO-57	Not Detected	---------	9.93E-002
CO-58	Not Detected	---------	7.66E-002
CO-60	Not Detected	---------	4.78E-002
CR-51	Not Detected	---------	6.45E-001
CS-134	Not Detected	---------	7.20E-002
CS-137	1.66E-001	8.39E-002	5.53E-002
EU-152	Not Detected	---------	2.99E-001
EU-154	Not Detected	---------	3.82E-001
EU-155	Not Detected	---------	5.23E-001
FE-59	Not Detected	---------	9.40E-002
GD-153	Not Detected	---------	4.77E-001
HG-203	Not Detected	---------	8.14E-002
I-131	Not Detected	---------	7.89E-002
IR-192	Not Detected	---------	7.47E-002
K-40	1.52E+001	2.51E+000	3.75E-001
MN-52	Not Detected	---------	6.60E-002
MN-54	Not Detected	---------	7.13E-002
MO-99	Not Detected	---------	1.04E+000
NA-22	Not Detected	---------	5.52E-002
NA-24	Not Detected	---------	1.48E-001
NB-95	Not Detected	---------	3.15E-001
ND-147	Not Detected	---------	5.52E-001
NI-57	Not Detected	---------	1.03E-001
RU-103	Not Detected	---------	7.21E-002
RU-106	Not Detected	---------	6.95E-001
SB-122	Not Detected	---------	1.26E-001
SB-124	Not Detected	---------	6.94E-002
SB-125	Not Detected	---------	2.00E-001
SN-113	Not Detected	---------	9.08E-002
SR-85	Not Detected	---------	7.33E-002
TA-182	Not Detected	---------	1.94E-001
TA-183	Not Detected	---------	9.67E-001
TC-99m	Not Detected	---------	1.46E+000
TL-201	Not Detected	---------	6.06E-001
XE-133	Not Detected	---------	6.48E-001
Y-88	Not Detected	---------	6.03E-002
ZN-65	Not Detected	---------	1.25E-001
ZR-95	Not Detected	---------	1.38E-001

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/10/99 4:51:42 PM

Analyzed by: [illegible] 3/11/99 Reviewed by: [illegible] 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : 044286-004
Lab Sample ID : 90053008

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 774.000 gram
Sample Date/Time : 3/09/99 1:47:00 PM
Acquire Start Date/Time : 3/10/99 3:11:04 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6026 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	4.88E+002	6.03E+001	2.44E+000
RA-226	Not Detected	---	1.72E+000
PB-214	Not Detected	---	1.29E-001
BI-214	6.11E-001	2.29E-001	1.33E-001
PB-210	Not Detected	---	3.61E+001
TH-232	7.23E-001	3.97E-001	3.89E-001
RA-228	7.38E-001	3.91E-001	2.68E-001
AC-228	Not Detected	---	2.85E-001
TH-228	Not Detected	---	1.92E+000
RA-224	9.00E-001	2.97E-001	1.28E-001
PB-212	7.03E-001	2.37E-001	2.17E-001
BI-212	1.00E+000	3.86E-001	8.36E-001
TL-208	7.11E-001	2.00E-001	1.79E-001
U-235	7.49E+000	9.79E+000	6.12E-001
TH-231	1.10E+001	4.25E+000	5.53E+000
PA-231	Not Detected	---	4.07E+000
TH-227	Not Detected	---	6.26E-001
RA-223	~~3.03E+000~~	~~5.25E-001~~	7.28E-001 NOT DETECTED KBS 3/11/99
RN-219	Not Detected	---	9.92E-001
PB-211	Not Detected	---	2.20E+000
TL-207	Not Detected	---	1.41E+001
AM-241	Not Detected	---	1.07E+000
PU-239	Not Detected	---	1.43E+003
NP-237	Not Detected	---	1.33E+000
PA-233	Not Detected	---	1.75E-001
TH-229	Not Detected	---	1.11E+000

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053008

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	8.69E-002
AG-110m	Not Detected	---	8.93E-002
BA-133	Not Detected	---	1.13E-001
BE-7	Not Detected	---	6.78E-001
BI-207	Not Detected	---	6.16E-002
CD-109	~~1.09E+001~~	~~2.12E+000~~	4.17E+000 NOT DETECTED KAS 3/4/99
CD-115	Not Detected	---	2.11E-001
CE-139	Not Detected	---	1.01E-001
CE-141	Not Detected	---	1.99E-001
CE-144	Not Detected	---	8.10E-001
CO-56	Not Detected	---	7.41E-002
CO-57	Not Detected	---	1.07E-001
CO-58	Not Detected	---	7.98E-002
CO-60	Not Detected	---	5.27E-002
CR-51	Not Detected	---	7.04E-001
CS-134	Not Detected	---	7.82E-002
CS-137	2.13E-001	1.00E-001	5.87E-002
EU-152	Not Detected	---	3.22E-001
EU-154	Not Detected	---	4.02E-001
EU-155	Not Detected	---	5.67E-001
FE-59	Not Detected	---	9.75E-002
GD-153	Not Detected	---	5.24E-001
HG-203	Not Detected	---	8.82E-002
I-131	Not Detected	---	8.86E-002
IR-192	Not Detected	---	8.21E-002
K-40	1.56E+001	2.50E+000	3.63E-001
MN-52	Not Detected	---	7.30E-002
MN-54	Not Detected	---	7.91E-002
MO-99	Not Detected	---	1.17E+000
NA-22	Not Detected	---	5.63E-002
NA-24	Not Detected	---	1.51E-001
NB-95	Not Detected	---	3.38E-001
ND-147	Not Detected	---	5.94E-001
NI-57	Not Detected	---	1.14E-001
RU-103	Not Detected	---	8.02E-002
RU-106	Not Detected	---	7.60E-001
SB-122	Not Detected	---	1.43E-001
SB-124	Not Detected	---	7.56E-002
SB-125	Not Detected	---	2.20E-001
SN-113	Not Detected	---	1.00E-001
SR-85	Not Detected	---	7.92E-002
TA-182	Not Detected	---	2.13E-001
TA-183	Not Detected	---	1.06E+000
TC-99m	Not Detected	---	1.93E+000
TL-201	Not Detected	---	6.63E-001
XE-133	Not Detected	---	7.11E-001
Y-88	Not Detected	---	7.16E-002
ZN-65	Not Detected	---	1.37E-001
ZR-95	Not Detected	---	1.45E-001

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 3/10/99 6:33:53 PM *
****
*
* Analyzed by: KT 3/11/99 Reviewed by: [illegible] 3/11/99 *
****

Customer : C. BYRD (6134)
Customer Sample ID : 044287-004
Lab Sample ID : 90053009

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 756.000 gram
Sample Date/Time : 3/09/99 1:49:00 PM
Acquire Start Date/Time : 3/10/99 4:53:31 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6010 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	1.80E+002	2.25E+001	1.43E+000	
RA-226	Not Detected	---	1.03E+000	
PB-214	6.50E-001	2.92E-001	8.45E-002	
BI-214	6.57E-001	1.73E-001	9.68E-002	
PB-210	Not Detected	---	2.26E+001	
TH-232	8.32E-001	5.50E-001	2.57E-001	
RA-228	7.44E-001	3.35E-001	2.07E-001	
AC-228	7.94E-001	3.09E-001	1.22E-001	
TH-228	Not Detected	---	8.17E-001	
RA-224	1.01E+000	4.26E-001	1.09E-001	
PB-212	8.40E-001	2.20E-001	2.01E-001	
BI-212	8.28E-001	7.33E-001	5.23E-001	
TL-208	7.49E-001	2.38E-001	1.08E-001	
U-235	2.91E+000	7.71E-001	3.48E-001	
TH-231	4.40E+000	3.22E+000	4.42E+000	
PA-231	Not Detected	---	2.49E+000	
TH-227	Not Detected	---	4.27E-001	
RA-223	~~1.24E+000~~	~~2.43E-001~~	4.07E-001	NOT DETECTED KT 3/11/99
RN-219	Not Detected	---	6.11E-001	
PB-211	Not Detected	---	1.36E+000	
TL-207	Not Detected	---	1.89E+001	
AM-241	Not Detected	---	6.42E-001	
PU-239	Not Detected	---	8.42E+002	
NP-237	Not Detected	---	7.78E-001	
PA-233	Not Detected	---	1.05E-001	
TH-229	Not Detected	---	6.30E-001	

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053009

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	6.12E-002
AG-110m	Not Detected	---	5.93E-002
BA-133	Not Detected	---	7.36E-002
BE-7	Not Detected	---	4.06E-001
BI-207	Not Detected	---	3.54E-002
CD-109	~~3.71E+000~~	~~1.02E+000~~	2.47E+000 NOT DETECTED KA 3/11/99
CD-115	Not Detected	---	1.40E-001
CE-139	Not Detected	---	5.94E-002
CE-141	Not Detected	---	1.18E-001
CE-144	Not Detected	---	4.74E-001
CO-56	Not Detected	---	5.27E-002
CO-57	Not Detected	---	6.22E-002
CO-58	Not Detected	---	5.39E-002
CO-60	Not Detected	---	4.42E-002
CR-51	Not Detected	---	4.24E-001
CS-134	Not Detected	---	5.23E-002
CS-137	8.73E-002	6.21E-002	3.53E-002
EU-152	Not Detected	---	1.88E-001
EU-154	Not Detected	---	2.87E-001
EU-155	Not Detected	---	3.26E-001
FE-59	Not Detected	---	9.18E-002
GD-153	Not Detected	---	2.90E-001
HG-203	Not Detected	---	5.39E-002
I-131	Not Detected	---	5.38E-002
IR-192	Not Detected	---	4.95E-002
K-40	1.62E+001	2.55E+000	3.13E-001
MN-52	Not Detected	---	5.16E-002
MN-54	Not Detected	---	5.46E-002
MO-99	Not Detected	---	7.31E-001
NA-22	Not Detected	---	5.13E-002
NA-24	Not Detected	---	1.50E-001
NB-95	Not Detected	---	2.18E-001
ND-147	Not Detected	---	3.83E-001
NI-57	Not Detected	---	1.09E-001
RU-103	Not Detected	---	4.88E-002
RU-106	Not Detected	---	5.06E-001
SB-122	Not Detected	---	9.28E-002
SB-124	Not Detected	---	4.78E-002
SB-125	Not Detected	---	1.40E-001
SN-113	Not Detected	---	6.32E-002
SR-85	Not Detected	---	5.28E-002
TA-182	Not Detected	---	1.87E-001
TA-183	Not Detected	---	6.40E-001
TC-99m	Not Detected	---	1.35E+000
TL-201	Not Detected	---	4.05E-001
XE-133	Not Detected	---	4.25E-001
Y-88	Not Detected	---	4.53E-002
ZN-65	Not Detected	---	1.25E-001
ZR-95	Not Detected	---	9.77E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/10/99 8:16:01 PM

Analyzed by: KA 3/11/99 Reviewed by: [signature] 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : 044288-004
Lab Sample ID : 90053010

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 877.000 gram
Sample Date/Time : 3/09/99 1:53:00 PM
Acquire Start Date/Time : 3/10/99 6:35:39 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6008 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	4.54E+000	1.30E+000	8.73E-001	
RA-226	7.94E+000	2.35E+000	9.58E-001	
PB-214	3.69E+000	5.43E-001	8.05E-002	
BI-214	3.32E+000	5.06E-001	8.69E-002	
PB-210	Not Detected	---	1.41E+001	
TH-232	4.01E+000	2.16E+000	2.50E-001	
RA-228	4.26E+000	7.70E-001	1.88E-001	
AC-228	4.00E+000	7.51E-001	1.29E-001	
TH-228	3.89E+000	7.62E-001	7.67E-001	
RA-224	5.07E+000	1.31E+000	1.28E-001	
PB-212	4.11E+000	6.66E-001	1.74E-001	
BI-212	4.24E+000	2.94E+000	5.43E-001	
TL-208	3.74E+000	2.15E+000	1.08E-001	
U-235	Not Detected	---	2.43E-001	
TH-231	Not Detected	---	3.78E+000	
PA-231	Not Detected	---	2.20E+000	
TH-227	~~2.18E-001~~	~~9.63E-002~~	~~2.51E-001~~	Not detected KA 3/11/99
RA-223	Not Detected	---	2.38E-001	
RN-219	Not Detected	---	6.25E-001	
PB-211	Not Detected	---	1.39E+000	
TL-207	Not Detected	---	2.05E+001	
AM-241	Not Detected	---	3.64E-001	
PU-239	Not Detected	---	6.57E+002	
NP-237	~~3.05E+000~~	~~5.87E-001~~	4.08E-001	NOT DETECTED KA 3/11/99
PA-233	Not Detected	---	9.38E-002	
TH-229	Not Detected	---	3.00E-001	

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053010

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	6.94E-002
AG-110m	Not Detected	---	4.91E-002
BA-133	Not Detected	---	8.68E-002
BE-7	Not Detected	---	3.90E-001
BI-207	Not Detected	---	4.67E-002
CD-109	Not Detected	---	1.61E+000
CD-115	Not Detected	---	1.85E-001
CE-139	Not Detected	---	4.36E-002
CE-141	Not Detected	---	8.01E-002
CE-144	Not Detected	---	3.48E-001
CO-56	Not Detected	---	4.87E-002
CO-57	Not Detected	---	4.37E-002
CO-58	Not Detected	---	5.02E-002
CO-60	Not Detected	---	5.33E-002
CR-51	Not Detected	---	3.91E-001
CS-134	Not Detected	---	6.30E-002
CS-137	Not Detected	---	5.72E-002
EU-152	Not Detected	---	1.31E-001
EU-154	Not Detected	---	3.36E-001
EU-155	Not Detected	---	1.55E-001
FE-59	Not Detected	---	8.84E-002
GD-153	Not Detected	---	1.19E-001
HG-203	Not Detected	---	5.21E-002
I-131	Not Detected	---	4.93E-002
IR-192	Not Detected	---	4.46E-002
K-40	4.05E+000	1.03E+000	4.06E-001
MN-52	Not Detected	---	5.89E-002
MN-54	Not Detected	---	3.27E-002
MO-99	Not Detected	---	5.27E-001
NA-22	Not Detected	---	5.29E-002
NA-24	Not Detected	---	1.97E-001
NB-95	Not Detected	---	1.46E-001
ND-147	Not Detected	---	3.34E-001
NI-57	Not Detected	---	1.66E-001
RU-103	Not Detected	---	4.35E-002
RU-106	Not Detected	---	4.45E-001
SB-122	Not Detected	---	8.91E-002
SB-124	Not Detected	---	4.65E-002
SB-125	Not Detected	---	1.30E-001
SN-113	Not Detected	---	5.97E-002
SR-85	Not Detected	---	6.20E-002
TA-182	Not Detected	---	2.74E-001
TA-183	Not Detected	---	3.66E-001
TC-99m	Not Detected	---	1.25E+000
TL-201	Not Detected	---	2.25E-001
XE-133	Not Detected	---	2.17E-001
Y-88	Not Detected	---	5.38E-002
ZN-65	Not Detected	---	1.86E-001
ZR-95	Not Detected	---	9.22E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/10/99 9:58:09 PM

Analyzed by: 3/11/99 Reviewed by: 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : 044289-004
Lab Sample ID : 90053011

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 855.000 gram
Sample Date/Time : 3/09/99 1:56:00 PM
Acquire Start Date/Time : 3/10/99 8:17:50 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6008 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	3.97E+000	2.23E+000	7.55E-001
RA-226	7.79E+000	1.92E+000	9.55E-001
PB-214	3.68E+000	5.45E-001	7.97E-002
BI-214	3.28E+000	6.07E-001	8.50E-002
PB-210	Not Detected	---	1.45E+001
TH-232	3.94E+000	2.28E+000	2.59E-001
RA-228	4.03E+000	7.45E-001	2.11E-001
AC-228	3.99E+000	7.03E-001	1.32E-001
TH-228	3.59E+000	7.26E-001	7.99E-001
RA-224	5.15E+000	1.32E+000	1.39E-001
PB-212	4.16E+000	1.09E+000	1.80E-001
BI-212	4.34E+000	1.20E+000	5.30E-001
TL-208	3.77E+000	4.13E+000	1.08E-001
U-235	Not Detected	---	2.21E-001
TH-231	Not Detected	---	3.82E+000
PA-231	Not Detected	---	2.28E+000
TH-227	Not Detected	---	5.97E-001
RA-223	Not Detected	---	2.41E-001
RN-219	Not Detected	---	6.07E-001
PB-211	Not Detected	---	1.38E+000
TL-207	Not Detected	---	2.09E+001
AM-241	Not Detected	---	3.67E-001
PU-239	Not Detected	---	6.66E+002
NP-237	Not Detected	---	4.87E-001
PA-233	Not Detected	---	9.64E-002
TH-229	Not Detected	---	3.07E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053011

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	6.90E-002
AG-110m	Not Detected	---------	5.05E-002
BA-133	Not Detected	---------	8.86E-002
BE-7	Not Detected	---------	3.87E-001
BI-207	Not Detected	---------	4.70E-002
CD-109	Not Detected	---------	1.64E+000
CD-115	Not Detected	---------	1.90E-001
CE-139	Not Detected	---------	4.39E-002
CE-141	Not Detected	---------	8.03E-002
CE-144	Not Detected	---------	3.56E-001
CO-56	Not Detected	---------	4.77E-002
CO-57	Not Detected	---------	4.44E-002
CO-58	Not Detected	---------	5.09E-002
CO-60	Not Detected	---------	5.32E-002
CR-51	Not Detected	---------	3.94E-001
CS-134	Not Detected	---------	6.16E-002
CS-137	Not Detected	---------	5.76E-002
EU-152	Not Detected	---------	1.33E-001
EU-154	Not Detected	---------	3.38E-001
EU-155	~~3.49E-001~~	~~2.91E-001~~	1.52E-001 NOT DETECTED KAT 3/11/99
FE-59	Not Detected	---------	9.01E-002
GD-153	Not Detected	---------	1.22E-001
HG-203	Not Detected	---------	5.35E-002
I-131	Not Detected	---------	5.13E-002
IR-192	Not Detected	---------	4.53E-002
K-40	4.19E+000	1.07E+000	4.35E-001
MN-52	Not Detected	---------	6.60E-002
MN-54	Not Detected	---------	3.74E-002
MO-99	Not Detected	---------	5.27E-001
NA-22	Not Detected	---------	5.52E-002
NA-24	Not Detected	---------	2.31E-001
NB-95	Not Detected	---------	2.58E-001
ND-147	Not Detected	---------	3.51E-001
NI-57	Not Detected	---------	1.75E-001
RU-103	Not Detected	---------	4.39E-002
RU-106	Not Detected	---------	4.72E-001
SB-122	Not Detected	---------	8.98E-002
SB-124	Not Detected	---------	4.60E-002
SB-125	Not Detected	---------	1.29E-001
SN-113	Not Detected	---------	6.17E-002
SR-85	Not Detected	---------	6.28E-002
TA-182	Not Detected	---------	2.81E-001
TA-183	Not Detected	---------	3.73E-001
TC-99m	Not Detected	---------	1.51E+000
TL-201	Not Detected	---------	2.30E-001
XE-133	Not Detected	---------	2.25E-001
Y-88	Not Detected	---------	5.93E-002
ZN-65	Not Detected	---------	1.89E-001
ZR-95	Not Detected	---------	9.32E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/10/99 11:40:10 PM

Analyzed by: [signature] 3/11/99 Reviewed by: [signature] 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : 044291-004
Lab Sample ID : 90053012

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 827.000 gram
Sample Date/Time : 3/09/99 11:10:00 AM
Acquire Start Date/Time : 3/10/99 9:59:58 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.98E-001
RA-226	1.49E+000	7.48E-001	5.40E-001
PB-214	5.72E-001	5.18E-001	4.38E-002
BI-214	5.50E-001	1.33E-001	6.69E-002
PB-210	Not Detected	---	7.67E+000
TH-232	7.63E-001	4.04E-001	1.43E-001
RA-228	7.97E-001	3.08E-001	1.51E-001
AC-228	6.96E-001	2.23E-001	8.35E-002
TH-228	7.60E-001	2.90E-001	4.53E-001
RA-224	8.61E-001	3.54E-001	8.85E-002
PB-212	7.86E-001	1.83E-001	1.77E-001
BI-212	7.45E-001	5.09E-001	3.20E-001
TL-208	7.22E-001	4.32E-001	6.50E-002
U-235	1.34E-001	1.63E-001	1.91E-001
TH-231	Not Detected	---	1.99E+000
PA-231	Not Detected	---	1.23E+000
TH-227	Not Detected	---	2.86E-001
RA-223	Not Detected	---	1.24E-001
RN-219	Not Detected	---	3.32E-001
PB-211	Not Detected	---	7.68E-001
TL-207	Not Detected	---	1.23E+001
AM-241	Not Detected	---	1.86E-001
PU-239	Not Detected	---	3.36E+002
NP-237	Not Detected	---	2.35E-001
PA-233	Not Detected	---	5.19E-002
TH-229	Not Detected	---	1.58E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90053012

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.99E-002
AG-110m	Not Detected	---	2.79E-002
BA-133	Not Detected	---	4.26E-002
BE-7	Not Detected	---	2.24E-001
BI-207	Not Detected	---	2.70E-002
CD-109	Not Detected	---	7.80E-001
CD-115	Not Detected	---	1.01E-001
CE-139	Not Detected	---	2.39E-002
CE-141	Not Detected	---	4.18E-002
CE-144	Not Detected	---	1.82E-001
CO-56	Not Detected	---	3.24E-002
CO-57	Not Detected	---	2.33E-002
CO-58	Not Detected	---	3.08E-002
CO-60	Not Detected	---	3.77E-002
CR-51	Not Detected	---	2.15E-001
CS-134	Not Detected	---	3.34E-002
CS-137	Not Detected	---	3.08E-002
EU-152	Not Detected	---	6.97E-002
EU-154	Not Detected	---	1.89E-001
EU-155	Not Detected	---	1.08E-001
FE-59	Not Detected	---	7.40E-002
GD-153	Not Detected	---	6.32E-002
HG-203	Not Detected	---	2.82E-002
I-131	Not Detected	---	2.87E-002
IR-192	Not Detected	---	2.42E-002
K-40	1.52E+001	2.39E+000	2.80E-001
MN-52	Not Detected	---	3.50E-002
MN-54	Not Detected	---	1.59E-002
MO-99	Not Detected	---	3.29E-001
NA-22	Not Detected	---	4.56E-002
NA-24	Not Detected	---	1.57E-001
NB-95	Not Detected	---	1.33E-001
ND-147	Not Detected	---	2.05E-001
NI-57	Not Detected	---	9.51E-002
RU-103	Not Detected	---	2.59E-002
RU-106	Not Detected	---	2.83E-001
SB-122	Not Detected	---	5.14E-002
SB-124	Not Detected	---	2.73E-002
SB-125	Not Detected	---	7.24E-002
SN-113	Not Detected	---	3.43E-002
SR-85	Not Detected	---	3.46E-002
TA-182	Not Detected	---	1.57E-001
TA-183	Not Detected	---	1.94E-001
TC-99m	Not Detected	---	1.35E+000
TL-201	Not Detected	---	1.23E-001
XE-133	Not Detected	---	1.18E-001
Y-88	Not Detected	---	3.20E-002
ZN-65	Not Detected	---	1.07E-001
ZR-95	Not Detected	---	5.74E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/11/99 7:42:39 AM

Analyzed by: 3/11/99 Reviewed by: 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90053013

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 3/11/99 7:32:26 AM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.66E+003
RA-226	Not Detected	---	5.20E+003
PB-214	Not Detected	---	7.19E+002
BI-214	Not Detected	---	6.62E+002
PB-210	Not Detected	---	6.78E+004
TH-232	Not Detected	---	2.29E+003
RA-228	Not Detected	---	2.80E+003
AC-228	Not Detected	---	1.76E+003
TH-228	Not Detected	---	1.32E+005
RA-224	Not Detected	---	7.61E+003
PB-212	Not Detected	---	9.52E+003
BI-212	Not Detected	---	9.10E+004
TL-208	Not Detected	---	2.00E+004
U-235	Not Detected	---	1.41E+003
TH-231	Not Detected	---	1.94E+004
PA-231	Not Detected	---	1.36E+004
TH-227	Not Detected	---	2.31E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.11E+003
PB-211	Not Detected	---	1.38E+004
TL-207	Not Detected	---	2.55E+005
AM-241	8.22E+004	1.41E+004	1.40E+003
PU-239	Not Detected	---	2.37E+006
NP-237	Not Detected	---	1.37E+003
PA-233	Not Detected	---	6.26E+002
TH-229	Not Detected	---	1.12E+003

[Summary Report] - Sample ID: : 90053013

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.51E+002
AG-110m	Not Detected	---------	8.75E+006
BA-133	Not Detected	---------	7.81E+002
BE-7	Not Detected	---------	6.25E+020
BI-207	Not Detected	---------	3.47E+002
CD-109	Not Detected	---------	4.53E+005
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	8.70E+008
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	2.37E+006
CO-56	Not Detected	---------	3.38E+014
CO-57	Not Detected	---------	4.25E+005
CO-58	Not Detected	---------	3.50E+015
CO-60	7.70E+004	1.08E+004	5.27E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	4.92E+003
CS-137	6.95E+004	9.32E+003	3.12E+002
EU-152	Not Detected	---------	8.18E+002
EU-154	Not Detected	---------	3.01E+003
EU-155	Not Detected	---------	2.61E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	2.76E+006
HG-203	Not Detected	---------	1.46E+022
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	7.97E+014
K-40	Not Detected	---------	1.59E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	3.51E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	2.13E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	1.01E+006
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	5.49E+017
SB-125	Not Detected	---------	9.31E+003
SN-113	Not Detected	---------	4.32E+010
SR-85	Not Detected	---------	5.79E+016
TA-182	Not Detected	---------	1.20E+011
TA-183	Not Detected	---------	1.00E+026
TC-99m	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	6.41E+010
ZN-65	Not Detected	---------	5.49E+006
ZR-95	Not Detected	---------	1.32E+017

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 3/11/99 7:42:40 AM
QA File : C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst : KIC
Sample ID : 90053013
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 3/11/99 7:32:26 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 ACTIVITY	8.513E-002	4.978E-003	8.218E-002	<	:	:	>
CS-137 Activity	6.821E-002	3.535E-003	6.953E-002	<	:	:	>
CO-60 Activity	7.588E-002	4.619E-003	7.758E-002	<	:	:	>

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 3/11/99

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/11/99 8:18:06 AM

Analyzed by: 3/11/99 Reviewed by: 3/11/99

Customer : C. BYRD (6134)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90053014

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 3/11/99 8:07:52 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 606 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	4.04E+003
RA-226	Not Detected	---	5.88E+003
PB-214	Not Detected	---	6.36E+002
BI-214	Not Detected	---	5.33E+002
PB-210	Not Detected	---	2.59E+005
TH-232	Not Detected	---	1.93E+003
RA-228	Not Detected	---	2.25E+003
AC-228	Not Detected	---	1.34E+003
TH-228	Not Detected	---	1.27E+005
RA-224	Not Detected	---	2.91E+003
PB-212	Not Detected	---	9.47E+003
BI-212	Not Detected	---	7.56E+004
TL-208	Not Detected	---	1.68E+004
U-235	Not Detected	---	1.58E+003
TH-231	Not Detected	---	1.27E+004
PA-231	Not Detected	---	1.32E+004
TH-227	Not Detected	---	2.33E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	5.39E+003
PB-211	Not Detected	---	1.19E+004
TL-207	Not Detected	---	1.98E+005
AM-241	8.19E+004	1.48E+004	2.81E+003
PU-239	Not Detected	---	2.77E+006
NP-237	Not Detected	---	2.14E+003
PA-233	Not Detected	---	5.54E+002
TH-229	Not Detected	---	1.75E+003

[Summary Report] - Sample ID: : 90053014

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	2.65E+002
AG-110m	Not Detected	---------	6.82E+006
BA-133	Not Detected	---------	7.18E+002
BE-7	Not Detected	---------	5.39E+020
CD-109	Not Detected	---------	6.71E+005
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	9.87E+008
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	2.58E+006
CO-56	Not Detected	---------	2.60E+014
CO-57	Not Detected	---------	5.00E+005
CO-58	Not Detected	---------	2.67E+015
CO-60	8.02E+004	1.08E+004	3.90E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	4.32E+003
CS-137	7.15E+004	9.49E+003	2.50E+002
EU-152	Not Detected	---------	9.65E+002
EU-154	Not Detected	---------	2.32E+003
EU-155	Not Detected	---------	3.33E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	4.57E+006
HG-203	Not Detected	---------	1.38E+022
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	7.18E+014
K-40	Not Detected	---------	1.25E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	2.74E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	1.79E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	8.28E+005
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	4.73E+017
SB-125	Not Detected	---------	8.48E+003
SN-113	Not Detected	---------	3.87E+010
SR-85	Not Detected	---------	4.87E+016
TA-182	Not Detected	---------	9.65E+010
TA-183	Not Detected	---------	1.00E+026
TC-99m	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	5.92E+010
ZN-65	Not Detected	---------	4.40E+006
ZR-95	Not Detected	---------	1.03E+017

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 3/11/99 8:18:08 AM
QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst : LRH
Sample ID : 90053014
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 3/11/99 8:07:52 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.181E-002	4.012E-003	8.190E-002	<	:	:	: >
CS-137 Activity	7.061E-002	1.957E-003	7.150E-002	<	:	:	: >
CO-60 Activity	7.859E-002	2.154E-003	8.061E-002	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 3/11/99

Survey Number: S17547

RADIOLOGICAL SURVEY FORM

Location ER site 58	Requester/Org Mignardot, Edward \ 6114	Date 03/09/99	Time 1645	Duration .8
Purpose Release of samples		Request # N\A	RWP # 0511	RPIR # N\A
Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name		Surveyor(s) Signature
ASP – 1 hP 260 \ 2356	N\A	Arthur L. Tucker		
N\A	N\A	N\A		N\A
N\A	N\A	N\A		N\A

#	Item Description/Location	BETA-GAMMA ACTIVITY Counting Data Attached ☒Yes ☐No % Eff. 0.2 /Radionuclide N\A				ALPHA ACTIVITY Counting Data Attached ☒Yes ☐No % Eff. N\A /Radionuclide N\A				RADIATION SURVEY Bkg. N\A	
		cpm	Bkg. cpm	dpm / 100 cm² [1]	T/R/F [2]	cpm	Bkg. cpm	dpm / 100 cm² [1]	T/R/F [2]	mrem/hr [3]	Distance
1	044284-001/004	80/80	80	ND	T	N\A	N\A	N\A	R	N\A	N\A
2	044283-001/004	80/80	80	ND	T	N\A	N\A	N\A	R	N\A	N\A
3	044282-001/004	80/80	80	ND	T	N\A	N\A	N\A	R	N\A	N\A
4	044281-001/004	180/80	80	500	T	N\A	N\A	N\A	R	N\A	N\A
5	044291-001/004	80/80	80	ND	T	N\A	N\A	N\A	R	N\A	N\A
6	044280-001/004	200/80	80	1000	T	N\A	N\A	N\A	R	N\A	N\A
7	044279-001/004	80/80	80	ND	T	N\A	N\A	N\A	R	N\A	N\A
8	044285-001/002/003/004	300/300/500/800	80	4000	T	N\A	N\A	N\A	R	N\A	N\A
9	044286-001/002/003/004	300/80/80/2000	80	10000	T	N\A	N\A	N\A	R	N\A	N\A
10	044287-001/002/003/004	80/80/80/200	80	1000	T	N\A	N\A	N\A	R	N\A	N\A
11	044288-001/002/003/004	80/80/80/80	80	ND	T	N\A	N\A	N\A	R	N\A	N\A
12	044289-001/002/003/004	80/80/80/80	80	ND	T	N\A	N\A	N\A	R	N\A	N\A

[1] If area other than 100 cm², record as dpm/probe, or dpm/LAW. [2] Total/Removable/Fixed. [3] Indicate type, if other than gamma (i.e., n, α, or β).

Remarks: Direct firsk results for samples 1 – 7 are shown as sample –001 / 004. Samples 8-12 are shown as 001/002/003/004. Samples with multiple activities, only the highest activity found is listed.

	Reviewed by:	Date:

****
* Sandia Radioactive Sample Diagnostics Program 3-10-1999 *
****

LSC Analysis Program - version 5.3

2-4
#517457

Batch Number : 93021902
Count Protocol : 13
Client : 58 SAMPLES 3/9/99 1530 A. TUCKER 7523 93021902
Laboratory ID : 6921-2 S/N 405921
Count Date : 10-Mar-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 0-12
Count Time : 5.0 minutes
Background cpm : 19.80 +- 4.21
Background tSIE : 419.1
Background Eff : 0.378
Systematic Error : 12.90%
Sample Aliquot : 1.000 f

H-3 MDA = 2.60E+01 dpm/f
H-3 CL = 1.23E+01 dpm/f

H-3 Efficiency = 0.9740 - exp(-0.00047*tSIE^1.1600)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: RT Preston 3/10/99 Reviewed by: RT Preston 3/10/99

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity dpm/f	Error	Flag
2	001	001	1.86E+01	3.98E+00	413	0.372	-3.23E+00	2.24E+01	<CL
3	002	002	1.98E+01	4.06E+00	398	0.359	0.00E+00	2.30E+01	<CL
4	003	003	2.00E+01	4.08E+00	387	0.350	5.72E-01	2.38E+01	<CL
5	004	004	2.18E+01	4.29E+00	397	0.358	5.58E+00	2.45E+01	<CL
6	005	005	1.80E+01	3.92E+00	410	0.370	-4.87E+00	2.26E+01	<CL
7	006	006	2.32E+01	4.38E+00	409	0.369	9.21E+00	2.45E+01	<CL
8	007	007	2.44E+01	4.53E+00	409	0.369	1.25E+01	2.53E+01	@CL
9	008	008	2.22E+01	4.29E+00	405	0.365	6.57E+00	2.41E+01	<CL
10	009	009	2.02E+01	4.14E+00	402	0.363	1.10E+00	2.32E+01	<CL
11	010	010	2.06E+01	4.18E+00	399	0.360	2.22E+00	2.36E+01	<CL
12	011	011	1.94E+01	4.10E+00	394	0.356	-1.12E+00	2.35E+01	<CL
13	012	012	1.90E+01	4.06E+00	407	0.367	-2.18E+00	2.28E+01	<CL

****
* Sandia Radioactive Sample Diagnostics Program 3-10-1999 *
****
LSC Analysis Program - version 5.3

3-4
#517457

Batch Number : 93021902
Count Protocol : 13
Client : 58 SAMPLES 3/9/99 1530 A. TUCKER 7523 93021902
Laboratory ID : 6921-2 S/N 405921
Count Date : 10-Mar-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 20-600
Count Time : 5.0 minutes
Background cpm : 5.40 +- 2.08
Background tSIE : 419.1
Background Eff : 1.039
Systematic Error : 8.90%
Sample Aliquot : 1.000 f

Alpha MDA = 5.18E+00 dpm/f
Alpha CL = 2.33E+00 dpm/f

Alpha Efficiency = 1.0390 - exp(-0.00990*tSIE^1.1780)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity dpm/f	Error	Flag
2	001	001	6.40E+00	2.26E+00	413	1.039	9.62E-01	4.26E+00	<CL
3	002	002	4.60E+00	1.92E+00	398	1.039	-7.70E-01	3.92E+00	<CL
4	003	003	5.00E+00	2.00E+00	387	1.039	-3.85E-01	3.96E+00	<CL
5	004	004	4.80E+00	1.96E+00	397	1.039	-5.77E-01	3.94E+00	<CL
6	005	005	4.40E+00	1.88E+00	410	1.039	-9.62E-01	3.89E+00	<CL
7	006	006	6.60E+00	2.30E+00	409	1.039	1.15E+00	4.31E+00	<CL
8	007	007	3.60E+00	1.70E+00	409	1.039	-1.73E+00	3.79E+00	<CL
9	008	008	4.00E+00	1.79E+00	405	1.039	-1.35E+00	3.84E+00	<CL
10	009	009	4.80E+00	1.96E+00	402	1.039	-5.77E-01	3.94E+00	<CL
11	010	010	4.20E+00	1.83E+00	399	1.039	-1.15E+00	3.87E+00	<CL
12	011	011	4.80E+00	1.96E+00	394	1.039	-5.77E-01	3.94E+00	<CL
13	012	012	5.40E+00	2.08E+00	407	1.039	0.00E+00	4.00E+00	<CL

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program              3-10-1999 *
**********************************************************************
LSC Analysis Program - version 5.3

Batch Number        : 93021902
Count Protocol      : 13
Client              : 58 SAMPLES 3/9/99 1530 A. TUCKER 7523
Laboratory ID       : 6921-2  S/N 405921
Count Date          : 10-Mar-99
Protocol Name       : H3AB -- SWIPE
Region of Interest  : 12-2000
Count Time          : 5.0 minutes
Background cpm      : 41.80 +- 5.78
Background tSIE     : 419.1
Background Eff      : 0.841
Systematic Error    :  6.30%
Sample Aliquot      : 1.000 f

Beta MDA =  1.67E+01 dpm/f
Beta CL  =  8.01E+00 dpm/f

Beta Efficiency = 0.8410 - exp(-0.01319*tSIE^1.1040)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

4-4
#S17457

93021902

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
2	001	001	4.02E+01	5.67E+00	413	0.841	-1.90E+00	1.37E+01	<CL
3	002	002	3.66E+01	5.41E+00	398	0.841	-6.18E+00	1.37E+01	<CL
4	003	003	3.92E+01	5.60E+00	387	0.841	-3.09E+00	1.37E+01	<CL
5	004	004	3.44E+01	5.25E+00	397	0.841	-8.80E+00	1.37E+01	<CL
6	005	005	3.94E+01	5.61E+00	410	0.841	-2.85E+00	1.37E+01	<CL
7	006	006	3.48E+01	5.28E+00	409	0.841	-8.32E+00	1.37E+01	<CL
8	007	007	3.66E+01	5.41E+00	409	0.841	-6.18E+00	1.37E+01	<CL
9	008	008	3.70E+01	5.44E+00	405	0.841	-5.71E+00	1.37E+01	<CL
10	009	009	3.98E+01	5.64E+00	402	0.841	-2.38E+00	1.37E+01	<CL
11	010	010	3.58E+01	5.35E+00	399	0.841	-7.13E+00	1.37E+01	<CL
12	011	011	3.88E+01	5.57E+00	394	0.841	-3.57E+00	1.37E+01	<CL
13	012	012	4.02E+01	5.67E+00	407	0.841	-1.90E+00	1.37E+01	<CL

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab Batch No. 900214 | SAR/WR No. 1/29 | Page 1 of 1 | AR/COC 601577

Dept. No./Mail Stop:	6134/1148	[redacted]	Contract No.: ~~AJ-2400~~ N/A
Project/Task Manager:	Caroline Byrd	[redacted]	Case No.: 7213.220600
Project Name:	Foothill Test Area SITE 58	Lab Contact: ~~Edie Kent~~ Fernando	SMO Authorization:
Record Center Code:	ER/1333/58/DAT	Lab Destination: ~~GEL~~ AMIR ON SITE	Bill To: Sandia National Laboratories
Logbook Ref. No.:	N/A	SMO Contact/Phone: Doug Salmi/844-3110	Supplier Services Dept.:
Service Order No.	CFO655	Send Report to SMO: Suzi Jensen	P.O. Box 5800 MS 0154
Location	NA		

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Lab Sample ID
044276-004	S58B-GR-103-15-S	15	58	12799/1055	s	M	500ml	none	G	SA	Gamma Spec	[redacted]
044277-004	S58B-GR-104-20-S	20	58	12799/1130	s	M	500ml	none	G	SA	Gamma Spec	
044103-004	S58FB3-GR-001-0-SS	0	58	12899/900	S	M	500ml	none	G	SA	Gamma Spec	
044104-004	S58FB3-GR-002-0-SS	0	58	12899/910	S	M	500ml	none	G	SA	Gamma Spec	
044105-004	S58FB3-GR-003-0-SS	0	58	12899/915	S	M	500ml	none	G	SA	Gamma Spec	
044106-004	S58FB3-GR-004-0-SS	0	58	12899/920	S	M	500ml	none	G	SA	Gamma Spec	
				VR 2/3/99								

RMMA	☒ Yes ☐ No	Ref. No.	[redacted]
Sample Disposal	☒ Return to Client ☐ Disposal by lab		
Turnaround Time	☐ Normal ☒ Rush		
		Required Report Date	

Special Instructions/QC Requirements
EDD ☐ Yes ☑ No
Raw Data Package ☐ Yes ☒ No
This COC releases COC 601353
Please list as separate report.

	Name	Signature	Init	Company/Organization/Phone
Sample Team Members	Chris Catechis	Ch. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	William J. Gibson	WJG	MDM/6131/235-3841

1. Relinquished by	Ch. Catechis	Org. 6131	Date 1/29/99	Time 1003	4 Relinquished by (SMO) Org. 7598 Date 2/1/99 Time 1300
1 Received by	(SMO)	Org. 7577	Date 1/29/99	Time 1003	4. Received by Org. 6133 Date 2/1/99 Time 1300
2. Relinquished by	(SMO)	Org. 7577	Date 1/29/99	Time 1045	5 Relinquished by Org. Date Time
2. Received by		Org. SNL7577	Date 1-29-99	Time 1045	5. Received by Org. Date Time
3. Relinquished by		Org. SNL7577	Date 2-1-99	Time 1044	6 Relinquished by Org. Date Time
3. Received by	(SMO)	Org. 7598	Date 2-1-99	Time 1044	6 Received by Org. Date Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

Shaded areas are for RPSD use only

To be completed by Customer

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Site 8/58
Phone: 845-0568
Date Results Needed: RUSH MONDAY
Suspect Isotopes: ? NONE
Other Information: @ SITE 58

Hazards/Special Instructions:
100 MIN COUNT
F38 01
CASE # 7213, 2206
CoC 601577

Batch Log Number: 900214
Logged By: JM

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044276-004	Soil	12799/1055	500 ml	Gamma Spec	01	<300	781 g	
044277-004	↓	12799/1130	↓	↓	02	↓	820 g	
044103-004		12899/900			03		735 g	
044104-004		12899/910			04		661 g	
044105-004		12899/915			05	↓	795 g	
044106-004	↓	12899/920	↓	↓	06	<300	727 g	
LCS	—	1/NOV 90	—	γ Spec	07	N/A	N/A	

Relinquished by [signature] Date 1-27-99 Time 1045 Received by [signature] Date 1-29-99 Time 1045
Relinquished by [signature] Date 2-1-99 Time 1044 Received by [signature] Date 2-1-99 Time 1044
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 1/31/99 2:43:08 PM *
****

* Analyzed by: 2/1/99 Reviewed by: 2/1/99 *

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044276-004
Lab Sample ID : 90021401

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 781.000 gram
Sample Date/Time : 1/27/99 10:55:00 AM
Acquire Start Date/Time : 1/31/99 1:02:55 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.14E-001
RA-226	7.83E-001	4.85E-001	4.70E-001
PB-214	2.79E-001	9.46E-002	5.84E-002
BI-214	2.77E-001	8.69E-002	4.01E-002
PB-210	Not Detected	---------	6.70E+000
TH-232	5.55E-001	2.89E-001	1.20E-001
RA-228	5.46E-001	2.46E-001	1.26E-001
AC-228	4.47E-001	1.85E-001	7.70E-002
TH-228	Not Detected	---------	5.54E-001
RA-224	5.51E-001	2.97E-001	8.44E-002
PB-212	4.42E-001	1.40E-001	3.65E-002
BI-212	3.54E-001	5.35E-001	2.43E-001
TL-208	4.08E-001	3.11E-001	5.69E-002
U-235	Not Detected	---------	1.62E-001
TH-231	Not Detected	---------	5.91E+000
PA-231	Not Detected	---------	1.07E+000
TH-227	Not Detected	---------	2.39E-001
RA-223	Not Detected	---------	1.23E-001
RN-219	Not Detected	---------	2.99E-001
PB-211	Not Detected	---------	6.76E-001
TL-207	Not Detected	---------	1.24E+001
AM-241	Not Detected	---------	1.59E-001
PU-239	Not Detected	---------	3.01E+002
NP-237	Not Detected	---------	1.56E-001
PA-233	Not Detected	---------	4.68E-002
TH-229	Not Detected	---------	1.40E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021401

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.31E-002
AG-110m	Not Detected	---------	2.67E-002
BA-133	Not Detected	---------	3.61E-002
BE-7	Not Detected	---------	2.06E-001
BI-207	Not Detected	---------	2.53E-002
CD-109	Not Detected	---------	6.50E-001
CD-115	Not Detected	---------	2.02E-001
CE-139	Not Detected	---------	2.02E-002
CE-141	Not Detected	---------	3.96E-002
CE-144	Not Detected	---------	1.58E-001
CO-56	Not Detected	---------	2.93E-002
CO-57	Not Detected	---------	2.06E-002
CO-58	Not Detected	---------	3.02E-002
CO-60	Not Detected	---------	3.76E-002
CR-51	Not Detected	---------	1.97E-001
CS-134	Not Detected	---------	2.76E-002
CS-137	Not Detected	---------	2.80E-002
EU-152	Not Detected	---------	6.13E-002
EU-154	Not Detected	---------	1.58E-001
EU-155	Not Detected	---------	9.22E-002
FE-59	Not Detected	---------	7.13E-002
GD-153	Not Detected	---------	5.28E-002
HG-203	Not Detected	---------	2.60E-002
I-131	Not Detected	---------	3.21E-002
IR-192	Not Detected	---------	2.26E-002
K-40	1.40E+001	2.21E+000	5.91E-001
MN-52	Not Detected	---------	4.56E-002
MN-54	Not Detected	---------	3.00E-002
MO-99	Not Detected	---------	6.01E-001
NA-22	Not Detected	---------	4.28E-002
NA-24	Not Detected	---------	2.85E+000
NB-95	Not Detected	---------	1.93E-001
ND-147	Not Detected	---------	2.09E-001
NI-57	Not Detected	---------	2.86E-001
RU-103	Not Detected	---------	2.48E-002
RU-106	Not Detected	---------	2.49E-001
SB-122	Not Detected	---------	9.06E-002
SB-124	Not Detected	---------	2.52E-002
SB-125	Not Detected	---------	6.44E-002
SN-113	Not Detected	---------	3.01E-002
SR-85	Not Detected	---------	3.22E-002
TA-182	Not Detected	---------	1.39E-001
TA-183	Not Detected	---------	2.37E-001
TC-99m	Not Detected	---------	1.76E+003
TL-201	Not Detected	---------	1.91E-001
XE-133	Not Detected	---------	2.36E-001
Y-88	Not Detected	---------	3.18E-002
ZN-65	Not Detected	---------	8.87E-002
ZR-95	Not Detected	---------	5.24E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 7:22:45 AM

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044277-004
Lab Sample ID : 90021402

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 820.000 gram
Sample Date/Time : 1/27/99 11:30:00 AM
Acquire Start Date/Time : 1/31/99 2:44:56 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.14E-001
RA-226	5.57E-001	5.62E-001	4.29E-001
PB-214	3.11E-001	9.77E-002	5.68E-002
BI-214	3.00E-001	1.85E-001	4.38E-002
PB-210	Not Detected	---------	6.07E+000
TH-232	4.86E-001	3.10E-001	1.27E-001
RA-228	5.25E-001	2.65E-001	1.54E-001
AC-228	4.85E-001	1.77E-001	8.06E-002
TH-228	5.05E-001	2.33E-001	3.67E-001
RA-224	5.64E-001	3.12E-001	9.68E-002
PB-212	4.87E-001	1.99E-001	3.52E-002
BI-212	4.93E-001	4.32E-001	2.74E-001
TL-208	4.66E-001	1.44E-001	5.82E-002
U-235	1.19E-001	1.36E-001	1.61E-001
TH-231	Not Detected	---------	5.62E+000
PA-231	Not Detected	---------	1.08E+000
TH-227	Not Detected	---------	2.32E-001
RA-223	Not Detected	---------	1.17E-001
RN-219	Not Detected	---------	3.02E-001
PB-211	Not Detected	---------	6.90E-001
TL-207	Not Detected	---------	1.30E+001
AM-241	Not Detected	---------	1.61E-001
PU-239	Not Detected	---------	2.82E+002
NP-237	Not Detected	---------	1.94E-001
PA-233	Not Detected	---------	4.97E-002
TH-229	Not Detected	---------	1.37E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021402

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.14E-002
AG-110m	Not Detected	---	2.58E-002
BA-133	Not Detected	---	3.62E-002
BE-7	Not Detected	---	2.09E-001
BI-207	Not Detected	---	2.38E-002
CD-109	Not Detected	---	6.28E-001
CD-115	Not Detected	---	1.93E-001
CE-139	Not Detected	---	2.03E-002
CE-141	Not Detected	---	3.77E-002
CE-144	Not Detected	---	1.56E-001
CO-56	Not Detected	---	3.07E-002
CO-57	Not Detected	---	1.96E-002
CO-58	Not Detected	---	2.70E-002
CO-60	Not Detected	---	3.57E-002
CR-51	Not Detected	---	2.07E-001
CS-134	Not Detected	---	2.73E-002
CS-137	Not Detected	---	2.74E-002
EU-152	Not Detected	---	5.87E-002
EU-154	Not Detected	---	1.52E-001
EU-155	Not Detected	---	9.10E-002
FE-59	Not Detected	---	7.35E-002
GD-153	Not Detected	---	5.47E-002
HG-203	Not Detected	---	2.52E-002
I-131	Not Detected	---	3.26E-002
IR-192	Not Detected	---	2.32E-002
K-40	1.60E+001	2.52E+000	5.67E-001
MN-52	Not Detected	---	4.72E-002
MN-54	Not Detected	---	3.05E-002
MO-99	Not Detected	---	5.60E-001
NA-22	Not Detected	---	4.41E-002
NA-24	Not Detected	---	3.20E+000
NB-95	Not Detected	---	1.90E-001
ND-147	Not Detected	---	1.97E-001
NI-57	Not Detected	---	3.23E-001
RU-103	Not Detected	---	2.37E-002
RU-106	Not Detected	---	2.33E-001
SB-122	Not Detected	---	9.35E-002
SB-124	Not Detected	---	2.44E-002
SB-125	Not Detected	---	6.30E-002
SN-113	Not Detected	---	2.94E-002
SR-85	Not Detected	---	3.06E-002
TA-182	Not Detected	---	1.41E-001
TA-183	Not Detected	---	2.41E-001
TC-99m	Not Detected	---	1.94E+003
TL-201	Not Detected	---	1.88E-001
XE-133	Not Detected	---	2.42E-001
Y-88	Not Detected	---	2.94E-002
ZN-65	Not Detected	---	9.59E-002
ZR-95	Not Detected	---	4.92E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 7:33:50 AM

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044103-004
Lab Sample ID : 90021403

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 735.000 gram
Sample Date/Time : 1/28/99 9:00:00 AM
Acquire Start Date/Time : 1/31/99 4:26:57 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	5.18E-001
RA-226	1.43E+000	8.57E-001	5.36E-001
PB-214	5.96E-001	1.28E-001	6.51E-002
BI-214	5.60E-001	3.01E-001	4.94E-002
PB-210	Not Detected	---------	8.04E+000
TH-232	8.36E-001	7.30E-001	1.44E-001
RA-228	6.80E-001	3.02E-001	1.79E-001
AC-228	7.10E-001	2.11E-001	9.50E-002
TH-228	9.46E-001	3.47E-001	4.65E-001
RA-224	9.74E-001	4.11E-001	8.27E-002
PB-212	7.80E-001	1.54E-001	4.21E-002
BI-212	6.26E-001	4.00E-001	3.35E-001
TL-208	6.80E-001	1.68E-001	7.01E-002
U-235	9.58E-002	1.67E-001	1.96E-001
TH-231	Not Detected	---------	7.14E+000
PA-231	Not Detected	---------	1.30E+000
TH-227	Not Detected	---------	2.99E-001
RA-223	Not Detected	---------	1.42E-001
RN-219	Not Detected	---------	3.61E-001
PB-211	Not Detected	---------	7.88E-001
TL-207	Not Detected	---------	1.46E+001
AM-241	Not Detected	---------	2.01E-001
PU-239	Not Detected	---------	3.54E+002
NP-237	~~5.45E-001~~	~~2.49E-001~~	2.18E-001 Not detected
PA-233	Not Detected	---------	5.55E-002
TH-229	Not Detected	---------	1.64E-001

2/1/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021403

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.76E-002
AG-110m	Not Detected	---------	4.65E-002
BA-133	Not Detected	---------	4.58E-002
BE-7	Not Detected	---------	2.55E-001
BI-207	Not Detected	---------	3.07E-002
CD-109	Not Detected	---------	8.35E-001
CD-115	Not Detected	---------	1.92E-001
CE-139	Not Detected	---------	2.48E-002
CE-141	Not Detected	---------	4.54E-002
CE-144	Not Detected	---------	1.96E-001
CO-56	Not Detected	---------	3.59E-002
CO-57	Not Detected	---------	2.43E-002
CO-58	Not Detected	---------	3.56E-002
CO-60	Not Detected	---------	3.92E-002
CR-51	Not Detected	---------	2.47E-001
CS-134	Not Detected	---------	3.45E-002
CS-137	1.33E-001	5.46E-002	2.64E-002
EU-152	Not Detected	---------	7.24E-002
EU-154	Not Detected	---------	1.79E-001
EU-155	Not Detected	---------	1.09E-001
FE-59	Not Detected	---------	7.74E-002
GD-153	Not Detected	---------	6.64E-002
HG-203	Not Detected	---------	3.11E-002
I-131	Not Detected	---------	3.70E-002
IR-192	Not Detected	---------	2.77E-002
K-40	1.50E+001	2.44E+000	6.38E-001
MN-52	Not Detected	---------	4.63E-002
MN-54	Not Detected	---------	3.84E-002
MO-99	Not Detected	---------	5.17E-001
NA-22	Not Detected	---------	4.87E-002
NA-24	Not Detected	---------	1.46E+000
NB-95	Not Detected	---------	2.02E-001
ND-147	Not Detected	---------	2.51E-001
NI-57	Not Detected	---------	2.67E-001
RU-103	Not Detected	---------	2.86E-002
RU-106	Not Detected	---------	2.84E-001
SB-122	Not Detected	---------	9.07E-002
SB-124	Not Detected	---------	3.13E-002
SB-125	Not Detected	---------	8.25E-002
SN-113	Not Detected	---------	3.73E-002
SR-85	Not Detected	---------	3.75E-002
TA-182	Not Detected	---------	1.70E-001
TA-183	Not Detected	---------	2.69E-001
TC-99m	Not Detected	---------	2.38E+002
TL-201	Not Detected	---------	1.93E-001
XE-133	Not Detected	---------	2.34E-001
Y-88	Not Detected	---------	3.16E-002
ZN-65	Not Detected	---------	1.09E-001
ZR-95	Not Detected	---------	5.44E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 7:44:43 AM

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044104-004
Lab Sample ID : 90021404

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 661.000 gram
Sample Date/Time : 1/28/99 9:10:00 AM
Acquire Start Date/Time : 1/31/99 6:08:58 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.88E-001	4.09E-001	5.14E-001
RA-226	1.41E+000	1.06E+000	6.16E-001
PB-214	6.13E-001	1.58E-001	7.33E-002
BI-214	5.55E-001	1.51E-001	5.72E-002
PB-210	Not Detected	---	8.95E+000
TH-232	8.50E-001	4.50E-001	1.70E-001
RA-228	7.02E-001	2.99E-001	1.85E-001
AC-228	7.65E-001	1.62E-001	9.66E-002
TH-228	6.50E-001	2.53E-001	5.44E-001
RA-224	9.86E-001	3.81E-001	9.84E-002
PB-212	7.52E-001	1.50E-001	4.58E-002
BI-212	7.89E-001	5.25E-001	3.15E-001
TL-208	7.57E-001	1.96E-001	6.63E-002
U-235	Not Detected	---	2.15E-001
TH-231	Not Detected	---	8.00E+000
PA-231	Not Detected	---	1.51E+000
TH-227	Not Detected	---	3.17E-001
RA-223	Not Detected	---	1.59E-001
RN-219	Not Detected	---	4.20E-001
PB-211	Not Detected	---	9.59E-001
TL-207	Not Detected	---	1.61E+001
AM-241	Not Detected	---	2.14E-001
PU-239	Not Detected	---	3.89E+002
NP-237	Not Detected	---	2.65E-001
PA-233	Not Detected	---	6.30E-002
TH-229	Not Detected	---	1.80E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021404

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.27E-002
AG-110m	Not Detected	---	7.72E-002
BA-133	Not Detected	---	4.94E-002
BE-7	Not Detected	---	2.90E-001
BI-207	Not Detected	---	3.36E-002
CD-109	Not Detected	---	8.84E-001
CD-115	Not Detected	---	2.18E-001
CE-139	Not Detected	---	2.63E-002
CE-141	Not Detected	---	4.87E-002
CE-144	Not Detected	---	2.09E-001
CO-56	Not Detected	---	4.04E-002
CO-57	Not Detected	---	2.68E-002
CO-58	Not Detected	---	3.70E-002
CO-60	Not Detected	---	3.99E-002
CR-51	Not Detected	---	2.88E-001
CS-134	Not Detected	---	3.72E-002
CS-137	5.42E-001	1.58E-001	2.69E-002
EU-152	Not Detected	---	7.94E-002
EU-154	Not Detected	---	2.07E-001
EU-155	Not Detected	---	1.22E-001
FE-59	Not Detected	---	8.69E-002
GD-153	Not Detected	---	7.28E-002
HG-203	Not Detected	---	3.52E-002
I-131	Not Detected	---	4.26E-002
IR-192	Not Detected	---	3.17E-002
K-40	1.60E+001	2.50E+000	7.08E-001
MN-52	Not Detected	---	5.96E-002
MN-54	Not Detected	---	4.23E-002
MO-99	Not Detected	---	6.53E-001
NA-22	Not Detected	---	4.83E-002
NA-24	Not Detected	---	1.51E+000
NB-95	Not Detected	---	2.20E-001
ND-147	Not Detected	---	2.73E-001
NI-57	Not Detected	---	2.76E-001
RU-103	Not Detected	---	3.20E-002
RU-106	Not Detected	---	3.09E-001
SB-122	Not Detected	---	9.95E-002
SB-124	Not Detected	---	3.39E-002
SB-125	Not Detected	---	9.35E-002
SN-113	Not Detected	---	4.11E-002
SR-85	Not Detected	---	4.02E-002
TA-182	Not Detected	---	1.89E-001
TA-183	Not Detected	---	2.90E-001
TC-99m	Not Detected	---	3.18E+002
TL-201	Not Detected	---	2.15E-001
XE-133	Not Detected	---	2.59E-001
Y-88	Not Detected	---	3.40E-002
ZN-65	Not Detected	---	1.23E-001
ZR-95	Not Detected	---	6.09E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 7:57:47 AM

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044105-004
Lab Sample ID : 90021405

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 795.000 gram
Sample Date/Time : 1/28/99 9:15:00 AM
Acquire Start Date/Time : 1/31/99 7:50:57 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.96E-001
RA-226	1.18E+000	6.51E-001	5.00E-001
PB-214	5.47E-001	3.47E-001	6.02E-002
BI-214	5.04E-001	1.30E-001	4.61E-002
PB-210	Not Detected	---------	7.11E+000
TH-232	7.19E-001	4.01E-001	1.29E-001
RA-228	6.69E-001	2.87E-001	1.58E-001
AC-228	7.09E-001	1.89E-001	7.92E-002
TH-228	8.69E-001	2.86E-001	4.62E-001
RA-224	7.72E-001	2.81E-001	1.13E-001
PB-212	7.50E-001	1.68E-001	3.58E-002
BI-212	6.81E-001	4.67E-001	2.90E-001
TL-208	6.36E-001	1.71E-001	6.39E-002
U-235	1.27E-001	1.57E-001	1.85E-001
TH-231	Not Detected	---------	6.82E+000
PA-231	Not Detected	---------	1.24E+000
TH-227	Not Detected	---------	2.82E-001
RA-223	Not Detected	---------	1.36E-001
RN-219	Not Detected	---------	3.18E-001
PB-211	Not Detected	---------	7.31E-001
TL-207	Not Detected	---------	1.35E+001
AM-241	Not Detected	---------	1.83E-001
PU-239	Not Detected	---------	3.33E+002
NP-237	Not Detected	---------	2.32E-001
PA-233	Not Detected	---------	5.56E-002
TH-229	Not Detected	---------	1.57E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021405

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.75E-002
AG-110m	Not Detected	---------	3.72E-002
BA-133	Not Detected	---------	4.24E-002
BE-7	Not Detected	---------	2.41E-001
BI-207	Not Detected	---------	2.83E-002
CD-109	Not Detected	---------	7.73E-001
CD-115	Not Detected	---------	1.83E-001
CE-139	Not Detected	---------	2.27E-002
CE-141	Not Detected	---------	4.22E-002
CE-144	Not Detected	---------	1.81E-001
CO-56	Not Detected	---------	3.09E-002
CO-57	Not Detected	---------	2.26E-002
CO-58	Not Detected	---------	3.00E-002
CO-60	Not Detected	---------	3.93E-002
CR-51	Not Detected	---------	2.27E-001
CS-134	Not Detected	---------	3.07E-002
CS-137	6.47E-002	3.19E-002	2.16E-002
EU-152	Not Detected	---------	6.77E-002
EU-154	Not Detected	---------	1.80E-001
EU-155	Not Detected	---------	1.06E-001
FE-59	Not Detected	---------	7.85E-002
GD-153	Not Detected	---------	6.33E-002
HG-203	Not Detected	---------	2.90E-002
I-131	Not Detected	---------	3.43E-002
IR-192	Not Detected	---------	2.62E-002
K-40	1.52E+001	2.44E+000	6.05E-001
[redacted]N-52	Not Detected	---------	4.70E-002
[redacted]N-54	Not Detected	---------	3.51E-002
MO-99	Not Detected	---------	5.53E-001
NA-22	Not Detected	---------	4.43E-002
NA-24	Not Detected	---------	1.68E+000
NB-95	Not Detected	---------	1.91E-001
ND-147	Not Detected	---------	2.28E-001
NI-57	Not Detected	---------	2.56E-001
RU-103	Not Detected	---------	2.64E-002
RU-106	Not Detected	---------	2.75E-001
SB-122	Not Detected	---------	8.66E-002
SB-124	Not Detected	---------	2.63E-002
SB-125	Not Detected	---------	6.88E-002
SN-113	Not Detected	---------	3.52E-002
SR-85	Not Detected	---------	3.58E-002
TA-182	Not Detected	---------	1.60E-001
TA-183	Not Detected	---------	2.49E-001
TC-99m	Not Detected	---------	3.26E+002
TL-201	Not Detected	---------	1.85E-001
XE-133	Not Detected	---------	2.30E-001
Y-88	Not Detected	---------	2.77E-002
ZN-65	Not Detected	---------	1.08E-001
ZR-95	Not Detected	---------	5.45E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 8:08:39 AM

* Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044106-004
Lab Sample ID : 90021406

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 727.000 gram
Sample Date/Time : 1/28/99 9:20:00 AM
Acquire Start Date/Time : 1/31/99 9:32:58 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.41E-001
RA-226	1.09E+000	7.66E-001	5.31E-001
PB-214	4.77E-001	3.27E-001	6.37E-002
BI-214	4.23E-001	1.18E-001	4.84E-002
PB-210	Not Detected	---	7.66E+000
TH-232	6.98E-001	3.54E-001	1.28E-001
RA-228	5.64E-001	2.58E-001	1.73E-001
AC-228	7.17E-001	1.96E-001	7.43E-002
TH-228	6.12E-001	2.38E-001	4.48E-001
RA-224	8.05E-001	3.45E-001	9.21E-002
PB-212	6.46E-001	3.28E-001	4.02E-002
BI-212	7.22E-001	4.82E-001	2.90E-001
TL-208	6.06E-001	1.72E-001	7.08E-002
U-235	1.31E-001	1.60E-001	1.88E-001
TH-231	Not Detected	---	6.94E+000
PA-231	Not Detected	---	1.24E+000
TH-227	Not Detected	---	2.81E-001
RA-223	Not Detected	---	1.43E-001
RN-219	Not Detected	---	3.51E-001
PB-211	Not Detected	---	7.78E-001
TL-207	Not Detected	---	1.32E+001
AM-241	Not Detected	---	1.80E-001
PU-239	Not Detected	---	3.43E+002
NP-237	~~4.59E-001~~	~~2.00E-001~~	1.98E-001
PA-233	Not Detected	---	5.65E-002
TH-229	Not Detected	---	1.61E-001

Not detected
2/1/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90021406

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.69E-002
AG-110m	Not Detected	---	5.42E-002
BA-133	Not Detected	---	4.39E-002
BE-7	Not Detected	---	2.52E-001
BI-207	Not Detected	---	2.92E-002
CD-109	Not Detected	---	7.89E-001
CD-115	Not Detected	---	1.88E-001
CE-139	Not Detected	---	2.34E-002
CE-141	Not Detected	---	4.38E-002
CE-144	Not Detected	---	1.81E-001
CO-56	Not Detected	---	3.58E-002
CO-57	Not Detected	---	2.26E-002
CO-58	Not Detected	---	3.21E-002
CO-60	Not Detected	---	3.87E-002
CR-51	Not Detected	---	2.37E-001
CS-134	Not Detected	---	3.10E-002
CS-137	2.42E-001	6.14E-002	2.24E-002
EU-152	Not Detected	---	6.79E-002
EU-154	Not Detected	---	1.80E-001
EU-155	Not Detected	---	1.12E-001
FE-59	Not Detected	---	8.57E-002
GD-153	Not Detected	---	6.46E-002
HG-203	Not Detected	---	2.96E-002
I-131	Not Detected	---	3.71E-002
IR-192	Not Detected	---	2.65E-002
K-40	1.36E+001	2.11E+000	6.49E-001
MN-52	Not Detected	---	5.10E-002
MN-54	Not Detected	---	3.60E-002
MO-99	Not Detected	---	5.76E-001
NA-22	Not Detected	---	4.23E-002
NA-24	Not Detected	---	1.68E+000
NB-95	Not Detected	---	2.00E-001
ND-147	Not Detected	---	2.42E-001
NI-57	Not Detected	---	2.35E-001
RU-103	Not Detected	---	2.77E-002
RU-106	Not Detected	---	2.72E-001
SB-122	Not Detected	---	9.09E-002
SB-124	Not Detected	---	2.75E-002
SB-125	Not Detected	---	8.00E-002
SN-113	Not Detected	---	3.57E-002
SR-85	Not Detected	---	3.71E-002
TA-182	Not Detected	---	1.50E-001
TA-183	Not Detected	---	2.47E-001
TC-99m	Not Detected	---	3.85E+002
TL-201	Not Detected	---	1.94E-001
XE-133	Not Detected	---	2.29E-001
Y-88	Not Detected	---	3.20E-002
ZN-65	Not Detected	---	1.05E-001
ZR-95	Not Detected	---	5.84E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
2/01/99 6:37:45 AM

Analyzed by: 2/1/99 Reviewed by: 2/1/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90021407

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 2/01/99 6:25:17 AM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.71E+003
RA-226	Not Detected	---	5.27E+003
PB-214	Not Detected	---	7.05E+002
BI-214	Not Detected	---	6.45E+002
PB-210	Not Detected	---	6.99E+004
TH-232	Not Detected	---	2.27E+003
RA-228	Not Detected	---	2.95E+003
AC-228	Not Detected	---	1.78E+003
TH-228	Not Detected	---	1.26E+005
RA-224	Not Detected	---	4.49E+003
PB-212	Not Detected	---	9.05E+003
BI-212	Not Detected	---	9.15E+004
TL-208	Not Detected	---	1.96E+004
U-235	Not Detected	---	1.42E+003
TH-231	Not Detected	---	4.38E+004
PA-231	Not Detected	---	1.39E+004
TH-227	Not Detected	---	2.32E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.08E+003
PB-211	Not Detected	---	1.36E+004
TL-207	Not Detected	---	2.55E+005
AM-241	8.27E+004	1.43E+004	1.39E+003
PU-239	Not Detected	---	2.36E+006
NP-237	Not Detected	---	1.33E+003
PA-233	Not Detected	---	6.42E+002
TH-229	Not Detected	---	1.14E+003

[Summary Report] - Sample ID: : 90021407

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.56E+002
AG-110m	Not Detected	---	7.78E+006
BA-133	Not Detected	---	7.71E+002
BE-7	Not Detected	---	3.82E+020
BI-207	Not Detected	---	3.59E+002
CD-109	Not Detected	---	4.11E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	7.27E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.11E+006
CO-56	Not Detected	---	2.48E+014
CO-57	Not Detected	---	3.92E+005
CO-58	Not Detected	---	2.38E+015
CO-60	8.06E+004	1.14E+004	4.52E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.95E+003
CS-137	6.92E+004	9.30E+003	3.13E+002
EU-152	Not Detected	---	8.30E+002
EU-154	Not Detected	---	3.02E+003
EU-155	Not Detected	---	2.61E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	2.57E+006
HG-203	Not Detected	---	8.31E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	5.73E+014
K-40	Not Detected	---	1.42E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	3.32E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.92E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	9.21E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	3.58E+017
SB-125	Not Detected	---	9.15E+003
SN-113	Not Detected	---	3.51E+010
SR-85	Not Detected	---	3.82E+016
TA-182	Not Detected	---	9.63E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	5.87E+010
ZN-65	Not Detected	---	5.06E+006
ZR-95	Not Detected	---	8.83E+016

****
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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report

Report Date	:	2/01/99 6:37:46 AM
QA File	:	C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst	:	FCD
Sample ID	:	90021407
Sample Quantity	:	1.00 Each
Sample Date	:	11/01/90 12:00:00 PM
Measurement Date	:	2/01/99 6:25:17 AM
Elapsed Live Time	:	600 seconds
Elapsed Real Time	:	605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 ACTIVITY	8.548E-002	2.535E-003	8.268E-002	<	:	:	>
CS-137 Activity	6.837E-002	9.849E-004	6.916E-002	<	:	:	>
CO-60 Activity	7.601E-002	2.680E-003	7.800E-002	<	:	:	>

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 2/1/99

001
7527 RAD PRO
01-27-99 WED 13:37 FAX 8113589

Survey Number: S15918

RADIOLOGICAL SURVEY FORM

Location	Requestor/Dept	Date	Time	Duration
ER Site #58B	Mike Young #6134	012799	1130	N/A

Purpose	Request #	RWP #	RPHR #
Release the exterior of soil samples only.	N/A	RWP0309	N/A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP-260/#2883	N/A	John P. Kilbane	John P. Kilbane
Bicron Micro Rem #B973D	N/A	N/A	N/A
N/A	N/A	N/A	N/A

#	Item Description/Location	BETA-GAMMA CONTAMINATION Counting Data Attached ☒ Yes ☐ No %Eff. (cpm)	2O / 3bkg (cpm)	Radionuclide (dpm / 100 cm²(1))	DU (2) T/R/F	ALPHA CONTAMINATION Counting Data Attached ☒ Yes ☐ No %Eff (cpm)	N/A / Bkg (cpm)	Radionuclide (dpm / 100 cm²(1))	DU (2) T/RF	RADIATION SURVEY Bkg. 7 µrem/hr µrem/hr (3)	Distance
1	Sample #'S-044276-001, 044276-002, 044276-003 (1of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
2	Sample #'S-044277-001, 044277-002, 044277-003 (1of2 & 2of2), 044277-004	≤80	80	ND	T				R	≤7	Contact
						N/A					

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW Note (2): Total/Removable/Fixed Note (3): Indicate type, of other than gamma (i.e., n or β).

Remarks

COPY

Reviewed by: Date:

2-4
#515918

****
* Sandia Radioactive Sample Diagnostics Program 1-27-1999 *
****
LSC Analysis Program - version 5.3

Batch Number : 93008104
Count Protocol : 13
Client : ER58B - SAMPLES 1/27/99 JP KILBANE 7523 93008104
Laboratory ID : 6921-2 S/N 405921
Count Date : 27-Jan-99
Protocol Name : H3AB SWIPE
Region of Interest : 0-12
Count Time : 5.0 minutes
Background cpm : 19.80 +- 4.06
Background tSIE : 459.9
Background Eff : 0.412
Systematic Error : 12.90%
Sample Aliquot : 1.000 f

H-3 MDA = 2.38E+01 dpm/f
H-3 CL = 1.13E+01 dpm/f

H-3 Efficiency = 0.9740 - exp(-0.00047*tSIE^1.1600)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: R T Preston 1/27/99 Reviewed by: R T Preston 1/27/99

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity dpm/f	Error	Flag
2	001	001	2.06E+01	4.54E+00	425	0.383	2.09E+00	2.28E+01	<CL
3	002	002	1.96E+01	4.27E+00	430	0.387	-5.17E-01	2.16E+01	<CL

COPY

3-4
#515918

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program          1-27-1999 *
**********************************************************************
LSC Analysis Program - version 5.3

Batch Number        : 93008104
Count Protocol      : 13
Client              : ER58B - SAMPLES 1/27/99 JP KILBANE 7523   93008104
Laboratory ID       : 6921-2  S/N 405921
Count Date          : 27-Jan-99
Protocol Name       : H3AB -- SWIPE
Region of Interest  : 20-600
Count Time          : 5.0 minutes
Background cpm      : 7.40 +- 2.43
Background tSIE     : 459.9
Background Eff      : 1.039
Systematic Error    :  8.90%
Sample Aliquot      : 1.000 f

Alpha MDA =  5.98E+00 dpm/f
Alpha CL  =  2.73E+00 dpm/f

Alpha Efficiency = 1.0390 - exp(-0.00990*tSIE^1.1780)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity dpm/f	Error	Flag
2	001	001	7.00E+00	2.37E+00	425	1.039	-3.85E-01	4.65E+00	<CL
3	002	002	5.80E+00	3.15E+00	430	1.039	-1.54E+00	4.55E+00	<CL

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4 - 4

#515918

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program            1-27-1999 *
**********************************************************************
LSC Analysis Program - version 5.3

Batch Number          : 93008104
Count Protocol        : 13
Client                : ER58B - SAMPLES 1/27/99 JP KILBANE 7523   93008104
Laboratory ID         : 6921-2  S/N 405921
Count Date            : 27-Jan-99
Protocol Name         : H3AB -- SWIPE
Region of Interest    : 12-2000
Count Time            : 5.0 minutes
Background cpm        : 34.20 +- 5.23
Background tSIE       : 459.9
Background Eff        : 0.841
Systematic Error      :  6.30%
Sample Aliquot        : 1.000 f

Beta MDA =  1.51E+01 dpm/f
Beta CL  =  7.25E+00 dpm/f

Beta Efficiency = 0.8410 - exp(-0.01319*tSIE^1.1040)

Flag Description:

>CL : Result > 2 sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
&CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
2	001	001	3.94E+01	5.61E+00	425	0.841	6.18E+00	1.33E+01	<CL
3	002	002	3.94E+01	5.61E+00	430	0.841	6.18E+00	1.33E+01	<CL

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001
7527 RAD PRO
01 29 99 FRI 09:09 FAX 5113559

Survey Number: S16043

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept.	Date	Time	Duration
ER Site #58	Mike Young #6134	012899	1100	N/A

Purpose	Request #	RWP #	RFIR #
Release the exterior of soil samples only and equipment used for sampling.	N/A	RWP0309	N/A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP_260/#2883	N/A	John P. Kilbane	
Bicron Micro Rem #B230L	N/A	N/A	N/A
N/A	N/A	N/A	N/A

#	Item Description/Location	BETA-GAMMA CONTAMINATION (Counting Data Attached ☒ Yes ☐ No) %Eff. cpm	2σ Bkg cpm	dpm/100 cm² Radionuclide	DU (2) T/RF	ALPHA CONTAMINATION (Counting Data Attached ☒ Yes ☐ No) %Eff. cpm	N/A Bkg cpm	dpm/100 cm² Radionuclide	DU (2) T/RF	RADIATION SURVEY Bkg. µrem/hr (3)	µrem/hr Distance
1	Sample #'S=044103-001, 044103-004	≤80	80	ND	T				R	≤7	Contact
2	Sample #'S=044105-001, 044105-004	≤80	80	ND	T				R	≤7	Contact
3	Sample #'S=044106-001, 044106-004	≤80	80	ND	T				R	≤7	Contact
4	Sample #'S=044104-001, 044104-004	≤80	80	ND	T				R	≤7	Contact
5	(2) garden trowels	≤80	80	ND	T				R		
6	Round nose shovel	≤80	80	ND	T				R		
7	Small steel sampling tube	≤80	80	ND	T				R		
8	Small steel sampling tube	≤80	80	ND	T				R		
9	Small steel sampling tube	≤80	80	ND	T				R		
10	Small steel sampling tube	≤80	80	ND	T				R		
11	Small steel sampling tube	≤80	80	ND	T				R		
12	Small steel sampling tube	≤80	80	ND	T				R		
13	Large steel sampling tube	≤80	80	ND	T				R		
14	Large steel sampling tube	≤80	80	ND	T				R		
15	Large steel sampling tube	≤80	80	ND	T				R		

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW Note (2): Total/Removable/Fixed Note (3): Indicate type, if other than gamma (i.e., β or ñ).

Remarks

Reviewed by: Date:

002

7527 RAD PRO

01 29 99 FRI 09:19 FAX 8113559

Survey #S16043

RADIOLOGICAL SURVEY FORM CONTINUATION

#	Item Description/Location	BETA-GAMMA ACTIVITY				ALPHA ACTIVITY				RADIATION SURVEY	
		cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) TMR#	cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) TMR#	µrem/hr (3)	Distance
16	Mixing bowl #1	<80	80	ND	T				R		
17	Mixing bowl #2	<80	80	ND	T				R		

(1) If area other than 100 cm², record as dpm/probe, or cpm/ AW. (2) Trend/Removable/Fixed (3) Indicate type, if other than gamma (i.e., n, α, β)

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program              1-29-1999 *
**********************************************************************
LSC Analysis Program - version 5.3
```

3-8
#816043

```
Batch Number        : 93008501
Count Protocol      : 1
Client              : ER58 SAMPLE EQUIP. 1/28/99 JPKILBANE 7523 93008501
Laboratory ID       : 6921 - S#411293
Count Date          : 28-Jan-99
Protocol Name       : H3AB -- SWIPE
Region of Interest  : 0-12
Count Time          : 5.0 minutes
Background cpm      : 24.60 +  5.81
Background tSIE     : 463.6
Background Eff      : 0.415
Systematic Error    : 12.90%
Sample Aliquot      : 1.000 f

H-3 MDA =  2.62E+01 dpm/f
H-3 CL  -  1.25E+01 dpm/f

H 3 Efficiency = 0.9740   exp( 0.00047*tSIE^1.1600)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

Analyzed by: RT Preston 1/29/99 Reviewed by: RT Preston 1/29/99

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity dpm/f	Error	Flag
2	001	001	3.22E+01	5.75E+00	456	0.408	-5.88E+00	2.91E+01	<CL
3	002	002	2.22E+01	5.29E+00	443	0.398	-6.03E+00	2.87E+01	<CL
4	003	003	2.40E+01	5.31E+00	444	0.398	-1.51E+00	2.81E+01	<CL
5	004	004	2.22E+01	4.98E+00	453	0.406	-5.91E+00	2.73E+01	<CL
6	005	005	2.82E+01	5.38E+00	433	0.390	9.24E+00	2.99E+01	<CL
7	006	006	1.92E+01	4.53E+00	386	0.349	-1.55E+01	3.16E+01	<CL
8	007	007	1.96E+01	4.19E+00	254	0.225	-2.22E+01	4.73E+01	<CL
9	008	008	1.78E+01	4.25E+00	384	0.347	-1.96E+01	3.15E+01	<CL
10	009	009	2.26E+01	4.58E+00	321	0.290	-6.90E+00	3.67E+01	<CL
11	010	010	1.76E+01	4.00E+00	262	0.233	-3.00E+01	4.59E+01	<CL
12	011	011	1.96E+01	4.27E+00	281	0.251	-1.99E+01	4.27E+01	<CL
13	012	012	2.38E+01	4.47E+00	221	0.192	-4.16E+00	5.40E+01	<CL
14	013	013	2.12E+01	4.49E+00	376	0.340	-1.00E+01	3.26E+01	<CL
15	014	014	2.19E+01	4.47E+00	334	0.302	9.29E+00	3.53E+01	<CL

****
* Sandia Radioactive Sample Diagnostics Program 1-29-1999 *
****

Batch Number: 93008501

4-8
#516043

S#	RPSD ID	Client ID	cpm	Error	tSIR	Eff	H-3 Activity dpm/f	Error	Flag
16	015	015	1.72E+01	4.12E+00	359	0.324	-2.28E+01	3.36E+01	<CL
17	016	016	2.12E+01	4.49E+00	369	0.334	-1.02E-01	3.22E+01	<CL
18	017	017	1.76E+01	4.00E+00	384	0.347	2.01E-01	3.08E-01	<CL

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program              1-29-1999 *
**********************************************************************
LSC Analysis Program - version 5.3
```

5-8
#516043

```
Batch Number          : 93008501
Count Protocol        : 1
Client                : ER58 SAMPLE EQUIP. 1/28/99 JPKILBANE 7523 93008501
Laboratory ID         : 6921 - S#411293
Count Date            : 28-Jan-99
Protocol Name         : H3AB -- SWIPE
Region of Interest    : 20-600
Count Time            : 5.0 minutes
Background cpm        : 3.40 +- 1.65
Background tSIE       : 463.6
Background Eff        : 1.039
Systematic Error      :  8.90%
Sample Aliquot        : 1.000 f

Alpha MDA =  4.22E+00 dpm/f
Alpha CL  =  1.95E+00 dpm/f

Alpha Efficiency = 1.0390 - exp(-0.00990*tSIE^1.1700)

Flag Description:

>CL : Result > 2 sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity dpm/f	Error	Flag
2	001	001	3.80E-00	1.74E+00	456	1.039	3.85E-01	3.30E+00	<CL
3	002	002	2.80E-00	1.50E-00	443	1.039	-5.77E-01	3.08E+00	<CL
4	003	003	3.00E+00	1.55E-00	444	1.039	-3.85E-01	3.11E+00	<CL
5	004	004	3.20E-00	1.60E-00	453	1.039	-1.92E 01	3.14E+00	<CL
6	005	005	2.20E-00	1.33E+00	433	1.039	-1.15E+00	2.97E+00	<CL
7	006	006	2.20E+00	1.33E-00	366	1.039	1.15E+00	2.97E+00	<CL
8	007	007	1.20E+00	9.80E-01	254	1.038	-2.12E+00	2.72E+00	<CL
9	008	008	2.60E+00	1.44E+00	304	1.039	-7.70E-01	3.04E+00	<CL
10	009	009	1.80E+00	1.20E+00	321	1.039	-1.54E+00	2.88E+00	<CL
11	010	010	3.20E+00	1.60E+00	262	1.038	-1.93E-01	3.15E+00	<CL
12	011	011	3.40E+00	1.65E+00	281	1.038	0.00E+00	3.18E+00	<CL
13	012	012	1.40E+00	1.06E+00	221	1.036	-1.93E+00	2.79E+00	<CL
14	013	013	2.20E+00	1.33E+00	376	1.039	-1.15E+00	2.97E+00	<CL
15	014	014	3.60E+00	1.70E+00	334	1.039	1.93E-01	3.24E+00	<CL

****
* Sandia Radioactive Sample Diagnostics Program 1-29-1999 *
****

Batch Number: 93008501

6-8
#S 16043

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity cpm/f	Alpha Activity Error	Flag
16	015	015	3.00E+00	1.55E+00	359	1.039	-3.85E-01	3.11E+00	<CL
17	016	016	1.80E+00	1.20E+00	369	1.039	-1.54E+00	2.88E+00	<CL
18	017	017	3.00E+00	1.55E+00	384	1.039	-3.85E-01	3.11E+00	<CL

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program              1-29-1999 *
**********************************************************************
LSC Analysis Program - version 5.3

Batch Number          : 93008501
Count Protocol        : 7
Client                : ER58 SAMPLE EQUIP. 1/28/99 JPKILBANE 7523 93008501
Laboratory ID         : 6921 - S#411293
Count Date            : 28-Jan-99
Protocol Name         : H3AB     SWIPE
Region of Interest    : 12-2000
Count Time            : 5.0 minutes
Background cpm        : 49.00 +- 6.26
Background tSIE       : 463.6
Background Eff        : 0.841
Systematic Error      :  6.30%
Sample Aliquot        : 1.000 f

Beta MDA =  1.80E+01 dpm/f
Beta CL  =  8.67E+00 dpm/f

Beta Efficiency = 0.8410 - exp(-0.01319*tSIE^1.1040)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
?CL : Result < 2-sigma Error  and  Result > Critical Level.
?CL : Result > 2-sigma Error  and  Result < Critical Level.
```

1-8
#516043

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
2	001	001	4.04E+01	5.08E-00	456	0.841	-1.02E+01	1.48E+01	<CL
3	002	002	4.32E+01	5.88E-00	443	0.841	-6.90E+00	1.49E+01	<CL
4	003	003	4.20E+01	5.80E+00	444	0.841	-8.32E+00	1.49E+01	<CL
5	004	004	3.82E+01	5.53E+00	457	0.841	-1.28E+01	1.48E+01	<CL
6	005	005	4.14E+01	5.75E+00	433	0.841	-9.04E+00	1.49E+01	<CL
7	006	006	4.32E+01	5.88E+00	386	0.841	-6.90E+00	1.49E+01	<CL
8	007	007	4.22E+01	5.81E+00	254	0.838	-8.11E+00	1.49E+01	<CL
9	008	008	4.08E+01	5.71E+00	384	0.841	-9.75E+00	1.49E+01	<CL
10	009	009	4.92E+01	6.27E+00	321	0.841	2.36E-01	1.49E+01	<CL
11	010	010	4.68E+01	6.12E+00	262	0.839	-2.62E+00	1.49E+01	<CL
12	011	011	5.22E+01	6.46E+00	281	0.840	3.81E+00	1.54E+01	<CL
13	012	012	4.20E+01	5.80E+00	221	0.835	-8.35E+00	1.50E+01	<CL
14	013	013	4.14E+01	5.75E+00	376	0.841	-9.04E+00	1.49E+01	<CL
15	014	014	4.16E+01	5.70E+00	334	0.841	-8.56E+00	1.49E+01	<CL

****
* Sandia Radioactive Sample Diagnostics Program 1-29-1999 *
****

Batch Number: 93008501

8-8
#S16043

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
16	015	015	4.76E-01	8.17E+00	359	0.841	-1.67E+00	1.49E+01	<CL
17	016	016	4.16E-01	5.77E-00	369	0.841	-9.80E+00	1.49E+01	<CL
18	017	017	4.16E-01	5.77E+00	384	0.841	-8.80E+00	1.49E+01	<CL

Feature 58UU

Internal Lab

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Batch No. 000465 SAR/WR No. SMO Use

AR/COC **603141**

Dept. No./Mail Stop:	6134/MS1087	[redacted]		Contract No.:	N/A
Project/Task Manager:	Byrd/Mignardot	[redacted]		Case No.:	7213.02.02.01
Project Name:	ER Site 58:Firebrick Area 3	Lab Contact:	F Dominguez 844-7683	SMO Authorization:	
Record Center Code:	ER/1332/S58/3-00/Sampling	Lab Destination:	RPSD	Bill To: Sandia National Laboratories	
Logbook Ref. No.:	70	SMO Contact/Phone:	D Salmi 844-3110	Supplier Services Dept.:	
Service Order No.	CFO 030	Send Report to SMO:	S Jensen 844-3184	P.O. Box 5800 MS 0154	
Location	Tech Area				
Building	Room	**Reference LOV(available at SMO)**			

	Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preser-vative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Lab Sample ID
a	051436-002	S58FB3-GR-005-0-SS	0	58	030900 0950	s	M	16oz	none	G	SA	Gamma Spec	[redacted]
b	051437-002	S58FB3-GR-006-0-SS	0	58	030900 0949	s	M	16oz	none	G	SA	Gamma Spec	
c	051438-002	S58FB3-GR-007-0-SS	0	58	030900 0959	s	M	16oz	none	G	SA	Gamma Spec	
d	051439-002	S58FB3-GR-008-0-SS	0	58	030900 1001	s	M	16oz	none	G	SA	Gamma Spec	
e	051440-002	S58FB3-GR-009-0-SS	0	58	030900 1015	s	M	16oz	none	G	SA	Gamma Spec	
f	051441-002	S58FB3-GR-010-0-SS	0	58	030900 1002	s	M	16oz	none	G	SA	Gamma Spec	
g	051442-002	S58FB3-GR-011-0-SS	0	58	030900 1010	s	M	16oz	none	G	SA	Gamma Spec	
h	051443-002	S58FB3-GR-012-0-SS	0	58	030900 1018	s	M	16oz	none	G	SA	Gamma Spec	
i	051444-002	S58FB3-GR-013-0-SD	0	58	030900 1015	s	M	16oz	none	G	SA	Gamma Spec	

RMMA ☒ Yes ☐ No Ref. No. [redacted]

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush

Required Report Date

Special Instructions/QC Requirements

EDD ☒ Yes ☐ No

Raw Data Package ☒ Yes ☐ No

Send results to E Mignardot

Releases COC 603140

Please list as separate report.

	Name	Signature	Init	Company/Organization/Phone
Sample Team Members	M Sanchez	M Sanchez	MS	Weston/6135/845-3267
	~~W Gibson~~			~~MDM/6135/845-3267~~
	G Catechis	G. Catechis	GC	MDM/6135/845-3267

1.Relinquished by	Margaret Sanchez	Org. 6135	Date 3-14-00	Time 1105	4.Relinquished by	Org.	Date	Time
1. Received by	[signature]	Org. 6133	Date 3-14-00	Time 1105	4. Received by	Org.	Date	Time
2.Relinquished by	[signature]	Org. 6133	Date 3-14-00	Time 1355	5.Relinquished by	Org.	Date	Time
2. Received by	[signature]	Org. 7132	Date 3-14-00	Time 1355	5. Received by	Org.	Date	Time
3.Relinquished by	[signature]	Org. 7132	Date 3/15/00	Time 1530	6.Relinquished by	Org.	Date	Time
3. Received by	[signature]	Org. 6133	Date 3/15/00	Time 1530	6. Received by	Org.	Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded ares are for RPSD use only

Customer:	E Mignardot
Organization:	6134
Project Location:	Site 58 Firebrick Area 3
Phone:	284-3733
Date Results Needed:	ASAP
Suspect Isotopes:	Gamma
Case number:	7213.02.02.01

Hazards/ Special Instructions:
100 mR/h.
COC 603141
EDD
Releases COC 603140
845-0867
CALL D. PERRY

Batch Log Number: 000465
Logged By:
Analysis Type:
- ☒ Gamma Spec
- ☐ H-3
- ☐ Alpha/ Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

	Customer Sample ID	Sample Type	Date/Time Collection	Sample Quantity	Requested Analysis	RPSD Sample ID	Screen cpm	Sample Mass (g)	Remarks / Aliquot Amount MASS
1	051436-002	soil	030900 0950	16oz	Gamma Spec	01	<300	~~703~~	568
2	051437-002	soil	030900 0949	16oz	Gamma Spec	02		~~468~~	833
3	051438-002	soil	030900 0959	16oz	Gamma Spec	03		~~671~~	536
4	051439-002	soil	030900 1001	16oz	Gamma Spec	04		~~751~~	616
5	051440-002	soil	030900 1015	16oz	Gamma Spec	05		~~878~~	743
6	051441-002	soil	030900 1002	16oz	Gamma Spec	06		~~706~~	571
7	051442-002	soil	030900 1010	16oz	Gamma Spec	07		~~804~~	669
8	051443-002	soil	030900 1018	16oz	Gamma Spec	08		~~640~~	505
9	051444-002	soil	030900 1015	16oz	Gamma Spec	09		~~884~~	749
10	LCS					10			
11									
12									
13									
14									
15									

Relinquished by		Date	3-14-00
Relinquished by		Date	3/15/00
Relinquished by		Date	
Relinquished by		Date	
Relinquished by		Date	

Received by		Date	3-14-00
Received by		Date	3/15/00
Received by		Date	
Received by		Date	
Received by		Date	

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/14/00 6:42:14 PM

Analyzed by: 3/15/00 Reviewed by: 3/15/00

Customer : E.MIGNARDOT (6134)
Customer Sample ID : 051436-002
Lab Sample ID : 00046501

Sample Description : SOIL IN MARINELLI BEAKER
Sample Quantity : 568.000 gram
Sample Date/Time : 3/09/00 9:50:00 AM
Acquire Start Date/Time : 3/14/00 5:02:01 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.95E-001
RA-226	1.50E+000	7.45E-001	5.86E-001
PB-214	5.82E-001	1.27E-001	4.84E-002
BI-214	5.31E-001	1.39E-001	4.43E-002
PB-210	Not Detected	---	3.71E+001
TH-232	7.05E-001	3.69E-001	1.68E-001
RA-228	6.53E-001	2.30E-001	1.45E-001
AC-228	7.49E-001	2.03E-001	7.22E-002
TH-228	4.29E-001	4.66E-001	5.26E-001
RA-224	6.68E-001	1.61E-001	5.31E-002
PB-212	7.20E-001	4.16E-001	4.26E-002
BI-212	7.93E-001	9.36E-001	2.70E-001
TL-208	6.92E-001	1.56E-001	6.62E-002
U-235	Not Detected	---	2.26E-001
TH-231	Not Detected	---	1.22E+001
PA-231	Not Detected	---	1.45E+000
TH-227	Not Detected	---	3.77E-001
RA-223	Not Detected	---	2.66E-001
RN-219	Not Detected	---	3.73E-001
PB-211	Not Detected	---	8.32E-001
TL-207	Not Detected	---	1.26E+001
AM-241	Not Detected	---	5.18E-001
PU-239	Not Detected	---	4.19E+002
NP-237	Not Detected	---	2.29E+000
PA-233	Not Detected	---	5.98E-002
TH-229	Not Detected	---	2.47E-001

[Summary Report] - Sample ID: : 00046501

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.69E-002
AG-110m	Not Detected	---	7.74E-002
BA-133	Not Detected	---	4.81E-002
BE-7	Not Detected	---	2.89E-001
CD-115	Not Detected	---	3.42E-001
CE-139	Not Detected	---	2.85E-002
CE-141	Not Detected	---	5.51E-002
CE-144	Not Detected	---	2.32E-001
CO-56	Not Detected	---	3.39E-002
CO-57	Not Detected	---	3.05E-002
CO-58	Not Detected	---	3.20E-002
CO-60	Not Detected	---	3.47E-002
CR-51	Not Detected	---	2.71E-001
CS-134	Not Detected	---	4.29E-002
CS-137	6.48E-001	1.06E-001	2.40E-002
EU-152	Not Detected	---	8.98E-002
EU-154	Not Detected	---	1.78E-001
EU-155	Not Detected	---	1.39E-001
FE-59	Not Detected	---	6.76E-002
GD-153	Not Detected	---	1.04E-001
HG-203	Not Detected	---	3.41E-002
I-131	Not Detected	---	4.44E-002
IR-192	Not Detected	---	2.99E-002
K-40	1.47E+001	2.02E+000	2.56E-001
MN-52	Not Detected	---	5.66E-002
MN-54	Not Detected	---	3.57E-002
MO-99	Not Detected	---	7.94E-001
NA-22	Not Detected	---	3.94E-002
NA-24	Not Detected	---	1.26E+001
NB-95	Not Detected	---	4.61E-001
ND-147	Not Detected	---	2.65E-001
NI-57	Not Detected	---	5.87E-001
RU-103	Not Detected	---	3.13E-002
RU-106	Not Detected	---	2.84E-001
SB-122	Not Detected	---	1.51E-001
SB-124	Not Detected	---	3.08E-002
SB-125	Not Detected	---	8.66E-002
SN-113	Not Detected	---	3.86E-002
SR-85	Not Detected	---	3.91E-002
TA-182	Not Detected	---	1.53E-001
TA-183	Not Detected	---	9.25E-001
TL-201	Not Detected	---	6.11E-001
XE-133	Not Detected	---	7.51E-001
Y-88	Not Detected	---	2.30E-002
ZN-65	Not Detected	---	1.01E-001
ZR-95	Not Detected	---	5.55E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/14/00 8:24:09 PM

Analyzed by: 3/15/00 Reviewed by: 3/15/00

Customer : E.MIGNARDOT (6134)
Customer Sample ID : 051437-002
Lab Sample ID : 00046502

Sample Description : SOIL IN MARINELLI BEAKER
Sample Quantity : 833.000 gram
Sample Date/Time : 3/09/00 9:49:00 AM
Acquire Start Date/Time : 3/14/00 6:43:56 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.81E-001
RA-226	1.23E+000	6.39E-001	3.88E-001
PB-214	4.44E-001	1.04E-001	3.83E-002
BI-214	4.08E-001	1.34E-001	3.40E-002
PB-210	Not Detected	---	2.70E+001
TH-232	5.59E-001	3.08E-001	1.05E-001
RA-228	6.56E-001	2.51E-001	9.14E-002
AC-228	6.53E-001	1.66E-001	5.58E-002
TH-228	6.65E-001	4.10E-001	3.12E-001
RA-224	5.80E-001	1.34E-001	4.58E-002
PB-212	5.85E-001	3.98E-001	2.98E-002
BI-212	7.94E-001	2.15E-001	2.15E-001
TL-208	5.95E-001	1.14E-001	3.85E-002
U-235	7.37E-002	1.35E-001	1.73E-001
TH-231	Not Detected	---	9.46E+000
PA-231	Not Detected	---	9.85E-001
TH-227	Not Detected	---	2.77E-001
RA-223	Not Detected	---	2.02E-001
RN-219	Not Detected	---	2.76E-001
PB-211	Not Detected	---	6.27E-001
TL-207	Not Detected	---	9.45E+000
AM-241	Not Detected	---	3.89E-001
PU-239	Not Detected	---	3.27E+002
NP-237	Not Detected	---	1.77E+000
PA-233	Not Detected	---	4.33E-002
TH-229	Not Detected	---	1.89E-001

[Summary Report] - Sample ID: : 00046502

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	2.89E-002
AG-110m	Not Detected	---------	3.98E-002
BA-133	Not Detected	---------	3.48E-002
BE-7	Not Detected	---------	1.91E-001
CD-115	Not Detected	---------	2.54E-001
CE-139	Not Detected	---------	2.13E-002
CE-141	Not Detected	---------	4.16E-002
CE-144	Not Detected	---------	1.82E-001
CO-56	Not Detected	---------	2.57E-002
CO-57	Not Detected	---------	2.27E-002
CO-58	Not Detected	---------	2.26E-002
CO-60	Not Detected	---------	2.77E-002
CR-51	Not Detected	---------	1.90E-001
CS-134	Not Detected	---------	3.15E-002
CS-137	1.96E-001	4.65E-002	1.78E-002
EU-152	Not Detected	---------	6.77E-002
EU-154	Not Detected	---------	1.39E-001
EU-155	Not Detected	---------	1.07E-001
FE-59	Not Detected	---------	5.42E-002
GD-153	Not Detected	---------	8.06E-002
HG-203	Not Detected	---------	2.43E-002
I-131	Not Detected	---------	3.20E-002
IR-192	Not Detected	---------	2.06E-002
K-40	1.32E+001	1.79E+000	1.59E-001
MN-52	Not Detected	---------	4.09E-002
MN-54	Not Detected	---------	2.67E-002
MO-99	Not Detected	---------	6.30E-001
NA-22	Not Detected	---------	3.02E-002
NA-24	Not Detected	---------	8.69E+000
NB-95	Not Detected	---------	3.43E-001
ND-147	Not Detected	---------	1.98E-001
NI-57	Not Detected	---------	4.64E-001
RU-103	Not Detected	---------	2.31E-002
RU-106	Not Detected	---------	1.99E-001
SB-122	Not Detected	---------	1.16E-001
SB-124	Not Detected	---------	2.19E-002
SB-125	Not Detected	---------	5.99E-002
SN-113	Not Detected	---------	2.72E-002
SR-85	Not Detected	---------	2.88E-002
TA-182	Not Detected	---------	1.14E-001
TA-183	Not Detected	---------	6.89E-001
TL-201	Not Detected	---------	4.73E-001
XE-133	Not Detected	---------	5.96E-001
Y-88	Not Detected	---------	1.89E-002
ZN-65	Not Detected	---------	7.40E-002
ZR-95	Not Detected	---------	4.12E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/14/00 10:06:04 PM

Analyzed by: 3/15/00 Reviewed by: 3/15/00

ustomer : E.MIGNARDOT (6134)
ustomer Sample ID : 051438-002
ab Sample ID : 00046503

ample Description : SOIL IN MARINELLI BEAKER
ample Quantity : 536.000 gram
ample Date/Time : 3/09/00 9:59:00 AM
cquire Start Date/Time : 3/14/00 8:25:51 PM
etector Name : LAB02
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	8.27E-001
RA-226	Not Detected	---------	6.01E-001
PB-214	6.48E-001	1.12E+000	5.00E-002
BI-214	5.97E-001	1.45E-001	5.13E-002
PB-210	Not Detected	---------	3.93E+001
TH-232	8.18E-001	4.49E-001	1.61E-001
RA-228	9.62E-001	3.26E-001	1.38E-001
AC-228	8.37E-001	2.15E-001	8.01E-002
TH-228	8.43E-001	9.37E-001	4.60E-001
RA-224	8.10E-001	1.91E-001	7.38E-002
PB-212	Not Detected	---------	4.63E-002
BI-212	9.24E-001	9.55E-001	2.88E-001
TL-208	7.30E-001	1.87E-001	6.89E-002
U-235	Not Detected	---------	2.40E-001
TH-231	Not Detected	---------	1.28E+001
PA-231	Not Detected	---------	1.49E+000
TH-227	Not Detected	---------	3.99E-001
RA-223	Not Detected	---------	2.82E-001
RN-219	Not Detected	---------	4.23E-001
PB-211	Not Detected	---------	9.26E-001
TL-207	Not Detected	---------	1.24E+001
AM-241	Not Detected	---------	5.44E-001
PU-239	Not Detected	---------	4.49E+002
NP-237	Not Detected	---------	2.51E+000
PA-233	Not Detected	---------	6.26E-002
TH-229	Not Detected	---------	2.69E-001

[Summary Report] - Sample ID: : 00046503

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.99E-002
AG-110m	Not Detected	---------	8.03E-002
BA-133	Not Detected	---------	5.22E-002
BE-7	Not Detected	---------	3.11E-001
CD-115	Not Detected	---------	3.85E-001
CE-139	Not Detected	---------	3.07E-002
CE-141	Not Detected	---------	5.81E-002
CE-144	Not Detected	---------	2.41E-001
CO-56	Not Detected	---------	3.40E-002
CO-57	Not Detected	---------	3.19E-002
CO-58	Not Detected	---------	3.39E-002
CO-60	Not Detected	---------	3.65E-002
CR-51	Not Detected	---------	2.77E-001
CS-134	Not Detected	---------	4.48E-002
CS-137	6.59E-001	1.11E-001	2.40E-002
EU-152	Not Detected	---------	9.48E-002
EU-154	Not Detected	---------	1.89E-001
EU-155	Not Detected	---------	1.53E-001
FE-59	Not Detected	---------	7.04E-002
GD-153	Not Detected	---------	1.12E-001
HG-203	Not Detected	---------	3.55E-002
I-131	Not Detected	---------	4.63E-002
IR-192	Not Detected	---------	3.00E-002
K-40	1.61E+001	2.20E+000	2.58E-001
MN-52	Not Detected	---------	5.90E-002
MN-54	Not Detected	---------	3.61E-002
MO-99	Not Detected	---------	8.92E-001
NA-22	Not Detected	---------	4.06E-002
NA-24	Not Detected	---------	1.40E+001
NB-95	Not Detected	---------	4.96E-001
ND-147	Not Detected	---------	2.93E-001
NI-57	Not Detected	---------	6.74E-001
RU-103	Not Detected	---------	3.23E-002
RU-106	Not Detected	---------	2.96E-001
SB-122	Not Detected	---------	1.72E-001
SB-124	Not Detected	---------	3.27E-002
SB-125	Not Detected	---------	8.98E-002
SN-113	Not Detected	---------	4.32E-002
SR-85	Not Detected	---------	4.13E-002
TA-182	Not Detected	---------	1.60E-001
TA-183	Not Detected	---------	9.65E-001
TL-201	Not Detected	---------	6.72E-001
XE-133	Not Detected	---------	8.16E-001
Y-88	Not Detected	---------	2.84E-002
ZN-65	Not Detected	---------	1.06E-001
ZR-95	Not Detected	---------	5.78E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/14/00 11:47:58 PM

Analyzed by: 3/15/00 Reviewed by: 3/15/00

Customer : E.MIGNARDOT (6134)
Customer Sample ID : 051439-002
Lab Sample ID : 00046504

Sample Description : SOIL IN MARINELLI BEAKER
Sample Quantity : 616.000 gram
Sample Date/Time : 3/09/00 10:01:00 AM
Acquire Start Date/Time : 3/14/00 10:07:46 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.38E-001
RA-226	1.43E+000	3.92E-001	6.59E-001
PB-214	Not Detected	---	4.41E-002
BI-214	5.30E-001	1.26E-001	4.39E-002
PB-210	Not Detected	---	3.53E+001
TH-232	7.74E-001	4.16E-001	1.24E-001
RA-228	7.63E-001	3.37E-001	1.23E-001
AC-228	8.15E-001	2.25E-001	7.54E-002
TH-228	Not Detected	---	6.77E-001
RA-224	8.75E-001	1.97E-001	6.55E-002
PB-212	7.62E-001	1.19E-001	3.67E-002
BI-212	9.80E-001	4.73E-001	2.88E-001
TL-208	7.04E-001	1.23E-001	6.16E-002
U-235	Not Detected	---	2.22E-001
TH-231	Not Detected	---	1.18E+001
PA-231	Not Detected	---	1.35E+000
TH-227	Not Detected	---	3.56E-001
RA-223	Not Detected	---	2.59E-001
RN-219	Not Detected	---	3.47E-001
PB-211	Not Detected	---	7.78E-001
TL-207	Not Detected	---	1.21E+001
AM-241	Not Detected	---	4.94E-001
PU-239	Not Detected	---	4.04E+002
NP-237	Not Detected	---	2.28E+000
PA-233	Not Detected	---	5.28E-002
TH-229	Not Detected	---	2.29E-001

[Summary Report] - Sample ID: : 00046504

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.64E-002
AG-110m	Not Detected	---	4.32E-002
BA-133	Not Detected	---	4.67E-002
BE-7	Not Detected	---	2.39E-001
CD-115	Not Detected	---	3.42E-001
CE-139	Not Detected	---	2.63E-002
CE-141	Not Detected	---	5.35E-002
CE-144	Not Detected	---	2.20E-001
CO-56	Not Detected	---	3.15E-002
CO-57	Not Detected	---	2.94E-002
CO-58	Not Detected	---	3.07E-002
CO-60	Not Detected	---	3.23E-002
CR-51	Not Detected	---	2.43E-001
CS-134	Not Detected	---	4.12E-002
CS-137	1.35E-001	4.68E-002	2.33E-002
EU-152	Not Detected	---	8.73E-002
EU-154	Not Detected	---	1.74E-001
EU-155	Not Detected	---	1.32E-001
FE-59	Not Detected	---	7.02E-002
GD-153	Not Detected	---	9.45E-002
HG-203	Not Detected	---	3.17E-002
I-131	Not Detected	---	4.14E-002
IR-192	Not Detected	---	2.68E-002
K-40	1.56E+001	2.13E+000	2.22E-001
MN-52	Not Detected	---	5.10E-002
MN-54	Not Detected	---	3.26E-002
MO-99	Not Detected	---	8.18E-001
NA-22	Not Detected	---	3.75E-002
NA-24	Not Detected	---	1.33E+001
NB-95	Not Detected	---	4.47E-001
ND-147	Not Detected	---	2.55E-001
NI-57	Not Detected	---	5.29E-001
RU-103	Not Detected	---	2.91E-002
RU-106	Not Detected	---	2.62E-001
SB-122	Not Detected	---	1.52E-001
SB-124	Not Detected	---	2.93E-002
SB-125	Not Detected	---	7.34E-002
SN-113	Not Detected	---	3.64E-002
SR-85	Not Detected	---	3.64E-002
TA-182	Not Detected	---	1.40E-001
TA-183	Not Detected	---	8.97E-001
TL-201	Not Detected	---	6.01E-001
XE-133	Not Detected	---	7.50E-001
Y-88	Not Detected	---	2.77E-002
ZN-65	Not Detected	---	9.69E-002
ZR-95	Not Detected	---	5.45E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/15/00 1:29:53 AM

Analyzed by: 3/15/00 Reviewed by: 3/15/00

Customer : E.MIGNARDOT (6134)
Customer Sample ID : 051440-002
Lab Sample ID : 00046505

Sample Description : SOIL IN MARINELLI BEAKER
Sample Quantity : 743.000 gram
Sample Date/Time : 3/09/00 10:15:00 AM
Acquire Start Date/Time : 3/14/00 11:49:40 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.82E-001
RA-226	1.38E+000	2.11E+000	4.18E-001
PB-214	5.83E-001	1.20E-001	4.00E-002
BI-214	5.27E-001	1.61E-001	3.73E-002
PB-210	Not Detected	---------	2.92E+001
TH-232	Not Detected	---------	1.17E-001
RA-228	7.62E-001	2.60E-001	1.17E-001
AC-228	6.56E-001	1.94E-001	6.74E-002
TH-228	8.46E-001	5.43E-001	3.91E-001
RA-224	7.32E-001	1.65E-001	5.05E-002
PB-212	6.79E-001	7.56E-001	3.47E-002
BI-212	7.41E-001	3.28E-001	2.75E-001
TL-208	6.28E-001	1.42E-001	5.45E-002
U-235	Not Detected	---------	1.97E-001
TH-231	Not Detected	---------	1.04E+001
PA-231	Not Detected	---------	1.16E+000
TH-227	Not Detected	---------	3.12E-001
RA-223	Not Detected	---------	2.29E-001
RN-219	Not Detected	---------	3.05E-001
PB-211	Not Detected	---------	6.93E-001
TL-207	Not Detected	---------	1.08E+001
AM-241	Not Detected	---------	4.36E-001
PU-239	Not Detected	---------	3.59E+002
NP-237	Not Detected	---------	2.00E+000
PA-233	Not Detected	---------	4.58E-002
TH-229	Not Detected	---------	2.11E-001

[Summary Report] - Sample ID: : 00046505

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.08E-002
AG-110m	Not Detected	---	3.43E-002
BA-133	Not Detected	---	3.97E-002
BE-7	Not Detected	---	2.22E-001
CD-115	Not Detected	---	3.13E-001
CE-139	Not Detected	---	2.42E-002
CE-141	Not Detected	---	4.78E-002
CE-144	Not Detected	---	1.96E-001
CO-56	Not Detected	---	2.84E-002
CO-57	Not Detected	---	2.54E-002
CO-58	Not Detected	---	2.72E-002
CO-60	Not Detected	---	2.76E-002
CR-51	Not Detected	---	2.13E-001
CS-134	Not Detected	---	3.63E-002
CS-137	9.27E-002	4.22E-002	1.79E-002
EU-152	Not Detected	---	7.56E-002
EU-154	Not Detected	---	1.46E-001
EU-155	Not Detected	---	1.19E-001
FE-59	Not Detected	---	6.15E-002
GD-153	Not Detected	---	8.90E-002
HG-203	Not Detected	---	2.76E-002
I-131	Not Detected	---	3.54E-002
IR-192	Not Detected	---	2.25E-002
K-40	1.49E+001	2.02E+000	1.81E-001
MN-52	Not Detected	---	4.44E-002
MN-54	Not Detected	---	3.06E-002
MO-99	Not Detected	---	7.61E-001
NA-22	Not Detected	---	3.32E-002
NA-24	Not Detected	---	1.28E+001
NB-95	Not Detected	---	3.96E-001
ND-147	Not Detected	---	2.19E-001
NI-57	Not Detected	---	5.20E-001
RU-103	Not Detected	---	2.57E-002
RU-106	Not Detected	---	2.37E-001
SB-122	Not Detected	---	1.40E-001
SB-124	Not Detected	---	2.38E-002
SB-125	Not Detected	---	6.53E-002
SN-113	Not Detected	---	3.11E-002
SR-85	Not Detected	---	3.16E-002
TA-182	Not Detected	---	1.29E-001
TA-183	Not Detected	---	7.89E-001
TL-201	Not Detected	---	5.43E-001
XE-133	Not Detected	---	6.68E-001
Y-88	Not Detected	---	2.13E-002
ZN-65	Not Detected	---	8.55E-002
ZR-95	Not Detected	---	4.64E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/15/00 3:11:48 AM

Analyzed by: 3/15/00 Reviewed by: 3/15/00

Customer : E.MIGNARDOT (6134)
Customer Sample ID : 051441-002
Lab Sample ID : 00046506

Sample Description : SOIL IN MARINELLI BEAKER
Sample Quantity : 571.000 gram
Sample Date/Time : 3/09/00 10:02:00 AM
Acquire Start Date/Time : 3/15/00 1:31:35 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	8.05E-001
RA-226	1.55E+000	1.64E+000	5.11E-001
PB-214	6.34E-001	7.37E-001	4.98E-002
BI-214	6.29E-001	1.31E-001	4.58E-002
PB-210	Not Detected	---	3.56E+001
TH-232	8.12E-001	5.98E-001	1.53E-001
RA-228	7.26E-001	2.57E-001	1.50E-001
AC-228	7.20E-001	2.07E-001	7.43E-002
TH-228	7.31E-001	7.63E-001	3.98E-001
RA-224	8.10E-001	1.88E-001	6.84E-002
PB-212	Not Detected	---	3.69E-002
BI-212	9.00E-001	2.82E-001	2.95E-001
TL-208	7.09E-001	2.01E-001	6.41E-002
U-235	Not Detected	---	2.31E-001
TH-231	Not Detected	---	1.31E+001
PA-231	Not Detected	---	1.43E+000
TH-227	Not Detected	---	3.72E-001
RA-223	Not Detected	---	2.87E-001
RN-219	Not Detected	---	3.82E-001
PB-211	Not Detected	---	8.95E-001
TL-207	Not Detected	---	1.24E+001
AM-241	Not Detected	---	5.35E-001
PU-239	Not Detected	---	4.27E+002
NP-237	Not Detected	---	2.32E+000
PA-233	Not Detected	---	5.61E-002
TH-229	Not Detected	---	2.55E-001

[Summary Report] - Sample ID: : 00046506

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.81E-002
AG-110m	Not Detected	---	6.67E-002
BA-133	Not Detected	---	5.01E-002
BE-7	Not Detected	---	2.89E-001
CD-115	Not Detected	---	3.81E-001
CE-139	Not Detected	---	2.90E-002
CE-141	Not Detected	---	5.58E-002
CE-144	Not Detected	---	2.38E-001
CO-56	Not Detected	---	3.29E-002
CO-57	Not Detected	---	3.08E-002
CO-58	Not Detected	---	3.18E-002
CO-60	Not Detected	---	3.72E-002
CR-51	Not Detected	---	2.76E-001
CS-134	Not Detected	---	4.50E-002
CS-137	4.46E-001	8.25E-002	2.41E-002
EU-152	Not Detected	---	9.30E-002
EU-154	Not Detected	---	1.83E-001
EU-155	Not Detected	---	1.41E-001
FE-59	Not Detected	---	7.32E-002
GD-153	Not Detected	---	1.08E-001
HG-203	Not Detected	---	3.40E-002
I-131	Not Detected	---	4.35E-002
IR-192	Not Detected	---	2.93E-002
K-40	1.51E+001	2.08E+000	2.72E-001
MN-52	Not Detected	---	5.60E-002
MN-54	Not Detected	---	3.42E-002
MO-99	Not Detected	---	9.37E-001
NA-22	Not Detected	---	3.83E-002
NA-24	Not Detected	---	1.60E+001
NB-95	Not Detected	---	4.81E-001
ND-147	Not Detected	---	2.67E-001
NI-57	Not Detected	---	6.74E-001
RU-103	Not Detected	---	3.03E-002
RU-106	Not Detected	---	2.88E-001
SB-122	Not Detected	---	1.61E-001
SB-124	Not Detected	---	3.11E-002
SB-125	Not Detected	---	8.92E-002
SN-113	Not Detected	---	3.87E-002
SR-85	Not Detected	---	4.00E-002
TA-182	Not Detected	---	1.48E-001
TA-183	Not Detected	---	1.00E+000
TL-201	Not Detected	---	6.53E-001
XE-133	Not Detected	---	8.82E-001
Y-88	Not Detected	---	2.67E-002
ZN-65	Not Detected	---	1.00E-001
ZR-95	Not Detected	---	6.15E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/15/00 4:53:43 AM

Analyzed by: 3/15/00 Reviewed by: 3/15/00

Customer : E.MIGNARDOT (6134)
Customer Sample ID : 051442-002
Lab Sample ID : 00046507

Sample Description : SOIL IN MARINELLI BEAKER
Sample Quantity : 669.000 gram
Sample Date/Time : 3/09/00 10:10:00 AM
Acquire Start Date/Time : 3/15/00 3:13:31 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.59E-001
RA-226	Not Detected	---	4.33E-001
PB-214	4.66E-001	1.12E-001	4.02E-002
BI-214	4.17E-001	9.86E-002	3.89E-002
PB-210	Not Detected	---	3.14E+001
TH-232	6.18E-001	8.88E-001	1.24E-001
RA-228	5.20E-001	2.89E-001	1.23E-001
AC-228	5.95E-001	1.90E-001	6.12E-002
TH-228	Not Detected	---	4.22E-001
RA-224	6.15E-001	1.46E-001	5.25E-002
PB-212	6.38E-001	1.25E-001	3.27E-002
BI-212	7.97E-001	4.92E-001	2.75E-001
TL-208	5.94E-001	1.44E-001	5.45E-002
U-235	1.69E-001	1.56E-001	2.00E-001
TH-231	Not Detected	---	1.07E+001
PA-231	Not Detected	---	1.15E+000
TH-227	Not Detected	---	3.17E-001
RA-223	Not Detected	---	2.38E-001
RN-219	Not Detected	---	3.27E-001
PB-211	Not Detected	---	7.32E-001
TL-207	Not Detected	---	1.15E+001
AM-241	Not Detected	---	4.56E-001
PU-239	Not Detected	---	3.62E+002
NP-237	Not Detected	---	1.98E+000
PA-233	Not Detected	---	4.87E-002
TH-229	Not Detected	---	2.14E-001

[Summary Report] - Sample ID: : 00046507

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.46E-002
AG-110m	Not Detected	---------	5.70E-002
BA-133	Not Detected	---------	4.08E-002
BE-7	Not Detected	---------	2.31E-001
CD-115	Not Detected	---------	3.33E-001
CE-139	Not Detected	---------	2.40E-002
CE-141	Not Detected	---------	4.90E-002
CE-144	Not Detected	---------	1.97E-001
CO-56	Not Detected	---------	2.93E-002
CO-57	Not Detected	---------	2.67E-002
CO-58	Not Detected	---------	2.73E-002
CO-60	Not Detected	---------	3.13E-002
CR-51	Not Detected	---------	2.25E-001
CS-134	Not Detected	---------	3.48E-002
CS-137	3.76E-001	7.38E-002	1.89E-002
EU-152	Not Detected	---------	7.99E-002
EU-154	Not Detected	---------	1.64E-001
EU-155	Not Detected	---------	1.21E-001
FE-59	Not Detected	---------	6.11E-002
GD-153	Not Detected	---------	8.76E-002
HG-203	Not Detected	---------	2.86E-002
I-131	Not Detected	---------	3.83E-002
IR-192	Not Detected	---------	2.49E-002
K-40	1.37E+001	1.88E+000	2.12E-001
MN-52	Not Detected	---------	5.15E-002
MN-54	Not Detected	---------	2.89E-002
MO-99	Not Detected	---------	7.37E-001
NA-22	Not Detected	---------	3.38E-002
NA-24	Not Detected	---------	1.52E+001
NB-95	Not Detected	---------	4.18E-001
ND-147	Not Detected	---------	2.27E-001
NI-57	Not Detected	---------	6.05E-001
RU-103	Not Detected	---------	2.70E-002
RU-106	Not Detected	---------	2.38E-001
SB-122	Not Detected	---------	1.41E-001
SB-124	Not Detected	---------	2.56E-002
SB-125	Not Detected	---------	7.24E-002
SN-113	Not Detected	---------	3.29E-002
SR-85	Not Detected	---------	3.31E-002
TA-182	Not Detected	---------	1.21E-001
TA-183	Not Detected	---------	8.46E-001
TL-201	Not Detected	---------	5.66E-001
XE-133	Not Detected	---------	7.52E-001
Y-88	Not Detected	---------	2.22E-002
ZN-65	Not Detected	---------	8.04E-002
ZR-95	Not Detected	---------	4.56E-002

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/15/00 6:35:37 AM
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* Analyzed by: 3/15/00 Reviewed by: 3/15/00
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Customer : E.MIGNARDOT (6134)
Customer Sample ID : 051443-002
Lab Sample ID : 00046508

Sample Description : SOIL IN MARINELLI BEAKER
Sample Quantity : 505.000 gram
Sample Date/Time : 3/09/00 10:18:00 AM
Acquire Start Date/Time : 3/15/00 4:55:25 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	8.48E-001
RA-226	Not Detected	---------	6.10E-001
PB-214	6.70E-001	1.52E-001	5.35E-002
BI-214	6.10E-001	1.58E-001	5.24E-002
PB-210	Not Detected	---------	3.83E+001
TH-232	8.05E-001	4.42E-001	1.54E-001
RA-228	7.78E-001	3.73E-001	1.44E-001
AC-228	8.24E-001	2.43E-001	8.39E-002
TH-228	7.68E-001	8.42E-001	4.26E-001
RA-224	7.56E-001	1.83E-001	7.96E-002
PB-212	8.16E-001	1.49E-001	4.40E-002
BI-212	1.04E+000	5.56E-001	3.34E-001
TL-208	6.74E-001	1.79E-001	7.22E-002
U-235	Not Detected	---------	2.41E-001
TH-231	Not Detected	---------	1.34E+001
PA-231	Not Detected	---------	1.51E+000
TH-227	Not Detected	---------	4.08E-001
RA-223	Not Detected	---------	3.04E-001
RN-219	Not Detected	---------	4.11E-001
PB-211	Not Detected	---------	9.43E-001
TL-207	Not Detected	---------	1.33E+001
AM-241	Not Detected	---------	5.61E-001
PU-239	Not Detected	---------	4.52E+002
NP-237	Not Detected	---------	2.51E+000
PA-233	Not Detected	---------	6.43E-002
TH-229	Not Detected	---------	2.71E-001

[Summary Report] - Sample ID: : 00046508

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.00E-002
AG-110m	Not Detected	---------	7.71E-002
BA-133	Not Detected	---------	5.09E-002
BE-7	Not Detected	---------	3.18E-001
CD-115	Not Detected	---------	4.32E-001
CE-139	Not Detected	---------	3.06E-002
CE-141	Not Detected	---------	5.94E-002
CE-144	Not Detected	---------	2.41E-001
CO-56	Not Detected	---------	3.69E-002
CO-57	Not Detected	---------	3.28E-002
CO-58	Not Detected	---------	3.43E-002
CO-60	Not Detected	---------	3.89E-002
CR-51	Not Detected	---------	2.97E-001
CS-134	Not Detected	---------	4.83E-002
CS-137	5.45E-001	2.12E-001	2.37E-002
EU-152	Not Detected	---------	9.74E-002
EU-154	Not Detected	---------	1.91E-001
EU-155	Not Detected	---------	1.54E-001
FE-59	Not Detected	---------	7.98E-002
GD-153	Not Detected	---------	1.13E-001
HG-203	Not Detected	---------	3.62E-002
I-131	Not Detected	---------	4.94E-002
IR-192	Not Detected	---------	3.12E-002
K-40	1.50E+001	2.07E+000	2.77E-001
MN-52	Not Detected	---------	6.25E-002
MN-54	Not Detected	---------	3.63E-002
MO-99	Not Detected	---------	1.06E+000
NA-22	Not Detected	---------	4.53E-002
NA-24	Not Detected	---------	2.11E+001
NB-95	Not Detected	---------	5.42E-001
ND-147	Not Detected	---------	3.12E-001
NI-57	Not Detected	---------	7.73E-001
RU-103	Not Detected	---------	3.49E-002
RU-106	Not Detected	---------	2.83E-001
SB-122	Not Detected	---------	1.92E-001
SB-124	Not Detected	---------	3.44E-002
SB-125	Not Detected	---------	8.96E-002
SN-113	Not Detected	---------	4.00E-002
SR-85	Not Detected	---------	4.11E-002
TA-182	Not Detected	---------	1.58E-001
TA-183	Not Detected	---------	1.06E+000
TL-201	Not Detected	---------	7.31E-001
XE-133	Not Detected	---------	9.39E-001
Y-88	Not Detected	---------	3.21E-002
ZN-65	Not Detected	---------	1.07E-001
ZR-95	Not Detected	---------	5.83E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
3/15/00 8:17:32 AM

Analyzed by: 3/15/00 Reviewed by: 3/15/00

Customer : E.MIGNARDOT (6134)
Customer Sample ID : 051444-002
Lab Sample ID : 00046509

Sample Description : SOIL IN MARINELLI BEAKER
Sample Quantity : 749.000 gram
Sample Date/Time : 3/09/00 10:15:00 AM
Acquire Start Date/Time : 3/15/00 6:37:20 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.52E-001
RA-226	1.59E+000	6.92E-001	4.60E-001
PB-214	5.48E-001	1.14E-001	3.92E-002
BI-214	5.07E-001	1.18E-001	3.80E-002
PB-210	Not Detected	---	2.89E+001
TH-232	6.99E-001	3.84E-001	1.11E-001
RA-228	6.99E-001	2.69E-001	1.13E-001
AC-228	7.64E-001	1.94E-001	6.63E-002
TH-228	5.36E-001	4.81E-001	4.02E-001
RA-224	7.06E-001	1.60E-001	5.03E-002
PB-212	7.18E-001	1.27E-001	3.17E-002
BI-212	7.97E-001	5.08E-001	2.41E-001
TL-208	6.39E-001	1.43E-001	4.88E-002
U-235	Not Detected	---	1.84E-001
TH-231	Not Detected	---	1.05E+001
PA-231	Not Detected	---	1.15E+000
TH-227	Not Detected	---	3.11E-001
RA-223	Not Detected	---	2.34E-001
RN-219	Not Detected	---	3.00E-001
PB-211	Not Detected	---	6.81E-001
TL-207	Not Detected	---	1.07E+001
AM-241	Not Detected	---	4.24E-001
PU-239	Not Detected	---	3.49E+002
NP-237	Not Detected	---	1.93E+000
PA-233	Not Detected	---	4.55E-002
TH-229	Not Detected	---	2.13E-001

[Summary Report] - Sample ID: : 00046509

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.03E-002
AG-110m	Not Detected	---------	3.65E-002
BA-133	Not Detected	---------	3.87E-002
BE-7	Not Detected	---------	2.12E-001
CD-115	Not Detected	---------	3.35E-001
CE-139	Not Detected	---------	2.34E-002
CE-141	Not Detected	---------	4.53E-002
CE-144	Not Detected	---------	1.88E-001
CO-56	Not Detected	---------	2.83E-002
CO-57	Not Detected	---------	2.55E-002
CO-58	Not Detected	---------	2.70E-002
CO-60	Not Detected	---------	2.86E-002
CR-51	Not Detected	---------	2.11E-001
CS-134	Not Detected	---------	3.48E-002
CS-137	1.21E-001	3.94E-002	1.86E-002
EU-152	Not Detected	---------	7.51E-002
EU-154	Not Detected	---------	1.46E-001
EU-155	Not Detected	---------	1.18E-001
FE-59	Not Detected	---------	5.82E-002
GD-153	Not Detected	---------	8.81E-002
HG-203	Not Detected	---------	2.73E-002
I-131	Not Detected	---------	3.74E-002
IR-192	Not Detected	---------	2.29E-002
K-40	1.47E+001	2.00E+000	1.94E-001
MN-52	Not Detected	---------	5.22E-002
MN-54	Not Detected	---------	2.93E-002
MO-99	Not Detected	---------	8.06E-001
NA-22	Not Detected	---------	3.24E-002
NA-24	Not Detected	---------	1.86E+001
NB-95	Not Detected	---------	4.21E-001
ND-147	Not Detected	---------	2.33E-001
NI-57	Not Detected	---------	6.06E-001
RU-103	Not Detected	---------	2.57E-002
RU-106	Not Detected	---------	2.31E-001
SB-122	Not Detected	---------	1.34E-001
SB-124	Not Detected	---------	2.51E-002
SB-125	Not Detected	---------	6.33E-002
SN-113	Not Detected	---------	3.02E-002
SR-85	Not Detected	---------	3.08E-002
TA-182	Not Detected	---------	1.22E-001
TA-183	Not Detected	---------	7.97E-001
TL-201	Not Detected	---------	5.82E-001
XE-133	Not Detected	---------	7.59E-001
Y-88	Not Detected	---------	2.11E-002
ZN-65	Not Detected	---------	8.14E-002
ZR-95	Not Detected	---------	4.52E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 3/15/00 3:34:02 PM *
****
*
* Analyzed by: 3/15/00 Reviewed by: 3/15/00 *
****

Customer : E.MIGNARDOT (6134)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 00046510

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 3/15/00 3:23:48 PM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	4.36E+003
RA-226	Not Detected	---	5.88E+003
PB-214	Not Detected	---	6.33E+002
BI-214	Not Detected	---	5.56E+002
PB-210	Not Detected	---	2.55E+005
TH-232	Not Detected	---	1.93E+003
RA-228	Not Detected	---	2.29E+003
AC-228	Not Detected	---	1.31E+003
TH-228	Not Detected	---	1.87E+005
RA-224	Not Detected	---	7.33E+003
PB-212	Not Detected	---	1.43E+004
BI-212	Not Detected	---	1.04E+005
TL-208	Not Detected	---	2.51E+004
U-235	Not Detected	---	1.61E+003
TH-231	Not Detected	---	7.42E+004
PA-231	Not Detected	---	1.31E+004
TH-227	Not Detected	---	2.50E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	5.71E+003
PB-211	Not Detected	---	1.28E+004
TL-207	Not Detected	---	1.98E+005
AM-241	8.20E+004	1.36E+004	2.89E+003
PU-239	Not Detected	---	2.90E+006
NP-237	Not Detected	---	1.52E+004
PA-233	Not Detected	---	5.58E+002
TH-229	Not Detected	---	1.65E+003

[Summary Report] - Sample ID: : 00046510

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	2.72E+002
AG-110m	Not Detected	---------	2.21E+007
BA-133	Not Detected	---------	7.16E+002
BE-7	Not Detected	---------	6.72E+022
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	6.37E+009
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	6.59E+006
CO-56	Not Detected	---------	7.21E+015
CO-57	Not Detected	---------	1.29E+006
CO-58	Not Detected	---------	9.59E+016
CO-60	8.48E+004	1.11E+004	4.45E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	6.25E+003
CS-137	7.61E+004	9.88E+003	2.52E+002
EU-152	Not Detected	---------	1.02E+003
EU-154	Not Detected	---------	2.51E+003
EU-155	Not Detected	---------	3.58E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	1.28E+007
HG-203	Not Detected	---------	1.00E+026
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	2.41E+016
K-40	Not Detected	---------	1.38E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	6.14E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	2.33E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	1.66E+006
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	3.44E+019
SB-125	Not Detected	---------	1.07E+004
SN-113	Not Detected	---------	3.70E+011
SR-85	Not Detected	---------	2.64E+018
TA-182	Not Detected	---------	8.97E+011
TA-183	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	6.40E+011
ZN-65	Not Detected	---------	1.25E+007
ZR-95	Not Detected	---------	5.33E+018

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 3/15/00 3:34:04 PM
QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst : REESE
Sample ID : 00046510
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 3/15/00 3:23:48 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.189E-002	3.664E-003	8.201E-002	<	:	:	>
CS-137 Activity	7.121E-002	2.418E-003	7.614E-002	<	:In	:	>
CO-60 Activity	7.934E-002	2.706E-003	8.510E-002	<	:In	:	>

OK

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____ 3/15/00

Feature 58VV

Internal Lab

Batch No. 900184

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SAR/WR No.

AR/COC 601309

COPY

Dept. No./Mail Stop:	6134/1148	[redacted]	Contract No.: ~~AJ-2480A~~ QR
Project/Task Manager:	~~Site 8/58~~ Caroline Byrd	[redacted]	Case No.: 7213.220600
Project Name:	Foothill Test Area Site 8/58	Lab Contact: ~~Leslie Kent~~ Fernando	SMO Authorization:
Record Center Code:	ER/1333/58/DAT	Lab Destination: ~~SSCL~~ AMIR	Bill To: Sandia National Laboratories
Logbook Ref. No.:		SMO Contact/Phone: Doug Salmi/848-0963	Supplier Services Dept.:
Service Order No.	CPC655	Send Report to SMO	P.O. Box 5800 MS 0154
Location	Tech Area NA		
Building NA	Room NA	Reference LOV(available at SMO)	

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Lab Sample ID
044099-004	S58FB1-GR-001-0-SS	0	58	12599/1100	S	M	500m	NONE	G	SA	Gamma Spec	[redacted]
044100-004	S58FB1-GR-002-0-SS	0	58	12599/1105	S	M	500m	NONE	G	SA	Gamma Spec	
				2/3/99 vg								

RMMA ☒ Yes ☐ No Ref. No. [redacted]

Sample Disposal ☐ Return to Client ☒ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush

Required Report Date

Special Instructions/QC Requirements

EDD ☐ Yes ☒ No

Raw Data Package ☐ Yes ☒ No

This CoC releases 601308

Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Chris Catechis	Ch. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	William J Gibson	WJG	MDM/6131/235-3841

1.Relinquished by	William J Gibson	Org. 6131	Date 1-26-99	Time 16:25	4.Relinquished by	Gold R Kuna (SMO)	Org. 7578	Date 2/1/99	Time 0920
1. Received by	Gold R Kuna (SMO)	Org. 7578	Date 1/26/99	Time 1625	4. Received by	[illegible]	Org. 6133	Date 2/1/99	Time 0920
2.Relinquished by	[illegible] SMO	Org. 7577	Date 1-26-99	Time 1635	5.Relinquished by		Org.	Date	Time
2. Received by	[illegible]	Org. SMO 7577	Date 1-26-99	Time 1635	5. Received by		Org.	Date	Time
3.Relinquished by	[illegible]	Org. SMO 7578	Date 1/27/99	Time 1012	6.Relinquished by		Org.	Date	Time
3. Received by	Gold R Kuna (SMO)	Org. 7578	Date 1/27/99	Time 1012	6. Received by		Org.	Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Site 58
Phone: 845-0868
Date Results Needed: Rush
Suspect Isotopes: UNK
Other Information: N/A

Hazards/Special Instructions:

RUSH
Case #7213.2206
COC #601309

Batch Log Number: 900184
Logged By: JM

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044099-004	Soil	12599/1100	500ml	Gamma Spec	01	<300	754	
044100-004	Soil	12599/1105	500ml	Gamma Spec	02	<300	766	
LCS	—	1/26/99	—	Gamma Spec	03	N/A	N/A	

Relinquished by [signature] Gino Date 1-26-99 Time 1635 Received by [signature] Date 1/26/99 Time 1635
Relinquished by [signature] Date 1/27/99 Time 1012 Received by [signature] Date 1/27/99 Time 1012
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/26/99 8:42:33 PM

Analyzed by: 1/27/99 Reviewed by: 1/27/99

ustomer : C.BYRD/D.PERRY (6134/SMO)
ustomer Sample ID : 044099-004
ab Sample ID : 90018401

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 754.000 gram
ample Date/Time : 1/25/99 11:00:00 AM
cquire Start Date/Time : 1/26/99 7:02:20 PM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.21E-001
RA-226	1.35E+000	7.49E-001	5.61E-001
PB-214	5.66E-001	1.38E-001	6.31E-002
BI-214	5.21E-001	6.33E-001	4.99E-002
PB-210	Not Detected	---	8.22E+000
TH-232	6.44E-001	3.87E-001	1.47E-001
RA-228	8.54E-001	1.64E+000	1.47E-001
AC-228	6.73E-001	2.09E-001	8.26E-002
TH-228	8.89E-001	2.90E-001	4.63E-001
RA-224	1.04E+000	3.82E-001	9.52E-002
PB-212	7.58E-001	3.58E-001	4.17E-002
BI-212	6.23E-001	3.24E-001	3.36E-001
TL-208	7.04E-001	1.29E-001	6.35E-002
U-235	Not Detected	---	1.95E-001
TH-231	Not Detected	---	7.07E+000
PA-231	Not Detected	---	1.33E+000
TH-227	Not Detected	---	2.95E-001
RA-223	Not Detected	---	1.25E-001
RN-219	Not Detected	---	3.60E-001
PB-211	Not Detected	---	8.29E-001
TL-207	Not Detected	---	1.40E+001
AM-241	Not Detected	---	1.96E-001
PU-239	Not Detected	---	3.57E+002
NP-237	Not Detected	---	2.44E-001
PA-233	Not Detected	---	5.59E-002
TH-229	Not Detected	---	1.69E-001

[Summary Report] - Sample ID: : 90018401

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.01E-002
AG-110m	Not Detected	---------	5.59E-002
BA-133	Not Detected	---------	4.64E-002
BE-7	Not Detected	---------	2.48E-001
BI-207	Not Detected	---------	2.91E-002
CD-109	Not Detected	---------	8.13E-001
CD-115	Not Detected	---------	1.00E-001
CE-139	Not Detected	---------	2.36E-002
CE-141	Not Detected	---------	4.33E-002
CE-144	Not Detected	---------	1.90E-001
CO-56	Not Detected	---------	3.36E-002
CO-57	Not Detected	---------	2.42E-002
CO-58	Not Detected	---------	3.08E-002
CO-60	Not Detected	---------	3.55E-002
CR-51	Not Detected	---------	2.33E-001
CS-134	Not Detected	---------	3.32E-002
CS-137	2.73E-001	6.93E-002	2.48E-002
EU-152	Not Detected	---------	7.23E-002
EU-154	Not Detected	---------	1.89E-001
EU-155	Not Detected	---------	1.12E-001
FE-59	Not Detected	---------	7.79E-002
GD-153	Not Detected	---------	6.67E-002
HG-203	Not Detected	---------	2.94E-002
I-131	Not Detected	---------	3.03E-002
IR-192	Not Detected	---------	2.65E-002
K-40	1.52E+001	2.35E+000	6.35E-001
MN-52	Not Detected	---------	3.46E-002
MN-54	Not Detected	---------	3.73E-002
MO-99	Not Detected	---------	3.28E-001
NA-22	Not Detected	---------	4.73E-002
NA-24	Not Detected	---------	1.41E-001
NB-95	Not Detected	---------	1.36E-001
ND-147	Not Detected	---------	2.16E-001
NI-57	Not Detected	---------	1.02E-001
RU-103	Not Detected	---------	2.80E-002
RU-106	Not Detected	---------	2.84E-001
SB-122	Not Detected	---------	5.09E-002
SB-124	Not Detected	---------	2.86E-002
SB-125	Not Detected	---------	8.31E-002
SN-113	Not Detected	---------	3.40E-002
SR-85	Not Detected	---------	3.70E-002
TA-182	Not Detected	---------	1.62E-001
TA-183	Not Detected	---------	2.01E-001
TC-99m	Not Detected	---------	1.00E+000
TL-201	Not Detected	---------	1.22E-001
XE-133	Not Detected	---------	1.24E-001
Y-88	Not Detected	---------	2.83E-002
ZN-65	Not Detected	---------	1.08E-001
ZR-95	Not Detected	---------	5.61E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/27/99 8:49:32 AM

Analyzed by: 1/27/99 Reviewed by: 1/27/99

ustomer : C.BYRD/D.PERRY (6134/SMO)
ustomer Sample ID : 044100-004
ab Sample ID : 90018402

ample Description : MARINELLI SOLID SAMPLE
ample Quantity : 766.000 gram
ample Date/Time : 1/25/99 11:05:00 AM
cquire Start Date/Time : 1/26/99 8:44:21 PM
etector Name : LAB01
lapsed Live/Real Time : 6000 / 6002 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.01E-001
RA-226	1.06E+000	7.95E-001	6.16E-001
PB-214	5.86E-001	1.42E-001	6.52E-002
BI-214	5.01E-001	1.34E-001	5.25E-002
PB-210	Not Detected	---	7.89E+000
TH-232	8.25E-001	4.36E-001	1.44E-001
RA-228	6.93E-001	2.82E-001	1.67E-001
AC-228	6.81E-001	4.60E-001	8.78E-002
TH-228	8.84E-001	2.55E-001	4.38E-001
RA-224	8.92E-001	3.24E-001	8.52E-002
PB-212	7.24E-001	1.62E-001	4.10E-002
BI-212	8.01E-001	3.47E-001	3.42E-001
TL-208	6.77E-001	1.68E-001	6.95E-002
U-235	Not Detected	---	1.99E-001
TH-231	Not Detected	---	6.85E+000
PA-231	Not Detected	---	1.30E+000
TH-227	Not Detected	---	2.86E-001
RA-223	Not Detected	---	1.22E-001
RN-219	Not Detected	---	3.83E-001
PB-211	Not Detected	---	8.21E-001
TL-207	Not Detected	---	1.34E+001
AM-241	Not Detected	---	1.83E-001
PU-239	Not Detected	---	3.49E+002
NP-237	~~6.36E-001~~	~~3.42E-001~~	1.88E-001
PA-233	Not Detected	---	5.68E-002
TH-229	Not Detected	---	1.61E-001

Not detected
1/27/99

[Summary Report] - Sample ID: : 90018402

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.60E-002
AG-110m	Not Detected	---	7.09E-002
BA-133	Not Detected	---	4.72E-002
BE-7	Not Detected	---	2.72E-001
BI-207	Not Detected	---	3.09E-002
CD-109	Not Detected	---	8.12E-001
CD-115	Not Detected	---	1.01E-001
CE-139	Not Detected	---	2.36E-002
CE-141	Not Detected	---	4.51E-002
CE-144	Not Detected	---	1.91E-001
CO-56	Not Detected	---	3.47E-002
CO-57	Not Detected	---	2.37E-002
CO-58	Not Detected	---	3.16E-002
CO-60	Not Detected	---	3.72E-002
CR-51	Not Detected	---	2.37E-001
CS-134	Not Detected	---	3.41E-002
CS-137	5.46E-001	9.41E-002	2.02E-002
EU-152	Not Detected	---	7.13E-002
EU-154	Not Detected	---	1.74E-001
EU-155	Not Detected	---	1.12E-001
FE-59	Not Detected	---	7.52E-002
GD-153	Not Detected	---	6.49E-002
HG-203	Not Detected	---	2.96E-002
I-131	Not Detected	---	3.02E-002
IR-192	Not Detected	---	2.70E-002
K-40	1.52E+001	2.50E+000	6.20E-001
MN-52	Not Detected	---	3.67E-002
MN-54	Not Detected	---	3.71E-002
MO-99	Not Detected	---	3.24E-001
NA-22	Not Detected	---	4.52E-002
NA-24	Not Detected	---	1.64E-001
NB-95	Not Detected	---	1.37E-001
ND-147	Not Detected	---	2.19E-001
NI-57	Not Detected	---	9.86E-002
RU-103	Not Detected	---	2.75E-002
RU-106	Not Detected	---	2.93E-001
SB-122	Not Detected	---	5.68E-002
SB-124	Not Detected	---	2.86E-002
SB-125	Not Detected	---	7.97E-002
SN-113	Not Detected	---	3.74E-002
SR-85	Not Detected	---	3.59E-002
TA-182	Not Detected	---	1.55E-001
TA-183	Not Detected	---	1.89E-001
TC-99m	Not Detected	---	1.21E+000
TL-201	Not Detected	---	1.23E-001
XE-133	Not Detected	---	1.23E-001
Y-88	Not Detected	---	2.94E-002
ZN-65	Not Detected	---	1.09E-001
ZR-95	Not Detected	---	5.64E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/27/99 6:01:00 AM

Analyzed by: 1/27/99 Reviewed by: 1/27/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90018403

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/27/99 5:50:47 AM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.75E+003
RA-226	Not Detected	---	5.23E+003
PB-214	Not Detected	---	7.18E+002
BI-214	Not Detected	---	6.56E+002
PB-210	Not Detected	---	6.92E+004
TH-232	Not Detected	---	2.26E+003
RA-228	Not Detected	---	2.92E+003
AC-228	Not Detected	---	1.83E+003
TH-228	Not Detected	---	1.27E+005
RA-224	Not Detected	---	7.96E+003
PB-212	Not Detected	---	8.87E+003
BI-212	Not Detected	---	8.98E+004
TL-208	Not Detected	---	1.96E+004
U-235	Not Detected	---	1.39E+003
TH-231	Not Detected	---	4.50E+004
PA-231	Not Detected	---	1.36E+004
TH-227	Not Detected	---	2.26E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.10E+003
PB-211	Not Detected	---	1.35E+004
TL-207	Not Detected	---	2.54E+005
AM-241	8.17E+004	1.42E+004	1.36E+003
PU-239	Not Detected	---	2.38E+006
NP-237	Not Detected	---	1.35E+003
PA-233	Not Detected	---	6.39E+002
TH-229	Not Detected	---	1.11E+003

[Summary Report] - Sample ID: : 90018403

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.47E+002
AG-110m	Not Detected	---	7.73E+006
BA-133	Not Detected	---	7.75E+002
BE-7	Not Detected	---	3.58E+020
BI-207	Not Detected	---	3.52E+002
CD-109	Not Detected	---	4.16E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	7.08E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.10E+006
CO-56	Not Detected	---	2.36E+014
CO-57	Not Detected	---	3.74E+005
CO-58	Not Detected	---	2.43E+015
CO-60	7.84E+004	1.11E+004	5.21E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.92E+003
CS-137	6.96E+004	9.34E+003	3.04E+002
EU-152	Not Detected	---	8.00E+002
EU-154	Not Detected	---	2.95E+003
EU-155	Not Detected	---	2.60E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	2.51E+006
HG-203	Not Detected	---	7.48E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	5.57E+014
K-40	Not Detected	---	1.73E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	3.29E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.83E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	9.41E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	3.46E+017
SB-125	Not Detected	---	8.94E+003
SN-113	Not Detected	---	3.29E+010
SR-85	Not Detected	---	3.66E+016
TA-182	Not Detected	---	9.66E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	5.90E+010
ZN-65	Not Detected	---	5.06E+006
ZR-95	Not Detected	---	8.45E+016

****

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

Quality Assurance Report

****

Report Date : 1/27/99 6:01:03 AM
QA File : C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst : FCD
Sample ID : 90018403
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/27/99 5:50:47 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 ACTIVITY	8.550E-002	2.532E-003	8.173E-002	<			>
CS-137 Activity	6.836E-002	9.851E-004	6.959E-002	<			>
CO-60 Activity	7.600E-002	2.681E-003	7.839E-002	<			>

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 1/27/99

Feature 58G

58 HALO

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

Internal Lab Batch No. 610536

AR/COC- 05079

SF 2001-COC (6-95)

Dept. No./Mail Stop: 7584 MS1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1332/158/DAT
Logbook Ref No: C155
Service Order No.: CFO180

Date Samples Shipped: 4-27-96 USE
Carrier/Waybill No.: HC
Lab Contact: Eric Kent Fernando Dominguez
Lab Destination: GEL AMIR/844-7683
SMO Contact/Phone: Doug Cline/848-7913
Send Report to SMO Kathy Becker

Contract No.: NA
Case No.: 31 33-4 NO
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location

Tech Area III
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: Gamma Spec	Lab Sample ID
024035-02	58Halo-GR-101-6"-SS	6"	58	4/24/96 1354	S	P	500ml	None	GR	SA	X	
024036-02	58Halo-GR-102-6"-SS	6"	58	4/24/96 1359	S	P	500ml	None	GR	SA	X	

RMMA [X] Yes [ ] No Ref. No.
Sample Disposal [X] Return to Client [ ] Disposal by lab
Turnaround Time [X] Normal [ ] Rush Required Report Date

Sample Tracking SMO USE
Date Entered (mm/dd/yy)
Entered by:
QC Initials:

Special Instructions/QC Requirements
- Send as separate report to Mike Young.
- THIS IS AN RMMA
- THIS COC # 05079 WILL RELEASE COC # 05077 to GEL

Abnormal Conditions on Receipt LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Kurt A DeVaas			Lamb 7584 284-3301
	Concetta Caviato	Concetta Caviato	CC	Lamb 7584 284-3301
	Jim Calvert	Jim Calvert	JC	Lamb/ 7584/ 284-3301

1. Relinquished by	Concetta Caviato	Org. 7584	Date 4-29-96	Time 1320	4. Relinquished by	Org.	Date	Time
1. Received by		Org. SMO 7513	Date 4/29/96	Time 1326	4. Received by	Org.	Date	Time
2. Relinquished by		Org. SMO 7513	Date 4/29/96	Time 1347	5. Relinquished by	Org.	Date	Time
2. Received by		Org. SNL 7513	Date 4/24/96	Time 1347	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy

58 HALL

Internal Lab Batch No. 600536

SF 2001-COC (6-95)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

AR/COC- 05079

Dept. No./Mail Stop: 7584 MS 1148
Project/Task Manager: Mike Young
Project Name: Foothill Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No.: L155
Service Order No.: CF0180

Date Samples Shipped: 4-29-96
Carrier/Waybill No.: H/C
Lab Contact: ~~Edie Kent~~ Fernando Dominguez
Lab Destination: GEL AMIR/844-7683
SMO Contact/Phone: Doug Salmi/848-7913
Send Report to SMO: Kathy Becker

Contract No.: NA
Case No.: 7223-4M5
SMO Authorization: [signature]
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location Tech Area III
Building NA Room NA

Reference LOV (available at SMO)

Parameter & Method Requested: Gamma Spec

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
021035-02	58Hale-GR-001-6"-SS	6"	58	4/24/96 1354	S	P	500ml	None	GR	SA	X	
021031-02	58Hale-GR-002-6"-SS	6"	58	4/24/96 1359	S	P	500ml	None	GR	SA	X	
-												
-												
-												
-												
-												
-												
-												
-												

RMMA ☒ Yes ☐ No Ref. No. ____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date ____

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ____
Entered by: ____
QC inits. ____

Special Instructions/QC Requirements
Send as separate report to Mike Young.
• THIS IS AN RMMA
• THIS COC # 05079 WILL RELEASE COC # 05077 TO GEL

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members: Name	Signature	Init	Company/Organization/Phone
Kurt DeLanos	[signature]	[illegible]	Lamb 7584 284-3301
Cornetta Quinto	[signature]	CQ	Lamb 7584 284-3301
Jim Calvert	[signature]	JC	Lamb/7580/284-3301

	Name	Org.	Date	Time
1. Relinquished by	Cornetta Quinto	7584	4-29-96	1320
1. Received by	[signature]	SMO 7513	4/29/96	1320
2. Relinquished by	[signature]	SMO 7513	4/29/96	1347
2. Received by	[signature]	SMO 7513	4/29/96	1347
3. Relinquished by				
3. Received by				
4. Relinquished by				
4. Received by				
5. Relinquished by				
5. Received by				
6. Relinquished by				
6. Received by				

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

SMO ANALYTICAL DATA ROUTING FORM

Project Name: FOOTHILLS TEST AREA Case Number: 3622.400

SNL Task Leader: BYRD / YOUNG Org/Mail Stop: 7584/1148

SMO Project Coordinator: SALAS Sample Ship Date: 4/29/96

ARCOC	Lab	Lab ID
05079	7713	600536

Date Results Received:

Preliminary: _____ Final: 4/30/96

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____ Reviewer: _____

Date Review Complete: _____ Signature: _____

Date of Preliminary Notification: _____ Person Notified: _____

Date of Final Transmittal: 5/8/96 Transmitted To: YOUNG

Transmitted By: _____ Filed In Record Center: _____

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab Batch No. 600536

PAGE 1 OF 1

SF 2001-COC (6-95)

AR/COC- 05079

Dept. No./Mail Stop: 7584 MS1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No: GL55
Service Order No.: CF0180

Date Samples Shipped: 4-29-96
Carrier/Waybill No.: HC
Lab Contact: ~~Edna Kent~~ Fernando Dominguez
Lab Destination: ~~GEL~~ AMIR/BAA-7683
SMO Contact/Phone: Doug Schuh/848-0763
Send Report to SMO Kathy Becker

Contract No.: ~~AL24804~~ NA
Case No.: 3132-400
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested: Gamma Spec

Location Tech Area III
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
02403502	581lalo-GR-001-6"-SS	6"	58	4/24/96 1354	S	P	500ml	none	GR	SA	X	
02403602	581lalo-GR-002-6"-SS	6"	58	4/24/96 1359	S	P	500ml	NONE	GR	SA	X	

RMMA ☒ Yes ☐ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking
Date Entered (mm/dd/yy)
Entered by:
QC Inits.

Special Instructions/QC Requirements
- Send as separate report to Mike Young.
- THIS IS AN RMMA
- THIS COC # 05079 WILL RELEASE COC # 05077 to GEL

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Kurt DeVeas			Lamb 7584 284-3301
	Concetta Cassato	Concetta Cassato	CC	Lamb 7584 284-3301
	Jim Calvert	Jim Calvert	JC	Lamb/7584/2843301

1. Relinquished by	Concetta Cassato	Org. 7584	Date 4-29-96	Time 1320	4. Relinquished by		Org.	Date	Time
1. Received by		Org. SNL 7513	Date 4/29/96	Time 1320	4. Received by		Org.	Date	Time
2. Relinquished by		Org. SNL 7513	Date 4/29/96	Time 1347	5. Relinquished by		Org.	Date	Time
2. Received by		Org. SNL 713	Date 4/29/96	Time 1347	5. Received by		Org.	Date	Time
3. Relinquished by		Org. SNL 713	Date 4/30/96	Time 0930	6. Relinquished by		Org.	Date	Time
3. Received by		Org. SNL 7513	Date 4/30/96	Time 0930	6. Received by		Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, NM 87185-1093

date: April 30, 1996
to: D.L. McLaughlin, MS-0871 (7576)

from: K.A. Roberts, MS-1093 (7714)

subject: COC: 05079: Sample Number: 029035-02, 029036-02

The reference sample may be sent to General Engineering Laboratory without violating their Materials License with the State of South Carolina, License Number 13.

If you have any questions please contact me at 845-3227.

Sandia National Laboratories
Radiation Protection Sample Diagnostics 58HALO

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer : Mike Young
Organization: 7584
Project Location: Site 58 Main Bunker Foothills Test
Phone: 284-2595
Date Results Needed: 4-30-96
Suspect Isotopes: UNK
Other Information: Coc#05078

Hazards/Special Instructions:
- This is a RMMA
- I need 24-hr turn around
- This COC releases COC #05077.

Batch Log Number: 600536
Logged By: JMM

LIMS Login
Results Faxed
Sample Disposal

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

	Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
	029035-02	Soil	4/24/96 13:54	500ml Poly	Gamma Spec	01	<300	892g	
2	029036-02	Soil	4/24/96 1359	500ml Poly	Gamma Spec	02	<300	756g	
	LCS	—	ABOVE	—	Y spec	03	NA	NA	

Relinquished by [signature] Date 4/29/96 Time 1347 Received by [signature] Date 4/29/96 Time 1347
Relinquished by [signature] Date 4/30/96 Time 0930 Received by [signature] Date 4/30/96 Time 0930
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Kevin Roberts 05099 to CEL

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
4-29-96 3:17:29 PM

Analyzed by: 4/30/96 Reviewed by: 4/30/96

Customer : YOUNG/RANKIN (7584/SMO)
Customer Sample ID : 029035-02
Lab Sample ID : 60053601

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 892.000 gram
Sample Date/Time : 4-24-96 1:54:00 PM
Acquire Start Date : 4-29-96 1:33:24 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.87
TH-234	9.62E-01	3.04E-01	4.94E-01
RA-226	1.27	6.38E-01	9.62E-01
PB-214	5.78E-01	9.54E-02	6.08E-02
BI-214	5.59E-01	9.15E-02	5.06E-02
TH-232	7.20E-01	3.44E-01	1.90E-01
RA-228	8.90E-01	1.89E-01	1.22E-01
AC-228	8.53E-01	1.55E-01	9.21E-02
TH-228	7.10E-01	2.39E-01	4.17E-01
RA-224	8.46E-01	2.10E-01	7.29E-02
PB-212	8.41E-01	1.64E-01	3.38E-02
BI-212	9.53E-01	2.95E-01	3.77E-01
TL-208	7.09E-01	1.19E-01	8.36E-02
U-235	Not Detected	--------	2.07E-01
TH-231	Not Detected	--------	2.40
PA-231	Not Detected	--------	1.28
TH-227	Not Detected	--------	3.26E-01
RA-223	Not Detected	--------	2.14E-01
RN-219	Not Detected	--------	3.45E-01
PB-211	Not Detected	--------	8.05E-01
TL-207	Not Detected	--------	1.18E+01
AM-241	Not Detected	--------	4.82E-01
PU-239	Not Detected	--------	3.45E+02
NP-237	Not Detected	--------	2.44E-01
PA-233	Not Detected	--------	5.02E-02
TH-229	Not Detected	--------	2.52E-01

[Summary Report] - Sample ID: 60053601

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.57E-02
AG-110m	Not Detected	--------	3.78E-02
AR-41	Not Detected	--------	2.42E+18
BA-133	Not Detected	--------	5.16E-02
BA-140	Not Detected	--------	1.16E-01
CD-109	Not Detected	--------	8.43E-01
CD-115	Not Detected	--------	2.64E-01
CE-139	Not Detected	--------	2.63E-02
CE-141	Not Detected	--------	5.24E-02
CE-144	Not Detected	--------	2.11E-01
CO-56	Not Detected	--------	2.96E-02
CO-57	Not Detected	--------	2.80E-02
CO-58	Not Detected	--------	2.73E-02
CO-60	Not Detected	--------	3.17E-02
CR-51	Not Detected	--------	2.18E-01
CS-134	Not Detected	--------	4.21E-02
CS-137	1.45E-01	2.99E-02	3.05E-02
CU-64	Not Detected	--------	4.43E+03
EU-152	Not Detected	--------	7.37E-02
EU-154	Not Detected	--------	1.61E-01
EU-155	Not Detected	--------	1.22E-01
FE-59	Not Detected	--------	6.66E-02
GD-153	Not Detected	--------	1.01E-01
HG-203	Not Detected	--------	2.71E-02
I-131	Not Detected	--------	3.57E-02
IN-115m	Not Detected	--------	6.78E+06
IR-192	Not Detected	--------	2.43E-02
K-40	1.85E+01	2.50	2.78E-01
LA-140	Not Detected	--------	2.20E-01
MN-54	Not Detected	--------	3.05E-02
MN-56	Not Detected	--------	3.29E+12
MO-99	Not Detected	--------	7.70E-01
NA-22	Not Detected	--------	3.64E-02
NA-24	Not Detected	--------	7.75
NB-95	Not Detected	--------	3.97E-01
ND-147	Not Detected	--------	2.24E-01
NI-57	Not Detected	--------	4.31E-01
BE-07	Not Detected	--------	2.27E-01
RU-103	Not Detected	--------	2.60E-02
RU-106	Not Detected	--------	2.45E-01
SB-122	Not Detected	--------	1.27E-01
SB-124	Not Detected	--------	2.83E-02
SB-125	Not Detected	--------	7.26E-02
SC-46	Not Detected	--------	4.51E-02
SR-85	Not Detected	--------	3.31E-02
TA-182	Not Detected	--------	1.32E-01
TA-183	Not Detected	--------	8.21E-01
TE-132	Not Detected	--------	7.20E-02
TL-201	Not Detected	--------	4.46E-01
V-48	Not Detected	--------	3.85E-02
XE-133	Not Detected	--------	5.22E-01
Y-88	Not Detected	--------	2.18E-02
ZN-65	Not Detected	--------	8.68E-02
ZR-95	Not Detected	--------	5.16E-02

****
*
Sandia National Laboratories
*
*
Radiation Protection Sample Diagnostics Program [881 Laboratory]
*
*
4-29-96 5:53:05 PM
*
****
*
*
* Analyzed by: 4/30/96 Reviewed by: 4/30/96 *
****

Customer : YOUNG/RANKIN (7584/SMO)
Customer Sample ID : 029036-02
Lab Sample ID : 60053602

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 756.000 gram
Sample Date/Time : 4-24-96 1:59:00 PM
Acquire Start Date : 4-29-96 4:04:37 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.30
TH-234	1.00	3.53E-01	5.26E-01
RA-226	Not Detected	--------	7.09E-01
PB-214	7.22E-01	1.19E-01	7.56E-02
BI-214	6.52E-01	1.09E-01	6.75E-02
TH-232	9.91E-01	4.66E-01	2.31E-01
RA-228	9.18E-01	2.01E-01	1.33E-01
AC-228	9.14E-01	1.72E-01	1.15E-01
TH-228	7.83E-01	2.40E-01	4.25E-01
RA-224	9.14E-01	2.30E-01	9.05E-02
PB-212	8.70E-01	1.47E-01	3.80E-02
BI-212	1.14	3.18E-01	3.77E-01
TL-208	8.01E-01	1.38E-01	1.08E-01
U-235	8.63E-02	1.17E-01	1.89E-01
TH-231	Not Detected	--------	2.68
PA-231	Not Detected	--------	1.40
TH-227	Not Detected	--------	3.64E-01
RA-223	Not Detected	--------	2.42E-01
RN-219	Not Detected	--------	3.70E-01
PB-211	Not Detected	--------	8.60E-01
TL-207	Not Detected	--------	1.31E+01
AM-241	Not Detected	--------	5.15E-01
PU-239	Not Detected	--------	3.98E+02
NP-237	Not Detected	--------	2.67E-01
PA-233	Not Detected	--------	5.64E-02
TH-229	Not Detected	--------	2.78E-01

[Summary Report] - Sample ID: 60053602

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.98E-02
AG-110m	Not Detected	--------	3.76E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.12E-02
BA-140	Not Detected	--------	1.29E-01
CD-109	Not Detected	--------	9.24E-01
CD-115	Not Detected	--------	3.13E-01
CE-139	Not Detected	--------	3.03E-02
CE-141	Not Detected	--------	5.81E-02
CE-144	Not Detected	--------	2.36E-01
CO-56	Not Detected	--------	3.37E-02
CO-57	Not Detected	--------	3.15E-02
CO-58	Not Detected	--------	3.12E-02
CO-60	Not Detected	--------	3.57E-02
CR-51	Not Detected	--------	2.51E-01
CS-134	Not Detected	--------	4.87E-02
CS-137	8.81E-02	2.07E-02	2.14E-02
CU-64	Not Detected	--------	6.06E+03
EU-152	Not Detected	--------	8.43E-02
EU-154	Not Detected	--------	1.80E-01
EU-155	Not Detected	--------	1.35E-01
FE-59	Not Detected	--------	7.31E-02
GD-153	Not Detected	--------	1.11E-01
HG-203	Not Detected	--------	3.01E-02
I-131	Not Detected	--------	4.15E-02
IN-115m	Not Detected	--------	1.14E+07
IR-192	Not Detected	--------	2.77E-02
K-40	1.83E+01	2.48	3.27E-01
LA-140	Not Detected	--------	2.82E-01
MN-54	Not Detected	--------	3.38E-02
MN-56	Not Detected	--------	7.19E+12
MO-99	Not Detected	--------	8.40E-01
NA-22	Not Detected	--------	4.10E-02
NA-24	Not Detected	--------	9.57
NB-95	Not Detected	--------	4.50E-01
ND-147	Not Detected	--------	2.48E-01
NI-57	Not Detected	--------	5.27E-01
BE-07	Not Detected	--------	2.57E-01
RU-103	Not Detected	--------	2.83E-02
RU-106	Not Detected	--------	2.74E-01
SB-122	Not Detected	--------	1.43E-01
SB-124	Not Detected	--------	3.25E-02
SB-125	Not Detected	--------	8.16E-02
SC-46	Not Detected	--------	4.96E-02
SR-85	Not Detected	--------	3.75E-02
TA-182	Not Detected	--------	1.44E-01
TA-183	Not Detected	--------	8.94E-01
TE-132	Not Detected	--------	7.85E-02
TL-201	Not Detected	--------	5.04E-01
V-48	Not Detected	--------	4.00E-02
XE-133	Not Detected	--------	6.15E-01
Y-88	Not Detected	--------	2.45E-02
ZN-65	Not Detected	--------	9.51E-02
ZR-95	Not Detected	--------	5.88E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-30-96 5:49:33 AM *
****
*
* Analyzed by: 4/30/96 Reviewed by: 4/30/96 *
****

Customer : YOUNG/RANKIN (7584/SMO)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60053603

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 4-30-96 5:37:26 AM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:

****

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.28E+04
TH-234	Not Detected	--------	4.85E+03
RA-226	Not Detected	--------	6.32E+03
PB-214	Not Detected	--------	6.52E+02
BI-214	Not Detected	--------	6.03E+02
TH-232	Not Detected	--------	2.00E+03
RA-228	Not Detected	--------	2.80E+03
AC-228	Not Detected	--------	1.61E+03
TH-228	Not Detected	--------	4.85E+04
RA-224	Not Detected	--------	1.28E+03
PB-212	Not Detected	--------	3.59E+03
BI-212	Not Detected	--------	3.31E+04
TL-208	Not Detected	--------	6.69E+03
U-235	Not Detected	--------	1.81E+03
TH-231	Not Detected	--------	1.75E+04
PA-231	Not Detected	--------	1.36E+04
TH-227	Not Detected	--------	2.33E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.15E+03
PB-211	Not Detected	--------	1.18E+04
TL-207	Not Detected	--------	2.16E+05
AM-241	9.49E+04	1.61E+04	5.94E+03
PU-239	Not Detected	--------	3.40E+06
NP-237	Not Detected	--------	2.62E+03
PA-233	Not Detected	--------	5.78E+02
TH-229	Not Detected	--------	2.09E+03

[Summary Report] - Sample ID: 60053603

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-108m	Not Detected	--------	3.38E+02
AG-110m	Not Detected	--------	3.97E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.59E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.46E+05	1.24E+05	1.69E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	5.67E+06
CE-141	Not Detected	--------	1.57E+21
CE-144	Not Detected	--------	2.51E+05
CO-56	Not Detected	--------	2.61E+10
CO-57	Not Detected	--------	4.30E+04
CO-58	Not Detected	--------	1.16E+11
CO-60	7.40E+04	9.65E+03	5.44E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	1.84E+03
CS-137	6.67E+04	8.64E+03	5.94E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.17E+03
EU-154	Not Detected	--------	2.33E+03
EU-155	Not Detected	--------	2.30E+03
FE-59	Not Detected	--------	3.25E+16
GD-153	Not Detected	--------	2.58E+05
HG-203	Not Detected	--------	2.35E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	4.14E+10
K-40	Not Detected	--------	1.57E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.17E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	9.48E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	6.85E+14
RU-103	Not Detected	--------	7.86E+17
RU-106	Not Detected	--------	1.27E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	3.08E+12
SB-125	Not Detected	--------	4.23E+03
SC-46	Not Detected	--------	7.08E+09
SR-85	Not Detected	--------	7.07E+11
TA-182	Not Detected	--------	2.26E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	8.64E+07
ZN-65	Not Detected	--------	2.76E+05
ZR-95	Not Detected	--------	1.60E+12

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 4-30-96 5:52:26 AM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 60053603
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 4-30-96 5:37:26 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.299E-02	3.974E-03	9.487E-02	<			>
CS-137 Activity	6.852E-02	2.043E-03	6.673E-02	<			>
CO-60 Activity	7.505E-02	1.567E-03	7.339E-02	<	In		>

OK 4/30/96

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 4/30/96

COVER SHEET

FAX

Date: 4-29-96

To: ED RANKIN

Dept: SMD

FAX: 844-4976

FROM: JOHN KILBANE
Radiation Protection Operations, Department 7714-3

Sandia National Laboratories
PO Box 5800 MS: 1093
Albuquerque, NM 87185
Phone: 505-845-3271 Fax: 505-845-3375

Comments:

4 pages, including this cover sheet.

Survey Number: 3-96-0317

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept.	Date	Time	Duration
E.R # 58 HALO BUNKER	# 7585	4-25-96	10:30	N/A

Purpose	Request #	RWP #
RELEASE SAMPLES + EQUIPMENT	N/A	N/A

Instrument and Probe Type and Serial Number	Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1 / HP-260 / # 2828	JOHN P. KILBANE	John P Kilbane
BICRON MICRO REM # B278L		

#	Item Description	BETA/GAMMA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. 20 / Isotope D.U.				ALPHA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. N/A / Isotope N/A				RADIATION SURVEY Bkg. .01	
		cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	mrem/hr (3)	Distance
1	SAMPLE CONTAINER # 029045-03	80	80	ND	T					< .01	CONTACT
2	# 029046-04										
3	# 029037-01										
4	# 029039-01										
5	# 029041-01										
6	# 029036-01						N/A				
7	# 029040-01										
8	# 029038-01										
9	# 029042-01										
10	# 029035-01										
11	# 029044-04										
12	# 029043-03										

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, if other than gamma (i.e. n or β).

Remarks:

Reviewed by:

Survey Number: 3-96-0317

RADIOLOGICAL SURVEY FORM CONTINUATION

Location: #E.R.#58 HAID BUNKER

Purpose: SAMPLES + EQUIP.

Date: 4-25-96

#	Item Description	BETA-GAMMA CONTAMINATION (Counting Data Attached ☒Yes ☐No; % Eff. 20; Isotope D.U.) cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	ALPHA CONTAMINATION (Counting Data Attached ☒Yes ☐No; % Eff. N/A; Isotope N/A) cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R/F	RADIATION SURVEY (Bkg. .01) mrem/hr (3)	Distance
13	SAMPLE CONTAINER #029038-02	80	80	ND	T					<.02	CONTACT
14	#029041-02										
15	#029035-02										
16	#029040-02										
17	#029036-02										
18	#029037-02										
19	#029039-02										
20	(2) SMALL SHOVELS										
21	MIXING BOWL										
22	5 GALLON GREY BUCKET - INSIDE										
23	5 GALLON GREY BUCKET - OUTSIDE										
24	SAMPLING TOOL										
25	RAKE										
26	WHITE BUCKET - INSIDE										
27	WHITE BUCKET - OUTSIDE										
		N/A		N/A		N/A					N/A

Survey No. 3-96-0317

Radiation Protection Sample Diagnostics (7713) TA-III BLDG 6921
Smear Analysis

Date: 4/25/96

Counting Unit id: 1 (SNL# S874564)

Data file name: C:\LBXL\UNIT1\63009007.XLD

Batch Ended: 4/25/96 12:53

Crosstalk Correction: Applied

ANALYZED BY KILBANE

REVIEWED BY E.L.S

Alpha activity action level (DPM): 200.00

Beta activity action level (DPM): 1000.00

Certainty level for MDA and flags: 95.00%

High Voltage Setting: 1390

Application Revision: 3

Application Version: Standard

Alpha efficiency log file: pu238ab
Alpha Efficiency: 43.06%
Alpha to Beta Crosstalk: 10.98%
Alpha Background (CPM): 0.25
Alpha Correction Factor: 1.000

Beta efficiency log file: cl36ab
Beta Efficiency: 54.11%
Beta Into Alpha Crosstalk: 0.85%
Beta Background (CPM): 2.65
Beta Correction Factor: 1.000

Batch ID: E.R. #58 HALO BUNKER SAMPLES & EQUIPMENT 4-25-96 (KILBANE)

	Alpha Activity				Beta Activity				count	Alpha	Beta	Time
ID	DPM	σ	flags	MDA	DPM	σ	flags	MDA	Time	CPM	CPM	Complt
1	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	12:22
2	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	12:23
3	1.91	2.71	<MDA	11.32	4.21	4.23	<MDA	15.41	1.00	0.75	2.35	12:25
4	-0.68	2.69	<MDA	11.19	2.58	3.79	<MDA	15.18	1.00	-0.25	1.35	12:26
5	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	12:27
6	1.97	2.66	<MDA	10.84	-1.39	2.73	<MDA	15.41	1.00	0.75	-0.65	12:28
7	1.88	2.72	<MDA	11.47	6.08	4.62	<AL	15.41	1.00	0.75	3.35	12:29
8	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	12:30
9	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	12:32
10	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	12:33
11	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	12:34
12	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	12:35
13	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	12:36
14	1.97	2.66	<MDA	10.84	-1.39	2.73	<MDA	15.41	1.00	0.75	-0.65	12:37
15	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	12:39
16	-0.77	2.75	<MDA	11.78	10.04	5.33	<AL	15.17	1.00	-0.25	5.35	12:40
17	-0.77	2.75	<MDA	11.78	10.04	5.33	<AL	15.17	1.00	-0.25	5.35	12:41
18	-0.62	2.65	<MDA	10.69	-3.02	1.99	<MDA	15.19	1.00	-0.25	-1.65	12:42
19	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	12:43
20	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	12:44
21	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	12:46
22	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	12:47
23	1.84	2.75	<MDA	11.76	9.81	5.33	<AL	15.40	1.00	0.75	5.35	12:48
24	1.68	2.86	<MDA	12.68	22.87	7.28	<AL	15.39	1.00	0.75	12.35	12:49
25	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	12:50
26	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	12:51
27	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	12:53

Site 58 Halo Dunker

Internal Lab, Batch No. 600537

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

AR/COC- 05080

SF 2001-COC (6-95)

Dept. No./Mail Stop: 7584 MS1118
Project/Task Manager: Mike Young
Project Name: Exothills Test-Tiera
Record Center Code: ER1532/58/DAT
Logbook Ref No: 0155
Service Order No.: CF0180

Date Samples Shipped: 4-29-96 SMO USE
Carrier/Waybill No.: FC
Lab Contact: Fdo Fcat Fernando Dominguez
Lab Destination: CF ET AMIR
SMO Contact/Phone: Fernando Dominguez 844-7653
Send Report to SMO Kathy Becker

Contract No.: NA
Case No.: 3622-400
SMO Authorization: [signature]
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma & SVOC

Location
Tech Area II
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO) Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
02903 7 - 02	58Halo-GR-003-6"-SS	6"	58	4/24/96 1410	S	P	60ml	NONE	GR	SA	
02903 8 - 02	58Halo-GR-004-6"-SS	6"	58	4/24/96 1415	S	P	500	NONE	GR	SA	
02903 9 - 02	58Halo-GR-005-6"-SS	6"	58	4/24/96 1420	S	P	500	NONE	GR	SA	
02904 0 - 02	58Halo-GR-006-6"-SS	6"	58	4/24/96 1430	S	P	500	NONE	GR	SA	
02904 1 - 02	58Halo-GR-PIT-6"-SS	6"	58	4/24/96 1500	S	P	500	NONE	GR	SA	
02904 3 - 03	58Halo-GR-006-EB	-	58	4/24/96 1515	W	P	500	NONE	GR	EB	
02904 4 - 04	58Halo-GR-006-FB	-	58	4/24/96 1515	W	P	500	NONE	GR	FB	

RMMA ☒ Yes ☐ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date

Sample Tracking SMO USE
Date Entered (mm/dd/yy)
Entered by:
QC Inits

Special Instructions/QC Requirements
Send separate report to Mike Young
Internal Only

Abnormal Conditions on Receipt
LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Yasca DeLoss	[signature]	YD	Lamb 7584 284-3301
	Concetta Cacciato	[signature]	CC	Lamb/7584/284-3301
	Jim Calvert	[signature]	JC	Lamb/7584/2843301

1. Relinquished by	Concetta Cacciato	Org. 7584	Date 4-29-96	Time 13:20	4. Relinquished by		Org.	Date	Time
1. Received by		Org. SMO 7513	Date 4/30/96	Time 1320	4. Received by		Org.	Date	Time
2. Relinquished by		Org. SMO 7513	Date 4/29/96	Time 1349	5. Relinquished by		Org.	Date	Time
2. Received by		Org. SNL 7713	Date 4/29/96	Time 1349	5. Received by		Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy

Site 58 HALO BUNKER

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

Internal Lab Batch No. 600537

AR/COC- 05080

SF 2001-COC (6-95)

Dept. No./Mail Stop: 7584 MS 0719
Project/Task Manager: Mike Young
Project Name: Eastern Test Area
Record Center Code: ER 1132/58/SAT
Logbook Ref No: LASS
Service Order No.: CR 6100

Date Samples Shipped: 4-29-96
Carrier/Waybill No.: FC
Lab Contact: Eric Ernest Fernandez Brown
Lab Destination: AMIR
SMO Contact/Phone: Fernando Dominguez 294-7753 Kathy Becker

Contract No.: NA
Case No.: 31-32-4600
SMO Authorization: [illegible]
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec

Location

Tech Area II
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO) Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
029037 - 02	58Halo-GR-103-6"-SS	6"	58	11/24/96 1410	S	P	500ml	NONE	GR	SA	
029038 - 02	58Halo-GR-104-6"-SS	6"	58	4/24/96 1415	S	P	500	NONE	GR	SA	
029039 - 02	58Halo-GR-105-6"-SS	6"	58	4/24/96 1420	S	P	500	NONE	GR	SA	
029040 - 02	58Halo-GR-106-6"-SS	6"	58	4/24/96 1430	S	P	500	NONE	GR	SA	
029041 - 02	58Halo-GR-Pit-6"-SS	6"	58	4/24/96 1500	S	P	500	NONE	GR	SA	
029043 - 03	58Halo-GR-006-EB	-	58	4/24/96 1515	W	P	500	NONE	GR	EB	
029044 - 04	58Halo-GR-006-FB	-	58	4/24/96 1515	W	P	500	NONE	GR	FB	

LAB USE

RMMA ☒ Yes ☐ No Ref. No. ____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date ____

Sample Tracking SMO USE
Date Entered (mm/dd/yy) ____
Entered by: ____
QC inits. ____

Special Instructions/QC Requirements
Need separate report to Mike Young. Informal Only

Abnormal Conditions on Receipt LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Kasia Dziuk	[signature]		Lamb/7584/294-3301
	Concetta Cavuoto	[signature]	CC	Lamb/7584/294-3301
	Jim Calvert	[signature]	JC	Lamb/7584/294-3301

1. Relinquished by	Concetta Cavuoto	Org. 7584	Date 4-29-96	Time 13:20	4. Relinquished by	Org.	Date	Time
1. Received by	[signature]	Org. SMO 7513	Date 4/29/96	Time 1320	4. Received by	Org.	Date	Time
2. Relinquished by	[signature]	Org. SMO 7513	Date 4/29/96	Time 1349	5. Relinquished by	Org.	Date	Time
2. Received by	[signature]	Org. SMO 7713	Date 4/29/96	Time 1349	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

ER/1332 58/DAT

SMO ANALYTICAL DATA ROUTING FORM

Project Name: FOOTHILLS TESTAREA Case Number: 3622.400

SNL Task Leader: BYRD/YOUNG Org/Mail Stop: 7584/1148

SMO Project Coordinator: SALAZAR Sample Ship Date: 4/29/96

ARCOC	Lab	Lab ID
05080	2713	600537

Date Results Received:

Preliminary: _____ Final: 5/3/96

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____ Reviewer: _____

Date Review Complete: _____ Signature: _____

Date of Preliminary Notification: _____ Person Notified: _____

Date of Final Transmittal: 5/22/96 Transmitted To: YOUNG

Transmitted By: _____ Filed In Record Center: _____

Comments: _____

Site 58 HALO BUNKER

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

AR/COC- 05080

Internal Lab Batch No. 600537

SF 2001-COC (6-95)

Dept. No./Mail Stop: 7584 MS 1118
Project/Task Manager: Mike Young
Project Name: Kathill East Area
Record Center Code: CF 11332/58/DAT
Logbook Ref No: 0155
Service Order No.: CF 1150

Date Samples Shipped: 4-29-96
Carrier/Waybill No.: NC
Lab Contact: Ester Hunt Fernando Dominguez
Lab Destination: AMIR
SMO Contact/Phone: Fernando Dominguez 845-7853
Send Report to SMO: Kathy Becker

Contract No.: NA
Case No.: 3632-1(c)
SMO Authorization: DWS
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Parameter & Method Requested: Gamma Spec

Location Tech Area III
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
02903 7-02	58Halo-GR-003-6"-SS	6"	58	4/24/96 1410	S	P	500ml	NONE	GR	SA	X	
02903 8-02	58Halo-GR-004-6"-SS	6"	58	4/24/96 1415	S	P	500	NONE	GR	SA	X	
02903 9-02	58Halo-GR-005-6"-SS	6"	58	4/24/96 1428	S	P	500	NONE	GR	SA	X	
02904 0-02	58Halo-GR-006-6"-SS	6"	58	4/24/96 1430	S	P	500	NONE	GR	SA	X	
02904 1-02	58HALO-GR-FB-6"-SS	6"	58	4/24/96 1500	S	P	500	NONE	GR	SA	X	
02904 3-03	58Halo-GR-006-EB	—	58	4/24/96 1515	W	P	500	NONE	GR	EB	X	
02904 4-04	58Halo-GR-006-FB	—	58	4/24/96 1515	W	P	500	NONE	GR	FB	X	

RMMA ☒ Yes ☐ No Ref. No. ____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date ____

Sample Tracking
Date Entered (mm/dd/yy): 5/15/96
Entered by: ____
QC inits.: AMC

Special Instructions/QC Requirements
Send separate report to Mike Young.
Internal Only

Abnormal Conditions on Receipt

Sample Team Members

Name	Signature	Init	Company/Organization/Phone
Karen DeWees			Lamb/7584/284-3301
Concetta Caviglio	Concetta Caviglio	CC	Lamb/7584/284-3301
Jim Calvert	Jim Calvert	JC	Lamb/7584/2843301

1. Relinquished by	Concetta Caviglio	Org. 7584	Date 4.29.96	Time 13:20	4. Relinquished by		Org.	Date	Time
1. Received by		Org. 7513	Date 4/29/96	Time 1320	4. Received by		Org.	Date	Time
2. Relinquished by		Org. 7513	Date 4/29/96	Time 1347	5. Relinquished by		Org.	Date	Time
2. Received by		Org. SNL 771 J	Date 4/30/96	Time 1349	5. Received by		Org.	Date	Time
3. Relinquished by		Org. SNL 771 J	Date 5/1/96	Time 0900	6. Relinquished by		Org.	Date	Time
3. Received by		Org. 7512	Date 5/2/96	Time 0700	6. Received by		Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics 58 HALO BUNKER

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer : MIKE YOUNG
Organization: 7584
Project Location: ER SITE 58 Foothills
Phone: 284-2595
Date Results Needed: ~~5/1/96~~ 5/2/96
Suspect Isotopes:
Other Information: Coc# 05080

Hazards/Special Instructions:
SEND REPORT TO MIKE YOUNG.

Batch Log Number: 601537
Logged By: JCM

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
029037-02	Soil	4-24-96 1410	500ml	Gamma Spec.	01	<300	881g	
029038-02		1415			02		883g	
029039-02		1428			03		833g	
029040-02		1430			04		814g	
029041-02		1500			05		841g	
029043-03	DIW	1515			06		NA	
029044-04	DIW	1515			07	<300	NA	
LCS	—	1200	—	γ Spec	08	NA	NA	

Relinquished by [signature] Date 4/29/96 Time 1349 Received by [signature] Date 4/29/96 Time 1349
Relinquished by [signature] Date 5/3/96 Time 0900 Received by [signature] Date 5/3/96 Time 0900
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

****

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

4-30-96 5:28:09 PM

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Analyzed by: 5/1/96 Reviewed by: 5/1/96

****

Customer : M.YOUNG/E.RANKIN (7584/SMO)
Customer Sample ID : 029037-02
Lab Sample ID : 60053701

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 881.000 gram
Sample Date/Time : 4-24-96 2:10:00 PM
Acquire Start Date : 4-30-96 3:44:26 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.16
TH-234	1.45	3.94E-01	5.22E-01
RA-226	1.48	5.05E-01	6.98E-01
PB-214	7.52E-01	1.22E-01	7.60E-02
BI-214	7.35E-01	1.16E-01	5.43E-02
TH-232	9.36E-01	4.32E-01	1.75E-01
RA-228	9.99E-01	2.45E-01	1.33E-01
AC-228	1.05	1.98E-01	6.93E-02
TH-228	9.24E-01	2.52E-01	4.25E-01
RA-224	8.71E-01	2.18E-01	9.17E-02
PB-212	9.63E-01	1.59E-01	3.65E-02
BI-212	1.04	2.94E-01	3.55E-01
TL-208	8.00E-01	1.37E-01	1.09E-01
U-235	~~1.33E-01~~	~~1.79E-01~~	2.29E-01 not detected
TH-231	Not Detected	--------	2.61
PA-231	Not Detected	--------	1.36
TH-227	Not Detected	--------	3.52E-01
RA-223	Not Detected	--------	2.45E-01
RN-219	Not Detected	--------	3.55E-01
PB-211	Not Detected	--------	8.32E-01
TL-207	Not Detected	--------	1.28E+01
AM-241	Not Detected	--------	5.07E-01
PU-239	Not Detected	--------	3.23E+02
NP-237	Not Detected	--------	2.61E-01
PA-233	Not Detected	--------	5.45E-02
TH-229	Not Detected	--------	2.72E-01

[Summary Report] - Sample ID: 60053701

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.88E-02
AG-110m	Not Detected	--------	3.67E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.82E-02
BA-140	Not Detected	--------	1.34E-01
CD-109	Not Detected	--------	9.06E-01
CD-115	Not Detected	--------	4.10E-01
CE-139	Not Detected	--------	2.86E-02
CE-141	Not Detected	--------	5.81E-02
CE-144	Not Detected	--------	2.28E-01
CO-56	Not Detected	--------	3.17E-02
CO-57	Not Detected	--------	3.08E-02
CO-58	Not Detected	--------	2.91E-02
CO-60	Not Detected	--------	3.47E-02
CR-51	Not Detected	--------	2.49E-01
CS-134	Not Detected	--------	4.64E-02
CS-137	1.18E-01	2.72E-02	2.13E-02
CU-64	Not Detected	--------	2.00E+04
EU-152	Not Detected	--------	8.04E-02
EU-154	Not Detected	--------	1.75E-01
EU-155	Not Detected	--------	1.31E-01
FE-59	Not Detected	--------	7.17E-02
GD-153	Not Detected	--------	1.09E-01
HG-203	Not Detected	--------	2.98E-02
I-131	Not Detected	--------	4.16E-02
IN-115m	Not Detected	--------	4.13E+08
IR-192	Not Detected	--------	2.75E-02
K-40	2.07E+01	2.79	3.09E-01
LA-140	Not Detected	--------	3.92E-01
MN-54	Not Detected	--------	3.15E-02
MN-56	Not Detected	--------	3.69E+15
MO-99	Not Detected	--------	1.05
NA-22	Not Detected	--------	3.78E-02
NA-24	Not Detected	--------	2.81E+01
NB-95	Not Detected	--------	5.25E-01
ND-147	Not Detected	--------	2.65E-01
NI-57	Not Detected	--------	7.51E-01
BE-07	Not Detected	--------	2.46E-01
RU-103	Not Detected	--------	2.72E-02
RU-106	Not Detected	--------	2.52E-01
SB-122	Not Detected	--------	1.79E-01
SB-124	Not Detected	--------	2.88E-02
SB-125	Not Detected	--------	7.90E-02
SC-46	Not Detected	--------	5.10E-02
SR-85	Not Detected	--------	3.49E-02
TA-182	Not Detected	--------	1.49E-01
TA-183	Not Detected	--------	1.00
TE-132	Not Detected	--------	9.64E-02
TL-201	Not Detected	--------	6.06E-01
V-48	Not Detected	--------	4.16E-02
XE-133	Not Detected	--------	8.07E-01
Y-88	Not Detected	--------	2.41E-02
ZN-65	Not Detected	--------	9.73E-02
ZR-95	Not Detected	--------	5.74E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-01-96 10:09:48 AM *
****
*
* Analyzed by: 5/1/96 Reviewed by: 5/1/96 *
****

Customer : M.YOUNG/E.RANKIN (7584/SMO)
Customer Sample ID : 029038-02
Lab Sample ID : 60053702

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 883.000 gram
Sample Date/Time : 4-24-96 2:15:00 PM
Acquire Start Date : 5-01-96 8:26:17 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.96
TH-234	Not Detected	--------	6.96E-01
RA-226	1.23	4.41E-01	6.15E-01
PB-214	6.66E-01	1.10E-01	7.23E-02
BI-214	6.25E-01	1.09E-01	8.47E-02
TH-232	8.74E-01	4.14E-01	2.22E-01
RA-228	8.94E-01	2.31E-01	1.30E-01
AC-228	7.52E-01	1.40E-01	8.92E-02
TH-228	8.12E-01	2.30E-01	3.96E-01
RA-224	8.57E-01	2.12E-01	6.82E-02
PB-212	8.08E-01	1.34E-01	3.40E-02
BI-212	7.97E-01	2.56E-01	3.27E-01
TL-208	7.27E-01	1.21E-01	8.54E-02
U-235	Not Detected	--------	2.09E-01
TH-231	Not Detected	--------	2.41
PA-231	Not Detected	--------	1.29
TH-227	Not Detected	--------	3.23E-01
RA-223	Not Detected	--------	2.40E-01
RN-219	Not Detected	--------	3.40E-01
PB-211	Not Detected	--------	8.07E-01
TL-207	Not Detected	--------	1.18E+01
AM-241	Not Detected	--------	4.76E-01
PU-239	Not Detected	--------	4.00E+02
NP-237	Not Detected	--------	3.42E-01
PA-233	Not Detected	--------	5.13E-02
TH-229	Not Detected	--------	2.54E-01

[Summary Report] - Sample ID: 60053702

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.51E-02
AG-110m	Not Detected	--------	3.18E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.35E-02
BA-140	Not Detected	--------	1.32E-01
CD-109	Not Detected	--------	7.21E-01
CD-115	Not Detected	--------	4.76E-01
CE-139	Not Detected	--------	2.69E-02
CE-141	Not Detected	--------	5.43E-02
CE-144	Not Detected	--------	2.17E-01
CO-56	Not Detected	--------	3.15E-02
CO-57	Not Detected	--------	2.90E-02
CO-58	Not Detected	--------	2.88E-02
CO-60	Not Detected	--------	3.24E-02
CR-51	Not Detected	--------	2.38E-01
CS-134	Not Detected	--------	4.35E-02
CS-137	5.15E-02	1.98E-02	2.76E-02
CU-64	Not Detected	--------	4.78E+04
EU-152	Not Detected	--------	7.45E-02
EU-154	Not Detected	--------	1.60E-01
EU-155	Not Detected	--------	1.24E-01
FE-59	Not Detected	--------	7.11E-02
GD-153	Not Detected	--------	1.03E-01
HG-203	Not Detected	--------	2.82E-02
I-131	Not Detected	--------	4.20E-02
IN-115m	Not Detected	--------	5.05E+09
IR-192	Not Detected	--------	2.53E-02
K-40	1.98E+01	2.67	2.69E-01
LA-140	Not Detected	--------	5.10E-01
MN-54	Not Detected	--------	3.03E-02
MN-56	Not Detected	--------	3.17E+17
MO-99	Not Detected	--------	1.21
NA-22	Not Detected	--------	3.72E-02
NA-24	Not Detected	--------	5.50E+01
NB-95	Not Detected	--------	5.50E-01
ND-147	Not Detected	--------	2.55E-01
NI-57	Not Detected	--------	9.77E-01
BE-07	Not Detected	--------	2.32E-01
RU-103	Not Detected	--------	2.66E-02
RU-106	Not Detected	--------	2.48E-01
SB-122	Not Detected	--------	1.95E-01
SB-124	Not Detected	--------	2.89E-02
SB-125	Not Detected	--------	7.41E-02
SC-46	Not Detected	--------	4.91E-02
SR-85	Not Detected	--------	3.32E-02
TA-182	Not Detected	--------	1.43E-01
TA-183	Not Detected	--------	1.04
TE-132	Not Detected	--------	1.02E-01
TL-201	Not Detected	--------	6.43E-01
V-48	Not Detected	--------	3.96E-02
XE-133	Not Detected	--------	9.40E-01
Y-88	Not Detected	--------	1.92E-02
ZN-65	Not Detected	--------	9.43E-02
ZR-95	Not Detected	--------	5.42E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
5-01-96 2:53:52 PM

Analyzed by: 5/3/96 Reviewed by: 5-/3/96

Customer : M.YOUNG/E.RANKIN (7584/SMO)
Customer Sample ID : 029039-02
Lab Sample ID : 60053703

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 833.000 gram
Sample Date/Time : 4-24-96 2:28:00 PM
Acquire Start Date : 5-01-96 11:39:44 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.95
TH-234	1.16	3.14E-01	5.01E-01
RA-226	1.47	2.13E-01	5.02E-01
PB-214	6.12E-01	1.01E-01	6.54E-02
BI-214	5.63E-01	9.43E-02	5.84E-02
TH-232	7.92E-01	3.77E-01	2.05E-01
RA-228	7.67E-01	1.75E-01	1.27E-01
AC-228	8.24E-01	1.53E-01	9.51E-02
TH-228	6.48E-01	2.33E-01	3.91E-01
RA-224	8.51E-01	2.12E-01	7.37E-02
PB-212	7.77E-01	1.34E-01	3.63E-02
BI-212	8.54E-01	2.67E-01	3.36E-01
TL-208	6.82E-01	1.20E-01	9.55E-02
U-235	Not Detected	--------	2.10E-01
TH-231	Not Detected	--------	2.37
PA-231	Not Detected	--------	1.29
TH-227	Not Detected	--------	3.25E-01
RA-223	Not Detected	--------	2.38E-01
RN-219	Not Detected	--------	3.50E-01
PB-211	Not Detected	--------	8.14E-01
TL-207	Not Detected	--------	1.25E+01
AM-241	Not Detected	--------	4.60E-01
PU-239	Not Detected	--------	3.94E+02
NP-237	Not Detected	--------	2.60E-01
PA-233	Not Detected	--------	5.20E-02
TH-229	Not Detected	--------	2.43E-01

[Summary Report] - Sample ID: 60053703

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.62E-02
AG-110m	Not Detected	--------	3.25E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.41E-02
BA-140	Not Detected	--------	1.32E-01
CD-109	Not Detected	--------	9.02E-01
CD-115	Not Detected	--------	4.87E-01
CE-139	Not Detected	--------	2.71E-02
CE-141	Not Detected	--------	5.46E-02
CE-144	Not Detected	--------	2.15E-01
CO-56	Not Detected	--------	3.11E-02
CO-57	Not Detected	--------	2.89E-02
CO-58	Not Detected	--------	2.93E-02
CO-60	Not Detected	--------	3.11E-02
CR-51	Not Detected	--------	2.31E-01
CS-134	Not Detected	--------	4.45E-02
CS-137	5.63E-02	1.81E-02	2.33E-02
CU-64	Not Detected	--------	5.57E+04
EU-152	Not Detected	--------	7.65E-02
EU-154	Not Detected	--------	1.64E-01
EU-155	Not Detected	--------	1.24E-01
FE-59	Not Detected	--------	7.04E-02
GD-153	Not Detected	--------	9.96E-02
HG-203	Not Detected	--------	2.80E-02
I-131	Not Detected	--------	4.34E-02
IN-115m	Not Detected	--------	7.90E+09
IR-192	Not Detected	--------	2.53E-02
K-40	1.77E+01	2.40	2.81E-01
LA-140	Not Detected	--------	5.53E-01
MN-54	Not Detected	--------	1.66E-02
MN-56	Not Detected	--------	7.01E+17
MO-99	Not Detected	--------	1.27
NA-22	Not Detected	--------	3.73E-02
NA-24	Not Detected	--------	6.54E+01
NB-95	Not Detected	--------	5.67E-01
ND-147	Not Detected	--------	2.59E-01
NI-57	Not Detected	--------	1.06
BE-07	Not Detected	--------	2.29E-01
RU-103	Not Detected	--------	2.70E-02
RU-106	Not Detected	--------	2.48E-01
SB-122	Not Detected	--------	2.06E-01
SB-124	Not Detected	--------	2.86E-02
SB-125	Not Detected	--------	7.39E-02
SC-46	Not Detected	--------	4.82E-02
SR-85	Not Detected	--------	3.41E-02
TA-182	Not Detected	--------	1.40E-01
TA-183	Not Detected	--------	1.02
TE-132	Not Detected	--------	1.07E-01
TL-201	Not Detected	--------	6.82E-01
V-48	Not Detected	--------	4.12E-02
XE-133	Not Detected	--------	9.64E-01
Y-88	Not Detected	--------	2.53E-02
ZN-65	Not Detected	--------	9.09E-02
ZR-95	Not Detected	--------	5.56E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-01-96 3:26:30 PM *
****
*
* Analyzed by: 5/3/96 Reviewed by: 5/3/96 *
****

Customer : M.YOUNG/E.RANKIN (7584/SMO)
Customer Sample ID : 029040-02
Lab Sample ID : 60053704

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 814.000 gram
Sample Date/Time : 4-24-96 2:30:00 PM
Acquire Start Date : 5-01-96 1:42:52 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.86
TH-234	8.03E-01	2.87E-01	4.44E-01
RA-226	1.39	5.31E-01	7.57E-01
PB-214	4.72E-01	7.04E-02	3.96E-02
BI-214	4.11E-01	7.27E-02	5.02E-02
TH-232	6.88E-01	3.23E-01	1.51E-01
RA-228	7.48E-01	1.69E-01	1.09E-01
AC-228	5.98E-01	1.23E-01	9.79E-02
TH-228	5.14E-01	1.91E-01	4.21E-01
RA-224	6.81E-01	1.75E-01	7.18E-02
PB-212	6.60E-01	1.13E-01	3.35E-02
BI-212	5.90E-01	2.82E-01	4.10E-01
TL-208	5.71E-01	9.83E-02	6.82E-02
U-235	Not Detected	--------	2.01E-01
TH-231	Not Detected	--------	2.36
PA-231	Not Detected	--------	1.27
TH-227	Not Detected	--------	3.10E-01
RA-223	Not Detected	--------	2.30E-01
RN-219	Not Detected	--------	3.22E-01
PB-211	Not Detected	--------	7.61E-01
TL-207	Not Detected	--------	1.27E+01
AM-241	Not Detected	--------	4.72E-01
PU-239	Not Detected	--------	3.54E+02
NP-237	Not Detected	--------	2.05E-01
PA-233	Not Detected	--------	4.95E-02
TH-229	Not Detected	--------	2.44E-01

[Summary Report] - Sample ID: 60053704

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.39E-02
AG-110m	Not Detected	--------	4.12E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.02E-02
BA-140	Not Detected	--------	1.33E-01
CD-109	Not Detected	--------	7.12E-01
CD-115	Not Detected	--------	4.93E-01
CE-139	Not Detected	--------	2.59E-02
CE-141	Not Detected	--------	5.24E-02
CE-144	Not Detected	--------	2.08E-01
CO-56	Not Detected	--------	3.15E-02
CO-57	Not Detected	--------	2.78E-02
CO-58	Not Detected	--------	2.94E-02
CO-60	Not Detected	--------	3.09E-02
CR-51	Not Detected	--------	2.30E-01
CS-134	Not Detected	--------	4.03E-02
CS-137	1.73E-01	3.11E-02	2.47E-02
CU-64	Not Detected	--------	6.23E+04
EU-152	Not Detected	--------	7.45E-02
EU-154	Not Detected	--------	1.54E-01
EU-155	Not Detected	--------	1.21E-01
FE-59	Not Detected	--------	6.74E-02
GD-153	Not Detected	--------	9.88E-02
HG-203	Not Detected	--------	2.79E-02
I-131	Not Detected	--------	4.45E-02
IN-115m	Not Detected	--------	1.06E+10
IR-192	Not Detected	--------	2.51E-02
K-40	1.78E+01	2.42	2.81E-01
LA-140	Not Detected	--------	5.37E-01
MN-54	Not Detected	--------	3.09E-02
MN-56	Not Detected	--------	1.22E+18
MO-99	Not Detected	--------	1.26
NA-22	Not Detected	--------	3.58E-02
NA-24	Not Detected	--------	6.68E+01
NB-95	Not Detected	--------	5.51E-01
ND-147	Not Detected	--------	2.53E-01
NI-57	Not Detected	--------	9.85E-01
BE-07	Not Detected	--------	2.31E-01
RU-103	Not Detected	--------	2.74E-02
RU-106	Not Detected	--------	2.36E-01
SB-122	~~8.39E-02~~	~~7.36E-02~~	1.15E-01 Not detected 5/3/96
SB-124	Not Detected	--------	2.91E-02
SB-125	Not Detected	--------	7.16E-02
SC-46	Not Detected	--------	4.49E-02
SR-85	Not Detected	--------	3.32E-02
TA-182	Not Detected	--------	1.30E-01
TA-183	Not Detected	--------	1.06
TE-132	Not Detected	--------	1.05E-01
TL-201	Not Detected	--------	6.83E-01
V-48	Not Detected	--------	4.13E-02
XE-133	Not Detected	--------	9.79E-01
Y-88	Not Detected	--------	2.43E-02
ZN-65	Not Detected	--------	8.60E-02
ZR-95	Not Detected	--------	5.48E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
5-01-96 5:15:57 PM

Analyzed by: 5/3/96 Reviewed by: 5/3/96

Customer : M.YOUNG/E.RANKIN (7584/SMO)
Customer Sample ID : 029041-02
Lab Sample ID : 60053705

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 841.000 gram
Sample Date/Time : 4-24-96 3:00:00 PM
Acquire Start Date : 5-01-96 3:32:34 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6004 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.22
TH-234	1.20	4.38E-01	5.30E-01
RA-226	1.45	4.48E-01	5.92E-01
PB-214	7.04E-01	1.10E-01	5.17E-02
BI-214	6.38E-01	1.04E-01	5.93E-02
TH-232	1.04	4.88E-01	2.33E-01
RA-228	1.11	2.19E-01	1.22E-01
AC-228	1.11	1.97E-01	1.11E-01
TH-228	9.56E-01	2.62E-01	4.41E-01
RA-224	1.10	2.65E-01	7.47E-02
PB-212	1.02	1.68E-01	3.81E-02
BI-212	1.22	3.40E-01	4.13E-01
TL-208	1.00	1.62E-01	1.10E-01
U-235	Not Detected	--------	2.24E-01
TH-231	Not Detected	--------	2.56
PA-231	Not Detected	--------	1.36
TH-227	Not Detected	--------	3.65E-01
RA-223	Not Detected	--------	2.59E-01
RN-219	Not Detected	--------	3.60E-01
PB-211	Not Detected	--------	8.34E-01
TL-207	Not Detected	--------	1.30E+01
AM-241	Not Detected	--------	5.28E-01
PU-239	Not Detected	--------	4.30E+02
NP-237	Not Detected	--------	2.67E-01
PA-233	Not Detected	--------	5.33E-02
TH-229	Not Detected	--------	2.72E-01

[Summary Report] - Sample ID: 60053705

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.91E-02
AG-110m	Not Detected	--------	4.07E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.79E-02
BA-140	Not Detected	--------	1.42E-01
CD-109	Not Detected	--------	9.28E-01
CD-115	Not Detected	--------	5.72E-01
CE-139	Not Detected	--------	2.89E-02
CE-141	Not Detected	--------	5.83E-02
CE-144	Not Detected	--------	2.35E-01
CO-56	Not Detected	--------	3.31E-02
CO-57	Not Detected	--------	3.10E-02
CO-58	Not Detected	--------	3.03E-02
CO-60	Not Detected	--------	3.43E-02
CR-51	Not Detected	--------	2.53E-01
CS-134	Not Detected	--------	4.63E-02
CS-137	1.38E-01	2.91E-02	2.99E-02
CU-64	Not Detected	--------	7.09E+04
EU-152	Not Detected	--------	8.33E-02
EU-154	Not Detected	--------	1.77E-01
EU-155	Not Detected	--------	1.33E-01
FE-59	Not Detected	--------	7.24E-02
GD-153	Not Detected	--------	1.09E-01
HG-203	Not Detected	--------	3.43E-02
I-131	Not Detected	--------	4.68E-02
IN-115m	Not Detected	--------	1.49E+10
IR-192	Not Detected	--------	2.69E-02
K-40	1.92E+01	2.59	2.93E-01
LA-140	Not Detected	--------	6.20E-01
MN-54	Not Detected	--------	3.34E-02
MN-56	Not Detected	--------	1.84E+18
MO-99	Not Detected	--------	1.36
NA-22	Not Detected	--------	3.87E-02
NA-24	Not Detected	--------	7.77E+01
NB-95	Not Detected	--------	6.54E-01
ND-147	Not Detected	--------	2.75E-01
NI-57	Not Detected	--------	1.20
BE-07	Not Detected	--------	2.50E-01
RU-103	Not Detected	--------	2.85E-02
RU-106	Not Detected	--------	2.69E-01
SB-122	Not Detected	--------	2.29E-01
SB-124	Not Detected	--------	3.09E-02
SB-125	Not Detected	--------	7.72E-02
SC-46	Not Detected	--------	5.04E-02
SR-85	Not Detected	--------	3.71E-02
TA-182	Not Detected	--------	1.46E-01
TA-183	Not Detected	--------	1.18
TE-132	Not Detected	--------	1.17E-01
TL-201	Not Detected	--------	7.48E-01
V-48	Not Detected	--------	4.09E-02
XE-133	Not Detected	--------	1.08
Y-88	Not Detected	--------	2.46E-02
ZN-65	Not Detected	--------	9.63E-02
ZR-95	Not Detected	--------	5.86E-02

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

5-02-96 8:30:59 AM

Analyzed by: 5/3/96 Reviewed by: 5/3/96

Customer : M. YOUNG/E. RANKIN (7584/SMO)
Customer Sample ID : 029043-03
Lab Sample ID : 60053706

Sample Description : MARINELLI WATER SAMPLE
Sample Type : Liquid
Sample Geometry : 2WMAR
Sample Quantity : 500.000 mL
Sample Date/Time : 4-24-96 3:15:00 PM
Acquire Start Date : 5-02-96 6:45:17 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6001 seconds

Comments:

Nuclide	Activity (pCi/mL)	2S Error	MDA
U-238	Not Detected	--------	1.78
TH-234	Not Detected	--------	3.81E-01
RA-226	Not Detected	--------	4.64E-01
PB-214	Not Detected	--------	4.18E-02
BI-214	Not Detected	--------	4.69E-02
TH-232	Not Detected	--------	1.28E-01
RA-228	Not Detected	--------	1.36E-01
AC-228	Not Detected	--------	6.74E-02
TH-228	Not Detected	--------	4.23E-01
RA-224	Not Detected	--------	1.04E-01
PB-212	Not Detected	--------	3.50E-02
BI-212	Not Detected	--------	3.20E-01
TL-208	Not Detected	--------	6.16E-02
U-235	Not Detected	--------	1.40E-01
TH-231	Not Detected	--------	1.30
PA-231	Not Detected	--------	9.44E-01
TH-227	Not Detected	--------	1.40E-01
RA-223	Not Detected	--------	1.41E-01
RN-219	Not Detected	--------	2.51E-01
PB-211	Not Detected	--------	5.48E-01
TL-207	Not Detected	--------	8.57
AM-241	Not Detected	--------	3.04E-01
PU-239	Not Detected	--------	2.66E+02
NP-237	Not Detected	--------	1.74E-01
PA-233	Not Detected	--------	3.76E-02
TH-229	Not Detected	--------	1.68E-01

[Summary Report] - Sample ID: 60053706

Nuclide	Activity (pCi/mL)	2S Error	MDA
AG-108m	Not Detected	--------	2.28E-02
AG-110m	Not Detected	--------	1.92E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	2.51E-02
BA-140	Not Detected	--------	9.31E-02
CD-109	Not Detected	--------	6.02E-01
CD-115	Not Detected	--------	3.53E-01
CE-139	Not Detected	--------	1.91E-02
CE-141	Not Detected	--------	3.63E-02
CE-144	Not Detected	--------	1.45E-01
CO-56	Not Detected	--------	3.16E-02
CO-57	Not Detected	--------	1.98E-02
CO-58	Not Detected	--------	2.26E-02
CO-60	Not Detected	--------	2.32E-02
CR-51	Not Detected	--------	1.71E-01
CS-134	Not Detected	--------	2.26E-02
CS-137	4.84E-03	4.12E-02	7.66E-03
CU-64	Not Detected	--------	1.14E+05
EU-152	Not Detected	--------	5.52E-02
EU-154	Not Detected	--------	1.06E-01
EU-155	Not Detected	--------	7.89E-02
FE-59	Not Detected	--------	4.72E-02
GD-153	Not Detected	--------	6.59E-02
HG-203	Not Detected	--------	1.97E-02
I-131	Not Detected	--------	3.34E-02
IN-115m	Not Detected	--------	7.64E+10
IR-192	Not Detected	--------	1.80E-02
K-40	Not Detected	--------	3.04E-01
LA-140	Not Detected	--------	6.38E-01
MN-54	Not Detected	--------	2.24E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.03
NA-22	Not Detected	--------	2.10E-02
NA-24	Not Detected	--------	1.13E+02
NB-95	Not Detected	--------	2.84E-01
ND-147	Not Detected	--------	1.93E-01
NI-57	Not Detected	--------	1.22
BE-07	Not Detected	--------	1.77E-01
RU-103	Not Detected	--------	2.12E-02
RU-106	Not Detected	--------	2.11E-01
SB-122	Not Detected	--------	1.90E-01
SB-124	Not Detected	--------	2.33E-02
SB-125	Not Detected	--------	5.20E-02
SC-46	Not Detected	--------	2.59E-02
SR-85	Not Detected	--------	3.01E-02
TA-182	Not Detected	--------	7.32E-02
TA-183	Not Detected	--------	7.46E-01
TE-132	Not Detected	--------	8.74E-02
TL-201	Not Detected	--------	4.40E-01
V-48	Not Detected	--------	2.90E-02
XE-133	Not Detected	--------	6.87E-01
Y-88	Not Detected	--------	2.90E-02
ZN-65	Not Detected	--------	4.77E-02
ZR-95	Not Detected	--------	3.61E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 5-02-96 10:27:05 AM *
****
*
* Analyzed by: 5/3/96 Reviewed by: 5/3/96 *
****

Customer : M. YOUNG/E. RANKIN (7584/SMO)
Customer Sample ID : 029044-04
Lab Sample ID : 60053707

Sample Description : MARINELLI WATER SAMPLE
Sample Type : Liquid
Sample Geometry : 2WMAR
Sample Quantity : 500.000 mL
Sample Date/Time : 4-24-96 3:15:00 PM
Acquire Start Date : 5-02-96 8:44:40 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6001 seconds

Comments:

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Nuclide	Activity (pCi/mL)	2S Error	MDA
U-238	Not Detected	--------	1.69
TH-234	Not Detected	--------	3.77E-01
RA-226	Not Detected	--------	4.56E-01
PB-214	Not Detected	--------	4.16E-02
BI-214	Not Detected	--------	4.72E-02
TH-232	Not Detected	--------	1.24E-01
RA-228	Not Detected	--------	1.21E-01
AC-228	Not Detected	--------	7.65E-02
TH-228	Not Detected	--------	4.50E-01
RA-224	Not Detected	--------	1.03E-01
PB-212	Not Detected	--------	3.26E-02
BI-212	Not Detected	--------	3.07E-01
TL-208	Not Detected	--------	6.58E-02
U-235	Not Detected	--------	1.47E-01
TH-231	Not Detected	--------	1.26
PA-231	Not Detected	--------	9.05E-01
TH-227	Not Detected	--------	1.30E-01
RA-223	Not Detected	--------	1.35E-01
RN-219	Not Detected	--------	2.38E-01
PB-211	Not Detected	--------	5.34E-01
TL-207	Not Detected	--------	8.09
AM-241	Not Detected	--------	2.85E-01
PU-239	Not Detected	--------	2.75E+02
NP-237	Not Detected	--------	1.68E-01
PA-233	Not Detected	--------	3.82E-02
TH-229	Not Detected	--------	1.68E-01

[Summary Report] - Sample ID: 60053707

Nuclide	Activity (pCi/mL)	2S Error	MDA
AG-108m	Not Detected	--------	2.29E-02
AG-110m	Not Detected	--------	1.93E-02
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	2.52E-02
BA-140	Not Detected	--------	1.01E-01
CD-109	Not Detected	--------	5.60E-01
CD-115	Not Detected	--------	3.35E-01
CE-139	Not Detected	--------	1.85E-02
CE-141	Not Detected	--------	3.78E-02
CE-144	Not Detected	--------	1.49E-01
CO-56	Not Detected	--------	2.92E-02
CO-57	Not Detected	--------	2.08E-02
CO-58	Not Detected	--------	2.27E-02
CO-60	Not Detected	--------	2.26E-02
CR-51	Not Detected	--------	1.73E-01
CS-134	Not Detected	--------	2.32E-02
CS-137	Not Detected	--------	2.07E-02
CU-64	Not Detected	--------	1.33E+05
EU-152	Not Detected	--------	5.56E-02
EU-154	Not Detected	--------	1.04E-01
EU-155	Not Detected	--------	8.34E-02
FE-59	Not Detected	--------	4.51E-02
GD-153	Not Detected	--------	6.73E-02
HG-203	Not Detected	--------	2.06E-02
I-131	Not Detected	--------	3.19E-02
IN-115m	Not Detected	--------	9.60E+10
IR-192	Not Detected	--------	1.83E-02
K-40	Not Detected	--------	3.03E-01
LA-140	Not Detected	--------	6.54E-01
MN-54	Not Detected	--------	2.11E-02
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.18
NA-22	Not Detected	--------	2.16E-02
NA-24	Not Detected	--------	1.18E+02
NB-95	Not Detected	--------	2.69E-01
ND-147	Not Detected	--------	2.01E-01
NI-57	Not Detected	--------	9.21E-01
BE-07	Not Detected	--------	1.72E-01
RU-103	Not Detected	--------	2.09E-02
RU-106	Not Detected	--------	2.16E-01
SB-122	Not Detected	--------	2.00E-01
SB-124	Not Detected	--------	2.38E-02
SB-125	Not Detected	--------	5.67E-02
SC-46	Not Detected	--------	2.75E-02
SR-85	Not Detected	--------	3.02E-02
TA-182	Not Detected	--------	8.14E-02
TA-183	Not Detected	--------	7.15E-01
TE-132	Not Detected	--------	8.82E-02
TL-201	Not Detected	--------	4.39E-01
V-48	Not Detected	--------	2.68E-02
XE-133	Not Detected	--------	6.61E-01
Y-88	Not Detected	--------	2.36E-02
ZN-65	Not Detected	--------	5.16E-02
ZR-95	Not Detected	--------	3.78E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
5-02-96 11:41:27 AM

Analyzed by: 5/3/96 Reviewed by: 5/3/96

Customer : M. YOUNG/E. RANKIN (7584/SMO)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60053708

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 5-02-96 11:28:51 AM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.27E+04
TH-234	Not Detected	--------	4.80E+03
RA-226	Not Detected	--------	6.33E+03
PB-214	Not Detected	--------	6.35E+02
BI-214	Not Detected	--------	6.16E+02
TH-232	Not Detected	--------	2.04E+03
RA-228	Not Detected	--------	2.79E+03
AC-228	Not Detected	--------	1.64E+03
TH-228	Not Detected	--------	4.79E+04
RA-224	Not Detected	--------	1.43E+03
PB-212	Not Detected	--------	3.59E+03
BI-212	Not Detected	--------	3.42E+04
TL-208	Not Detected	--------	6.88E+03
U-235	Not Detected	--------	1.84E+03
TH-231	Not Detected	--------	1.80E+04
PA-231	Not Detected	--------	1.36E+04
TH-227	Not Detected	--------	2.34E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.20E+03
PB-211	Not Detected	--------	1.16E+04
TL-207	Not Detected	--------	2.17E+05
AM-241	9.32E+04	1.60E+04	7.11E+03
PU-239	Not Detected	--------	3.39E+06
NP-237	Not Detected	--------	2.58E+03
PA-233	Not Detected	--------	5.90E+02
TH-229	Not Detected	--------	2.12E+03

[Summary Report] - Sample ID: 60053708

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-108m	Not Detected	--------	3.51E+02
AG-110m	Not Detected	--------	4.01E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.57E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.07E+05	1.31E+05	1.87E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	5.87E+06
CE-141	Not Detected	--------	1.68E+21
CE-144	Not Detected	--------	2.48E+05
CO-56	Not Detected	--------	2.56E+10
CO-57	Not Detected	--------	4.26E+04
CO-58	Not Detected	--------	1.22E+11
CO-60	7.46E+04	9.72E+03	5.61E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	1.84E+03
CS-137	6.68E+04	8.64E+03	4.46E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.18E+03
EU-154	Not Detected	--------	2.41E+03
EU-155	Not Detected	--------	2.33E+03
FE-59	Not Detected	--------	3.34E+16
GD-153	Not Detected	--------	2.58E+05
HG-203	Not Detected	--------	2.42E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	4.20E+10
K-40	Not Detected	--------	1.71E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.19E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	9.98E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	7.11E+14
RU-103	Not Detected	--------	8.22E+17
RU-106	Not Detected	--------	1.27E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	3.20E+12
SB-125	Not Detected	--------	4.30E+03
SC-46	Not Detected	--------	7.31E+09
SR-85	Not Detected	--------	7.11E+11
TA-182	Not Detected	--------	2.31E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	8.11E+07
ZN-65	Not Detected	--------	2.77E+05
ZR-95	Not Detected	--------	1.64E+12

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 5-02-96 11:45:26 AM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 60053708
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 5-02-96 11:28:51 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
AM-241 Activity	9.300E-02	3.965E-03	9.324E-02	<	:	:	: >
CS-137 Activity	6.850E-02	2.040E-03	6.680E-02	<	:	:	: >
CO-60 Activity	7.503E-02	1.567E-03	7.481E-02	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 5/3/96

Underground Conduit System
Features 58K, 58W, 58AA, 58BB, 58EEE, and 58FFF

RMMA NOT

Internal Lab Batch No. 61376

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

SF 2001-COC (6-95)

AR/COC- 04959

Dept. No./Mail Stop: 7585 / MS 1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: EE/1332/58/DAT
Logbook Ref No: 0155
Service Order No.: CF0180 Ame

Date Samples Shipped: 4/10/96
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: CCF
SMO Contact/Phone: Doug Salmi / 848-0963
Send Report to SMO Deborah McLaughlin

Contract No.: AT
Case No.: 362240
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location Tech Area III Foothills Test Area
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested: GAMMA SPEC	Lab Sample ID
028341-02	58UCS-GR-017-4.7-SS	4.7	58	4/9/96 1340	Soil	Poly	500ml	4°	C	SA	X	
028346-02	58UCS-GR-016-4.7-SS	4.7	58	4/9/96 1425	Soil	Poly	500ml	4°	C	SA	X	
028347-02	58UCS-GR-015-4.7-SS	4.7	58	4/9/96 1500	Soil	Poly	500ml	4°	C	SA	X	
028350-03	58UCS-GR-015-FB	-	58	4/9/96 1505	Water	Poly	500ml	4°	G	FB	X	

RMMA ☒ Yes ☐ No Ref. No. _____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush Required Report Date _____

Sample Tracking
Date Entered (mm/dd/yy) 4/16/96
Entered by: Ame
QC inits. _____

Special Instructions/QC Requirements
This is an RMMA.
This COC # 04959 will release COC # 04981 to GEL
SEND REPORT TO MIKE YOUNG

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Coretta Coccieto	Coretta Coccieto	CC	Lemo / 7584 / 294-3301

1. Relinquished by	Coretta Coccieto	Org.	7584	Date	4/10/96	Time	1945	4. Relinquished by	Org. Date Time
1. Received by		Org.	SNL 7513	Date	4/10/96	Time	1711	4. Received by	Org. Date Time
2. Relinquished by		Org.	SNL 7513	Date	4/10/96	Time	1117	5. Relinquished by	Org. Date Time
2. Received by		Org.	SNL 7713	Date	4/10/96	Time	1117	5. Received by	Org. Date Time
3. Relinquished by		Org.	SNL 7717	Date	4/11/96	Time	1015	6. Relinquished by	Org. Date Time
3. Received by		Org.	SNL 7513	Date	4/11/96	Time	1015	6. Received by	Org. Date Time

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics 584CS

Sample Analysis Request Form

To be completed by Customer — *Shaded areas are for RPSD use only*

Customer: Mike Young
Organization: 7585
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed: 4-11-96
Suspect Isotopes:
Other Information: Coc# 04959

Hazards/Special Instructions: 24 HOUR TURN AROUND 4/11/96

Batch Log Number: 600396
Logged By: [signature]
Analysis Type:
LIMS Login
Results Faxed
Sample Disposal

☒ Gamma Spec
☐ H-3
☐ Alpha/Beta
☐ Alpha Spec
☐ Total U
☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
028341-02	Soil	4/9/96 1340	500ml	Gamma Spec	01	<300	771 g	Det 02
028346-02	Soil	1425	"	"	02	↓	725 g	Det 03
028347-02	Soil	1500	"	"	03	↓	837 g	Det 02
028350-03	Water	↓ 1505	"	"	04	<300	N/A	Det 03
LCS	—	11Apr96		LCS	05,06	N/A	N/A	05-Det02, 06-Det03

Relinquished by [signature]	Date 4/10/96	Time ~~0940~~ 1117	Received by [signature]	Date 4/10/96	Time 1117
Relinquished by [signature]	Date 4/11/96	Time 1015	Received by [signature]	Date 4/11/96	Time 1015
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time

****
*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program [881 Laboratory]
* 4-10-96 2:00:00 PM
*
****

* Analyzed by: 4/11/96 Reviewed by: 4/11/96 *

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 028341-02
Lab Sample ID : 60039601

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 771.000 gram
Sample Date/Time : 4-09-96 1:40:00 PM
Acquire Start Date : 4-10-96 12:15:10 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.96
TH-234	8.71E-01	2.74E-01	4.91E-01
RA-226	Not Detected	--------	8.29E-01
PB-214	5.51E-01	9.19E-02	5.80E-02
BI-214	4.90E-01	9.60E-02	4.20E-02
TH-232	7.37E-01	3.60E-01	2.30E-01
RA-228	8.11E-01	3.25E-01	1.44E-01
AC-228	7.92E-01	1.49E-01	9.67E-02
TH-228	8.82E-01	2.47E-01	4.00E-01
RA-224	8.37E-01	2.11E-01	7.98E-02
PB-212	7.91E-01	1.34E-01	3.41E-02
BI-212	9.20E-01	2.68E-01	3.19E-01
TL-208	7.56E-01	1.26E-01	5.83E-02
U-235	Not Detected	--------	2.08E-01
TH-231	Not Detected	--------	2.50
PA-231	Not Detected	--------	1.30
TH-227	Not Detected	--------	3.39E-01
RA-223	Not Detected	--------	1.73E-01
RN-219	Not Detected	--------	3.42E-01
PB-211	Not Detected	--------	8.05E-01
TL-207	Not Detected	--------	1.22E+01
AM-241	Not Detected	--------	4.95E-01
PU-239	~~6.60E+02~~	~~4.01E+02~~	5.93E+02
NP-237	Not Detected	--------	2.39E-01
PA-233	Not Detected	--------	5.15E-02
TH-229	Not Detected	--------	2.60E-01

Not detected 4/11/96

[Summary Report] - Sample ID: 60039601

Nuclide	Activity (pCi/gram)	2S Error	MDA	
AG-108m	Not Detected	--------	3.84E-02	
AG-110m	Not Detected	--------	3.03E-02	
AR-41	Not Detected	--------	2.61E+02	
BA-133	Not Detected	--------	5.44E-02	
BA-140	Not Detected	--------	9.51E-02	
CD-109	Not Detected	--------	8.23E-01	
CD-115	Not Detected	--------	7.94E-02	
CE-139	Not Detected	--------	2.65E-02	
CE-141	Not Detected	--------	4.84E-02	
CE-144	Not Detected	--------	2.18E-01	
CO-56	Not Detected	--------	3.21E-02	
CO-57	Not Detected	--------	2.89E-02	
CO-58	Not Detected	--------	2.77E-02	
CO-60	Not Detected	--------	3.42E-02	
CR-51	Not Detected	--------	2.08E-01	
CS-134	Not Detected	--------	1.48E-02	
CS-137	1.86E-02	1.53E-02	2.38E-02	
CU-64	Not Detected	--------	2.46E+01	
EU-152	Not Detected	--------	7.74E-02	
EU-154	Not Detected	--------	1.74E-01	
EU-155	Not Detected	--------	1.26E-01	
FE-59	Not Detected	--------	6.65E-02	
GD-153	Not Detected	--------	1.02E-01	
HG-203	Not Detected	--------	2.67E-02	
I-131	Not Detected	--------	2.66E-02	
IN-115m	Not Detected	--------	2.20	
IR-192	Not Detected	--------	2.48E-02	
K-40	1.70E+01	2.32	2.70E-01	
LA-140	Not Detected	--------	4.83E-02	
MN-54	Not Detected	--------	1.47E-02	
MN-56	Not Detected	--------	1.73E+01	
MO-99	Not Detected	--------	2.84E-01	
NA-22	~~1.67E-02~~	~~1.86E-02~~	2.97E-02	Not detected J 4/11/96
NA-24	Not Detected	--------	8.57E-02	
NB-95	Not Detected	--------	1.89E-01	
ND-147	Not Detected	--------	1.87E-01	
NI-57	Not Detected	--------	6.41E-02	
BE-07	Not Detected	--------	2.18E-01	
RU-103	Not Detected	--------	2.55E-02	
RU-106	Not Detected	--------	2.51E-01	
SB-122	Not Detected	--------	4.79E-02	
SB-124	~~7.45E-03~~	~~6.19E-03~~	1.50E-02	Not detected J 4/11/96
SB-125	Not Detected	--------	7.51E-02	
SC-46	Not Detected	--------	4.82E-02	
SR-85	Not Detected	--------	3.37E-02	
TA-182	Not Detected	--------	1.40E-01	
TA-183	Not Detected	--------	4.84E-01	
TE-132	Not Detected	--------	3.10E-02	
TL-201	Not Detected	--------	1.80E-01	
V-48	Not Detected	--------	3.53E-02	
XE-133	Not Detected	--------	1.53E-01	
Y-88	Not Detected	--------	2.54E-02	
ZN-65	Not Detected	--------	9.42E-02	
ZR-95	Not Detected	--------	5.14E-02	

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

4-10-96 2:00:54 PM

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Analyzed by: 4/11/96 Reviewed by: 4/11/96

****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 028346-02
Lab Sample ID : 60039602

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 725.000 gram
Sample Date/Time : 4-09-96 2:25:00 PM
Acquire Start Date : 4-10-96 12:17:33 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.19
TH-234	Not Detected	--------	4.87E-01
RA-226	1.43	4.05E-01	4.58E-01
PB-214	6.36E-01	1.40E-01	7.96E-02
BI-214	5.43E-01	1.06E-01	8.15E-02
TH-232	9.45E-01	4.74E-01	2.71E-01
RA-228	9.32E-01	2.31E-01	1.56E-01
AC-228	8.77E-01	1.72E-01	1.12E-01
TH-228	8.23E-01	3.79E-01	5.03E-01
RA-224	8.71E-01	2.42E-01	9.13E-02
PB-212	9.15E-01	1.97E-01	3.81E-02
BI-212	7.14E-01	3.36E-01	4.78E-01
TL-208	8.91E-01	1.67E-01	1.22E-01
U-235	Not Detected	--------	1.79E-01
TH-231	Not Detected	--------	1.53
PA-231	Not Detected	--------	1.33
TH-227	Not Detected	--------	3.88E-01
RA-223	Not Detected	--------	1.12E-01
RN-219	Not Detected	--------	3.97E-01
PB-211	Not Detected	--------	9.03E-01
TL-207	Not Detected	--------	1.61E+01
AM-241	Not Detected	--------	1.51E-01
PU-239	Not Detected	--------	3.30E+02
NP-237	Not Detected	--------	2.39E-01
PA-233	Not Detected	--------	5.77E-02
TH-229	Not Detected	--------	1.82E-01

[Summary Report] - Sample ID: 60039602

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.60E-02
AG-110m	Not Detected	--------	3.59E-02
AR-41	Not Detected	--------	2.66E+02
BA-133	Not Detected	--------	5.70E-02
BA-140	Not Detected	--------	1.22E-01
CD-109	Not Detected	--------	5.63E-01
CD-115	Not Detected	--------	9.24E-02
CE-139	Not Detected	--------	2.47E-02
CE-141	Not Detected	--------	4.09E-02
CE-144	Not Detected	--------	1.74E-01
CO-56	Not Detected	--------	3.63E-02
CO-57	Not Detected	--------	2.20E-02
CO-58	Not Detected	--------	3.40E-02
CO-60	Not Detected	--------	4.07E-02
CR-51	Not Detected	--------	2.28E-01
CS-134	Not Detected	--------	5.34E-02
CS-137	Not Detected	--------	4.02E-02
CU-64	Not Detected	--------	2.88E+01
EU-152	Not Detected	--------	8.66E-02
EU-154	Not Detected	--------	2.00E-01
EU-155	Not Detected	--------	8.80E-02
FE-59	Not Detected	--------	8.33E-02
GD-153	Not Detected	--------	6.81E-02
HG-203	Not Detected	--------	2.79E-02
I-131	Not Detected	--------	3.27E-02
IN-115m	Not Detected	--------	2.32
IR-192	Not Detected	--------	2.75E-02
K-40	1.79E+01	2.49	4.55E-01
LA-140	Not Detected	--------	5.87E-02
MN-54	Not Detected	--------	3.86E-02
MN-56	Not Detected	--------	1.62E+01
MO-99	Not Detected	--------	3.43E-01
NA-22	Not Detected	--------	4.84E-02
NA-24	Not Detected	--------	9.86E-02
NB-95	Not Detected	--------	2.16E-01
ND-147	Not Detected	--------	2.19E-01
NI-57	Not Detected	--------	8.06E-02
BE-07	Not Detected	--------	2.62E-01
RU-103	Not Detected	--------	3.06E-02
RU-106	Not Detected	--------	3.07E-01
SB-122	Not Detected	--------	5.60E-02
SB-124	Not Detected	--------	3.39E-02
SB-125	Not Detected	--------	8.55E-02
SC-46	Not Detected	--------	5.84E-02
SR-85	Not Detected	--------	4.15E-02
TA-182	Not Detected	--------	1.74E-01
TA-183	Not Detected	--------	1.45E-01
TE-132	Not Detected	--------	3.03E-02
TL-201	Not Detected	--------	9.10E-02
V-48	Not Detected	--------	4.00E-02
XE-133	Not Detected	--------	9.07E-02
Y-88	Not Detected	--------	2.91E-02
ZN-65	Not Detected	--------	1.15E-01
ZR-95	Not Detected	--------	6.64E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-10-96 3:44:16 PM *
****
*
* Analyzed by: 4/11/96 Reviewed by: 4/11/96 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 028347-02
Lab Sample ID : 60039603

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 837.000 gram
Sample Date/Time : 4-09-96 3:00:00 PM
Acquire Start Date : 4-10-96 2:00:53 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.95
TH-234	8.98E-01	5.46E-01	5.69E-01
RA-226	Not Detected	--------	5.99E-01
PB-214	5.93E-01	9.80E-02	6.24E-02
BI-214	5.59E-01	9.24E-02	5.31E-02
TH-232	8.90E-01	4.14E-01	1.83E-01
RA-228	6.29E-01	1.56E-01	1.31E-01
AC-228	7.63E-01	1.45E-01	9.83E-02
TH-228	7.92E-01	2.40E-01	4.19E-01
RA-224	7.58E-01	1.90E-01	6.29E-02
PB-212	7.22E-01	1.21E-01	3.25E-02
BI-212	7.35E-01	2.74E-01	3.72E-01
TL-208	6.40E-01	1.08E-01	7.44E-02
U-235	Not Detected	--------	2.05E-01
TH-231	Not Detected	--------	2.36
PA-231	Not Detected	--------	1.28
TH-227	Not Detected	--------	3.18E-01
RA-223	Not Detected	--------	1.64E-01
RN-219	Not Detected	--------	3.45E-01
PB-211	Not Detected	--------	7.97E-01
TL-207	Not Detected	--------	1.21E+01
AM-241	Not Detected	--------	4.72E-01
PU-239	~~6.63E+02~~	~~3.55E+02~~	5.11E+02 Not detected
NP-237	Not Detected	--------	2.36E-01
PA-233	Not Detected	--------	4.96E-02
TH-229	Not Detected	--------	2.49E-01

4/11/96

[Summary Report] - Sample ID: 60039603

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.54E-02
AG-110m	Not Detected	--------	2.91E-02
AR-41	Not Detected	--------	2.84E+02
BA-133	Not Detected	--------	5.23E-02
BA-140	Not Detected	--------	9.95E-02
CD-109	Not Detected	--------	8.10E-01
CD-115	Not Detected	--------	7.80E-02
CE-139	Not Detected	--------	2.61E-02
CE-141	Not Detected	--------	4.79E-02
CE-144	Not Detected	--------	2.08E-01
CO-56	Not Detected	--------	3.06E-02
CO-57	Not Detected	--------	2.78E-02
CO-58	Not Detected	--------	2.80E-02
CO-60	Not Detected	--------	3.31E-02
CR-51	Not Detected	--------	1.97E-01
CS-134	Not Detected	--------	4.40E-02
CS-137	3.05E-02	2.86E-02	1.95E-02
CU-64	Not Detected	--------	2.41E+01
EU-152	Not Detected	--------	7.65E-02
EU-154	Not Detected	--------	1.58E-01
EU-155	Not Detected	--------	1.22E-01
FE-59	Not Detected	--------	6.34E-02
GD-153	Not Detected	--------	1.00E-01
HG-203	Not Detected	--------	2.59E-02
I-131	Not Detected	--------	2.61E-02
IN-115m	Not Detected	--------	2.30
IR-192	Not Detected	--------	2.34E-02
K-40	1.82E+01	2.46	3.32E-01
LA-140	Not Detected	--------	4.55E-02
MN-54	Not Detected	--------	2.92E-02
MN-56	Not Detected	--------	1.84E+01
MO-99	Not Detected	--------	2.86E-01
NA-22	Not Detected	--------	3.78E-02
NA-24	Not Detected	--------	9.03E-02
NB-95	Not Detected	--------	1.78E-01
ND-147	Not Detected	--------	1.82E-01
NI-57	Not Detected	--------	6.84E-02
BE-07	Not Detected	--------	2.12E-01
RU-103	Not Detected	--------	2.32E-02
RU-106	Not Detected	--------	2.43E-01
SB-122	Not Detected	--------	4.51E-02
SB-124	Not Detected	--------	2.77E-02
SB-125	Not Detected	--------	7.34E-02
SC-46	Not Detected	--------	4.50E-02
SR-85	Not Detected	--------	3.24E-02
TA-182	Not Detected	--------	1.34E-01
TA-183	Not Detected	--------	4.67E-01
TE-132	Not Detected	--------	2.92E-02
TL-201	Not Detected	--------	1.80E-01
V-48	Not Detected	--------	3.00E-02
XE-133	Not Detected	--------	1.48E-01
Y-88	Not Detected	--------	2.39E-02
ZN-65	Not Detected	--------	8.89E-02
ZR-95	Not Detected	--------	5.07E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-10-96 3:44:56 PM *
****
*
* Analyzed by: 4/11/96 Reviewed by: 4/11/96 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 028350-03
Lab Sample ID : 60039604

Sample Description : MARINELLI LIQUID SAMPLE
Sample Type : Liquid
Sample Geometry : 3WMAR
Sample Quantity : 500.000 mL
Sample Date/Time : 4-09-96 3:05:00 PM
Acquire Start Date : 4-10-96 2:02:47 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6001 seconds

Comments:

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Nuclide	Activity (pCi/mL)	2S Error	MDA
U-238	Not Detected	--------	5.34E-01
TH-234	Not Detected	--------	2.20E-01
RA-226	Not Detected	--------	3.51E-01
PB-214	Not Detected	--------	4.34E-02
BI-214	Not Detected	--------	5.36E-02
TH-232	Not Detected	--------	1.25E-01
RA-228	Not Detected	--------	1.45E-01
AC-228	Not Detected	--------	9.20E-02
TH-228	Not Detected	--------	3.79E-01
RA-224	Not Detected	--------	1.29E-01
PB-212	Not Detected	--------	2.94E-02
BI-212	Not Detected	--------	3.41E-01
TL-208	Not Detected	--------	6.59E-02
U-235	Not Detected	--------	1.03E-01
TH-231	Not Detected	--------	6.22E-01
PA-231	Not Detected	--------	6.86E-01
TH-227	Not Detected	--------	1.17E-01
RA-223	Not Detected	--------	4.59E-02
RN-219	Not Detected	--------	2.27E-01
PB-211	Not Detected	--------	5.47E-01
TL-207	Not Detected	--------	8.82
AM-241	Not Detected	--------	6.63E-02
PU-239	Not Detected	--------	1.74E+02
NP-237	Not Detected	--------	9.07E-02
PA-233	Not Detected	--------	3.57E-02
TH-229	Not Detected	--------	8.39E-02

[Summary Report] - Sample ID: 60039604

Nuclide	Activity (pCi/mL)	2S Error	MDA
AG-108m	Not Detected	--------	2.71E-02
AG-110m	Not Detected	--------	2.04E-02
AR-41	Not Detected	--------	2.54E+02
BA-133	Not Detected	--------	2.49E-02
BA-140	Not Detected	--------	7.31E-02
CD-109	Not Detected	--------	2.96E-01
CD-115	Not Detected	--------	4.21E-02
CE-139	Not Detected	--------	1.34E-02
CE-141	Not Detected	--------	2.28E-02
CE-144	Not Detected	--------	9.66E-02
CO-56	Not Detected	--------	2.62E-02
CO-57	Not Detected	--------	1.34E-02
CO-58	Not Detected	--------	1.94E-02
CO-60	Not Detected	--------	2.75E-02
CR-51	Not Detected	--------	1.42E-01
CS-134	Not Detected	--------	2.48E-02
CS-137	Not Detected	--------	2.31E-02
CU-64	Not Detected	--------	1.68E+01
EU-152	Not Detected	--------	5.11E-02
EU-154	Not Detected	--------	1.22E-01
EU-155	Not Detected	--------	4.87E-02
FE-59	Not Detected	--------	4.65E-02
GD-153	Not Detected	--------	3.23E-02
HG-203	Not Detected	--------	1.51E-02
I-131	Not Detected	--------	2.01E-02
IN-115m	Not Detected	--------	1.23
IR-192	Not Detected	--------	1.63E-02
K-40	Not Detected	--------	2.94E-01
LA-140	Not Detected	--------	4.13E-02
MN-54	Not Detected	--------	2.65E-02
MN-56	Not Detected	--------	1.56E+01
MO-99	Not Detected	--------	2.08E-01
NA-22	Not Detected	--------	2.58E-02
NA-24	Not Detected	--------	9.18E-02
NB-95	Not Detected	--------	6.55E-02
ND-147	Not Detected	--------	1.25E-01
NI-57	Not Detected	--------	5.40E-02
BE-07	Not Detected	--------	1.68E-01
RU-103	Not Detected	--------	1.95E-02
RU-106	Not Detected	--------	2.13E-01
SB-122	Not Detected	--------	3.27E-02
SB-124	Not Detected	--------	2.48E-02
SB-125	Not Detected	--------	5.35E-02
SC-46	Not Detected	--------	2.84E-02
SR-85	Not Detected	--------	3.10E-02
TA-182	Not Detected	--------	8.41E-02
TA-183	Not Detected	--------	6.40E-02
TE-132	Not Detected	--------	1.66E-02
TL-201	Not Detected	--------	3.30E-02
V-48	Not Detected	--------	2.62E-02
XE-133	Not Detected	--------	3.75E-02
Y-88	Not Detected	--------	3.19E-02
ZN-65	Not Detected	--------	5.18E-02
ZR-95	Not Detected	--------	3.75E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-10-96 4:15:43 PM *
****
*
* Analyzed by: 4/11/96 Reviewed by: 4/11/96 *
****

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60039606

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 4-10-96 4:03:26 PM
Detector Name : LAB03
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Comments:

****

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	6.39E+03
TH-234	Not Detected	--------	2.76E+03
RA-226	Not Detected	--------	5.70E+03
PB-214	Not Detected	--------	7.11E+02
BI-214	Not Detected	--------	7.33E+02
TH-232	Not Detected	--------	2.16E+03
RA-228	Not Detected	--------	3.30E+03
AC-228	Not Detected	--------	1.89E+03
TH-228	Not Detected	--------	4.63E+04
RA-224	Not Detected	--------	1.62E+03
PB-212	Not Detected	--------	3.48E+03
BI-212	Not Detected	--------	3.70E+04
TL-208	Not Detected	--------	7.31E+03
U-235	Not Detected	--------	1.42E+03
TH-231	Not Detected	--------	9.09E+03
PA-231	Not Detected	--------	1.36E+04
TH-227	Not Detected	--------	2.29E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.63E+03
PB-211	Not Detected	--------	1.26E+04
TL-207	Not Detected	--------	2.55E+05
AM-241	8.93E+04	1.41E+04	2.04E+03
PU-239	Not Detected	--------	2.49E+06
NP-237	Not Detected	--------	1.47E+03
PA-233	Not Detected	--------	6.05E+02
TH-229	Not Detected	--------	1.28E+03

[Summary Report] - Sample ID: 60039606

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-108m	Not Detected	--------	3.76E+02
AG-110m	Not Detected	--------	4.37E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.22E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	2.65E+05	8.33E+04	1.08E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	4.55E+06
CE-141	Not Detected	--------	8.09E+20
CE-144	Not Detected	--------	1.77E+05
CO-56	Not Detected	--------	2.50E+10
CO-57	Not Detected	--------	2.99E+04
CO-58	Not Detected	--------	1.13E+11
CO-60	7.39E+04	9.69E+03	6.96E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	2.09E+03
CS-137	6.73E+04	8.75E+03	7.15E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.29E+03
EU-154	Not Detected	--------	2.54E+03
EU-155	Not Detected	--------	1.49E+03
FE-59	Not Detected	--------	2.80E+16
GD-153	Not Detected	--------	1.47E+05
HG-203	Not Detected	--------	1.79E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.61E+10
K-40	Not Detected	--------	1.63E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.57E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	1.01E+03
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	5.90E+14
RU-103	Not Detected	--------	6.15E+17
RU-106	Not Detected	--------	1.43E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	2.92E+12
SB-125	Not Detected	--------	4.47E+03
SC-46	Not Detected	--------	7.19E+09
SR-85	Not Detected	--------	6.30E+11
TA-182	Not Detected	--------	2.37E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	7.88E+07
ZN-65	Not Detected	--------	3.06E+05
ZR-95	Not Detected	--------	1.47E+12

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 4-10-96 4:18:29 PM
QA File : C:\GENIEPC\CAMFILES\LCS3.QAF
Analyst : FCD
Sample ID : 60039606
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 4-10-96 4:03:26 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
AM-241 Activity	8.619E-02	1.367E-02	8.925E-02	<	:	:	: >
CS-137 Activity	6.701E-02	5.272E-04	6.729E-02	<	:	:	: >
CO-60 Activity	7.431E-02	6.232E-04	7.395E-02	<	:	:	: >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 4/11/96

SF 2001-COC (6-95)

Internal Lab Batch No. 600240

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC- 04999

Dept. No./Mail Stop: 7585 (1148)
Project/Task Manager: Mike Young (7585)
Project Name: Foot Hills Test Area
Record Center Code: ER/1333/55/DAT
Logbook Ref No:
Service Order No.: CF0180

Date Samples Shipped: 3/19/96 (SMO USE)
Carrier/Waybill No.: HC
Lab Contact: Amir Mohaghegh
Lab Destination: Amir
SMO Contact/Phone: Doug Salmi (848-0963)
Send Report to SMO: D. McLaughlin

Contract No.: N/A
Case No.: 8835.110
SMO Authorization: [signature]
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Location Tech Area Foothills
Building ____ Room ____

Reference LOV (available at SMO)

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
028371-02	58MH-GR-001-4-SS	4	MH 58	3-15-96 1435	Soil	P	500ml	none	G	SA	X	
028373-02	58MH-GR-002-4.5SS	4.5	MH 58	3-14-96 1505	↓	↓	↓	↓	↓	SA	X	
028374-02	58MH-GR-003-4.5-SS	4.5	MH 58	3-14-96 0950	↓	↓	↓	↓	↓	↓	X	
028375-02	58MH-GR-004-4-SS	4	MH 58	3-14-96 1025	↓	↓	↓	↓	↓	↓	X	
028376-02	58MH-GR-005-4-SS	4	MH 58	3-14-96 1110	↓	↓	↓	↓	↓	↓	X	LAB USE
-												
-												
-												
-												
-												

RMMA ☐ Yes ☒ No Ref. No. ____
Sample Disposal ☒ Return to Client ☐ Disposal by lab
Turnaround Time ☐ Normal ☒ Rush Required Report Date ____

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ____
Entered by: ____
QC Inits. ____

Special Instructions/QC Requirements
Send report to Mike Young (1148) and to Ed Curtis (SMO)
Need 24 hour Turn-A-Round
This COC 04999 releases COC # 05000

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members: Name	Signature	Init	Company/Organization/Phone
Red Nagel	[signature]	RN	I.T./7584
Jim Calvert	[signature]	JC	Lamb/7584/[illegible]
[illegible]	[signature]	[illegible]	[illegible]

	Org.	Date	Time		Org.	Date	Time
1. Relinquished by Jim Calvert	7584	3/19/96	13:37	4. Relinquished by			
1. Received by [signature]	MN07513	3/19/96	1337	4. Received by			
2. Relinquished by [signature]	MN07513	3/19/96	1337	5. Relinquished by			
2. Received by [signature]	SNL 7713	3/19/96	1337	5. Received by			
3. Relinquished by				6. Relinquished by			
3. Received by				6. Received by			

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 7585
Project Location: Site 58 Rod or C.C.
Phone: 284-3301
Date Results Needed:
Suspect Isotopes: none
Other Information: 04999

Hazards/Special Instructions:
Need 24 Hour Turn. Around releases C.O.C. 05000

C.O.C 04999

Batch Log Number: 600240
Logged By: Snee

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
028371-02	Soil	3-18-96 1435	500ml	Gamma Spec	01	<300	887	
028373-02	↓	3-18-96 1505	↓	↓	02	↓	746	
028374-02		3-19-96 0950			03		635	
028375-02		3-19-96 1025			04		433	
028376-02	↓	3-19-96 1110	↓	↓	05	<300	448	
LCS	—	1 Nov 50	—	γ spec	06/07	NA	NA	06-Det02 07-Det03
				Notified SHO of Mechanical problems Snee, 3/19/96				

Relinquished by: [signature] Date 3/19/96 Time 1337 Received by: [signature] Date 3/19/96 Snee Time 1337
Relinquished by: [signature] Date 3/21/96 Time 0910 Received by: [signature] Date 3/21/96 Time 0910
Relinquished by: _____ Date _____ Time _____ Received by: _____ Date _____ Time _____
Relinquished by: _____ Date _____ Time _____ Received by: _____ Date _____ Time _____

SF 2001-COC (6-95)

Internal Lab Batch No. 600240

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC- 04999

Dept. No./Mail Stop: 7585 (4US)	Date Samples Shipped: 3/19/96 (SMO USE)	Contract No.: N/A	
Project/Task Manager: Mike Young (7585)	Carrier/Waybill No.: HC	Case No.: 7585.110	
Project Name: [illegible]	Lab Contact: [illegible]	SMO Authorization: [illegible]	
Record Center Code: ER/1333/SS/DAT	Lab Destination: [illegible]	Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154	
Logbook Ref No:	SMO Contact/Phone: [illegible] (848-0763)		
Service Order No.: [illegible]	Send Report to SMO: [illegible]		

Location Tech Area [illegible]

Building ______ Room ______

Reference LOV (available at SMO)

Parameter & Method Requested

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	[illegible]										Lab Sample ID
028371-02	SSMH-GR-001-4-SS	4	MH SS	3-18-96 1435	Soil	P	500ml	none	G	SA	X										
028373-02	SSMH-GR-002-4.5SS	4.5	MH SS	3-18-96 1505	↓	↓	↓	↓	↓	SA	X										
028374-02	SSMH-GR-003-4.5-SS	4.5	MH SS	3-19-96 0955	↓	↓	↓	↓	↓	↓	X										
028375-02	SSMH-GR-004-4-SS	4	MH SS	3-19-96 1035	↓	↓	↓	↓	↓	↓	X										
028376-02	SSMH-GR-005-4-SS	4	MH SS	3-19-96 1110	↓	↓	↓	↓	↓	↓	X										LAB USE
-																					
-																					
-																					
-																					
-																					

RMMA ☐ Yes ☒ No Ref. No. ______

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush Required Report Date ______

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ______
Entered by: ______
QC inits. ______

Special Instructions/QC Requirements
Send report to Mike Young (4US) and to Ed Collins (SMO). Need 24 hour Turn-A-Round. This COC 04999 [illegible] COC # 05006

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members: Name	Signature	Init	Company/Organization/Phone
[illegible]	[signature]	[illegible]	IT/7584
Jim Calvert	[signature]	JC	[illegible]
[illegible]	[signature]	[illegible]	[illegible]

	Org.	Date	Time		Org.	Date	Time
1. Relinquished by Jim Calvert	7584	3/19/96	13:37	4. Relinquished by			
1. Received by [signature]	7513	3/19/96	1337	4. Received by			
2. Relinquished by [signature]	7513	3/19/96	1337	5. Relinquished by			
2. Received by [signature]	7713	3/19/96	1337	5. Received by			
3. Relinquished by				6. Relinquished by			
3. Received by				6. Received by			

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

AR/COC- 04999

Internal Lab Batch No. 600240

SF 2801-COC (6-95)

Dept. No./Mail Stop: 7585 (1148)
Project/Task Manager: Mike Young (7585)
Project Name: Foot Hills Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No:
Service Order No.: CF0180

Date Samples Shipped: 3/19/96
Carrier/Waybill No.: NC
Lab Contact: Amir Mohagheghi
Lab Destination: Amir
SMO Contact/Phone: Doug Salmi (848-0963)
Send Report to SMO: D. McLaughlin

Contract No.: N/A
Case No.: 8835.110
SMO Authorization:
Bill to: Sandia National Laboratories, Supplier Services Department, P.O. Box 5800 MS 0154, Albuquerque, NM 87185-0154

Parameter & Method Requested: Gamma Spec

Location — Tech Area: Foothills — Building: — Room:

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
0283711-02	58MH-GR-001-4-SS	4	MH 58	3-18-96 1435	Soil	P	500ml	none	G	SA	X	
0283723-02	58MH-GR-002-4.5-SS	4.5	MH 58	3-18-96 1505						SA	X	
0283734-02	58MH-GR-003-4.5-SS	4.5	MH 58	3-19-96 0950							X	
0283745-02	58MH-GR-004-4-SS	4	MH 58	3-19-96 1025							X	
0283756-02	58MH-GR-005-4-SS	4	MH 58	3-19-96 1110							X	

RMMA ☐ Yes ☒ No Ref. No.

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush Required Report Date — QC Initials.

Sample Tracking
Date Entered (mm/dd/yy):
Entered by:

Special Instructions/QC Requirements
- Send report to Mike Young and to Ed Rankin (SMO) (1148)
- Need 24 hour Turn-A-Round
- This COC. 04999 releases coc # 05000

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Rod Nagel	Rod Nagel	RN	I.T. / 7582
	Jim Calvert	Jim Calvert		Lanl / 7584 / 2843301
	Karen DeVoss	Karen DeVoss	KD	Lanl / 7584 / 2843301

1. Relinquished by	Jim Calvert	Org.	7584	Date	3/19/96	Time	13:37	4. Relinquished by	Org.	Date	Time
1. Received by		Org.	SNL 7513	Date	3/19/96	Time	1337	4. Received by Connie Carreto	Org. 7584	Date 3-26-96	Time 14:45
2. Relinquished by		Org.	SNL 7513	Date	3/19/96	Time	1337	5. Relinquished by	Org.	Date	Time
2. Received by	Doug Cole	Org.	SNL 7713	Date	3/19/96	Time	1337	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	SNL 7713	Date	3/21/96	Time	0910	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	7513	Date	3/21/96	Time	0910	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

Date: 3/26/96

No. of Pages: 11
(Including Cover)

Fax to:	Richard Kottenstette	From:	Angela Chavez
Org/Company:		Org:	7513
Phone:		Phone:	(505) 848-0995
Fax:	284-2616	Fax:	(505) 848-0535

Note:

Sandia National Laboratories
Sample Management Office
P.O. Box 5800
Albuquerque, New Mexico 87185-1331

****
*** ACTIVITY REPORT ***
****

TRANSMISSION OK

TX/RX NO.	5373
CONNECTION TEL	92842616
CONNECTION ID	
START TIME	03/26 16:05
USAGE TIME	05'49
PAGES	11
RESULT	OK

ARCOC 4999 release + ARCOC 95-### FOR GEL

****
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-20-96 6:24:39 PM
****

Analyzed by: [signature] 3/21/96 Reviewed by: [signature] 3/21/96
****

Customer : M. YOUNG/ E. RANKIN (7585/SMO)
Customer Sample ID : 028371-02
Lab Sample ID : 60024001

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 887.000 gram
Sample Date/Time : 3-18-96 2:35:00 PM
Acquire Start Date : 3-20-96 4:39:55 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	8.40E-01
TH-234	5.35E-01	1.91E-01	2.52E-01
RA-226	7.21E-01	2.97E-01	4.08E-01
PB-214	3.73E-01	8.42E-02	5.03E-02
BI-214	4.01E-01	7.89E-02	5.91E-02
TH-232	5.08E-01	2.73E-01	2.10E-01
RA-228	4.07E-01	1.75E-01	1.29E-01
AC-228	4.89E-01	1.17E-01	1.15E-01
TH-228	Not Detected	--------	5.04E-01
RA-224	4.42E-01	1.35E-01	7.27E-02
PB-212	4.28E-01	1.06E-01	2.99E-02
BI-212	4.12E-01	2.68E-01	4.06E-01
TL-208	3.77E-01	8.02E-02	6.68E-02
U-235	Not Detected	--------	1.31E-01
TH-231	Not Detected	--------	1.11
PA-231	Not Detected	--------	9.62E-01
TH-227	Not Detected	--------	2.44E-01
RA-223	Not Detected	--------	8.49E-02
RN-219	Not Detected	--------	3.00E-01
PB-211	Not Detected	--------	6.75E-01
TL-207	Not Detected	--------	1.07E+01
AM-241	Not Detected	--------	1.04E-01
PU-239	Not Detected	--------	2.36E+02
NP-237	Not Detected	--------	1.60E-01
PA-233	Not Detected	--------	4.20E-02
TH-229	Not Detected	--------	1.26E-01

[Summary Report] - Sample ID: 60024001

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.13E-02
AR-41	Not Detected	--------	8.37E+06
BA-133	Not Detected	--------	4.30E-02
BA-140	Not Detected	--------	9.09E-02
CD-109	Not Detected	--------	4.11E-01
CD-115	Not Detected	--------	9.57E-02
CE-139	Not Detected	--------	1.85E-02
CE-141	Not Detected	--------	3.14E-02
CE-144	Not Detected	--------	1.27E-01
CO-56	Not Detected	--------	2.82E-02
CO-57	Not Detected	--------	1.63E-02
CO-58	Not Detected	--------	2.50E-02
CO-60	Not Detected	--------	2.95E-02
CR-51	Not Detected	--------	1.75E-01
CS-134	Not Detected	--------	3.96E-02
CS-137	1.75E-01	3.33E-02	2.56E-02
CU-64	Not Detected	--------	9.58E+01
EU-152	Not Detected	--------	1.97E-01
EU-154	Not Detected	--------	1.34E-01
EU-155	Not Detected	--------	6.48E-02
FE-59	Not Detected	--------	5.88E-02
GD-153	Not Detected	--------	4.80E-02
HG-203	Not Detected	--------	2.12E-02
I-131	Not Detected	--------	2.63E-02
IN-115m	Not Detected	--------	1.30E+02
IR-192	Not Detected	--------	2.03E-02
K-40	1.26E+01	1.76	2.99E-01
LA-140	Not Detected	--------	6.92E-02
MN-54	Not Detected	--------	2.85E-02
MN-56	Not Detected	--------	2.43E+04
MO-99	Not Detected	--------	3.26E-01
NA-22	Not Detected	--------	3.47E-02
NA-24	Not Detected	--------	2.76E-01
NB-95	Not Detected	--------	1.70E-01
ND-147	Not Detected	--------	1.74E-01
NI-57	Not Detected	--------	1.02E-01
BE-07	Not Detected	--------	2.00E-01
RU-103	Not Detected	--------	2.19E-02
RU-106	Not Detected	--------	2.36E-01
SB-122	Not Detected	--------	5.28E-02
SB-124	Not Detected	--------	2.52E-02
SB-125	Not Detected	--------	6.23E-02
SC-46	Not Detected	--------	4.17E-02
SR-85	Not Detected	--------	3.00E-02
TA-182	Not Detected	--------	1.22E-01
TA-183	Not Detected	--------	1.18E-01
TE-132	Not Detected	--------	3.02E-02
TL-201	Not Detected	--------	8.40E-02
V-48	Not Detected	--------	3.44E-02
XE-133	Not Detected	--------	9.59E-02
Y-88	Not Detected	--------	2.40E-02
ZN-65	Not Detected	--------	8.13E-02
ZR-95	Not Detected	--------	4.88E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-20-96 6:26:16 PM

Analyzed by: 3/21/96 Reviewed by: 3/21/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 028373-02
Lab Sample ID : 60024002

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 746.000 gram
Sample Date/Time : 3-18-96 3:05:00 PM
Acquire Start Date : 3-20-96 4:42:39 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.24
TH-234	8.62E-01	3.42E-01	5.39E-01
RA-226	1.14	6.46E-01	9.88E-01
PB-214	4.97E-01	8.59E-02	6.04E-02
BI-214	4.25E-01	8.12E-02	7.01E-02
TH-232	7.11E-01	3.54E-01	2.44E-01
RA-228	8.30E-01	2.53E-01	1.52E-01
AC-228	7.38E-01	1.49E-01	1.18E-01
TH-228	9.39E-01	2.64E-01	4.15E-01
RA-224	8.30E-01	2.13E-01	1.01E-01
PB-212	7.64E-01	1.29E-01	3.90E-02
BI-212	9.53E-01	2.67E-01	3.07E-01
TL-208	6.76E-01	1.20E-01	9.68E-02
U-235	Not Detected	--------	2.24E-01
TH-231	Not Detected	--------	2.54
PA-231	Not Detected	--------	1.35
TH-227	Not Detected	--------	3.55E-01
RA-223	Not Detected	--------	1.87E-01
RN-219	~~9.88E-02~~	~~7.99E-02~~	1.64E-01
PB-211	Not Detected	--------	8.66E-01
TL-207	Not Detected	--------	1.28E+01
AM-241	Not Detected	--------	5.13E-01
PU-239	Not Detected	--------	4.24E+02
NP-237	Not Detected	--------	2.50E-01
PA-233	Not Detected	--------	5.84E-02
TH-229	Not Detected	--------	2.70E-01

not detected 3/21/96

[Summary Report] - Sample ID: 60024002

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	4.31E-02
AR-41	Not Detected	--------	7.41E+06
BA-133	Not Detected	--------	5.84E-02
BA-140	Not Detected	--------	1.15E-01
CD-109	Not Detected	--------	8.63E-01
CD-115	Not Detected	--------	1.20E-01
CE-139	Not Detected	--------	2.86E-02
CE-141	Not Detected	--------	5.25E-02
CE-144	Not Detected	--------	2.27E-01
CO-56	~~3.80E-02~~	~~1.79E-02~~	2.57E-02 Not detected 3/21/96
CO-57	Not Detected	--------	3.04E-02
CO-58	Not Detected	--------	2.95E-02
CO-60	Not Detected	--------	3.48E-02
CR-51	Not Detected	--------	2.24E-01
CS-134	Not Detected	--------	4.67E-02
CS-137	1.43E-01	3.84E-02	4.85E-02
CU-64	Not Detected	--------	1.02E+02
EU-152	Not Detected	--------	2.38E-01
EU-154	Not Detected	--------	1.75E-01
EU-155	Not Detected	--------	1.33E-01
FE-59	Not Detected	--------	6.97E-02
GD-153	Not Detected	--------	1.07E-01
HG-203	Not Detected	--------	2.80E-02
I-131	Not Detected	--------	3.14E-02
IN-115m	Not Detected	--------	1.53E+02
IR-192	Not Detected	--------	2.68E-02
K-40	1.49E+01	2.06	4.44E-01
LA-140	Not Detected	--------	8.03E-02
MN-54	Not Detected	--------	3.20E-02
MN-56	Not Detected	--------	2.48E+04
MO-99	Not Detected	--------	4.09E-01
NA-22	Not Detected	--------	3.96E-02
NA-24	Not Detected	--------	3.18E-01
NB-95	Not Detected	--------	2.46E-01
ND-147	Not Detected	--------	2.15E-01
NI-57	Not Detected	--------	1.24E-01
BE-07	Not Detected	--------	2.40E-01
RU-103	Not Detected	--------	2.65E-02
RU-106	Not Detected	--------	2.60E-01
SB-122	Not Detected	--------	6.49E-02
SB-124	Not Detected	--------	2.96E-02
SB-125	Not Detected	--------	7.94E-02
SC-46	Not Detected	--------	4.98E-02
SR-85	Not Detected	--------	3.56E-02
TA-182	Not Detected	--------	1.46E-01
TA-183	Not Detected	--------	5.89E-01
TE-132	Not Detected	--------	4.07E-02
TL-201	Not Detected	--------	2.47E-01
V-48	Not Detected	--------	3.43E-02
XE-133	Not Detected	--------	2.23E-01
Y-88	Not Detected	--------	2.47E-02
ZN-65	Not Detected	--------	9.77E-02
ZR-95	Not Detected	--------	5.47E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-20-96 8:16:00 PM *
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* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *

Customer : M. YOUNG/ E. RANKIN (7585/SMO)
Customer Sample ID : 028374-02
Lab Sample ID : 60024003

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 635.000 gram
Sample Date/Time : 3-19-96 9:50:00 AM
Acquire Start Date : 3-20-96 6:30:29 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6002 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.10
TH-234	9.36E-01	2.77E-01	3.46E-01
RA-226	1.11	4.58E-01	5.17E-01
PB-214	5.12E-01	1.20E-01	8.66E-02
BI-214	4.72E-01	9.81E-02	8.20E-02
TH-232	5.42E-01	2.98E-01	2.44E-01
RA-228	6.73E-01	2.00E-01	1.53E-01
AC-228	5.84E-01	1.39E-01	1.28E-01
TH-228	5.50E-01	2.89E-01	4.21E-01
RA-224	5.79E-01	1.84E-01	1.21E-01
PB-212	5.93E-01	1.36E-01	3.79E-02
BI-212	Not Detected	--------	5.57E-01
TL-208	5.43E-01	1.14E-01	9.34E-02
U-235	~~7.36E-02~~	~~1.19E-01~~	1.68E-01 Not detected 3/21/96
TH-231	Not Detected	--------	1.38
PA-231	Not Detected	--------	1.23
TH-227	Not Detected	--------	3.36E-01
RA-223	Not Detected	--------	1.04E-01
RN-219	Not Detected	--------	3.88E-01
PB-211	Not Detected	--------	8.67E-01
TL-207	Not Detected	--------	1.46E+01
AM-241	Not Detected	--------	1.30E-01
PU-239	Not Detected	--------	2.95E+02
NP-237	Not Detected	--------	2.12E-01
PA-233	Not Detected	--------	5.77E-02
TH-229	Not Detected	--------	1.57E-01

[Summary Report] - Sample ID: 60024003

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	5.28E-02
AR-41	Not Detected	--------	1.42E+04
BA-133	Not Detected	--------	5.69E-02
BA-140	Not Detected	--------	1.15E-01
CD-109	Not Detected	--------	5.53E-01
CD-115	Not Detected	--------	9.65E-02
CE-139	Not Detected	--------	2.37E-02
CE-141	Not Detected	--------	3.87E-02
CE-144	Not Detected	--------	1.64E-01
CO-56	Not Detected	--------	3.50E-02
CO-57	Not Detected	--------	2.08E-02
CO-58	Not Detected	--------	3.47E-02
CO-60	Not Detected	--------	3.98E-02
CR-51	Not Detected	--------	2.32E-01
CS-134	Not Detected	--------	5.25E-02
CS-137	1.93E-01	4.46E-02	2.52E-02
CU-64	Not Detected	--------	5.02E+01
EU-152	Not Detected	--------	2.45E-01
EU-154	Not Detected	--------	1.70E-01
EU-155	Not Detected	--------	7.84E-02
FE-59	Not Detected	--------	7.38E-02
GD-153	Not Detected	--------	6.06E-02
HG-203	Not Detected	--------	2.57E-02
I-131	Not Detected	--------	3.36E-02
IN-115m	Not Detected	--------	1.12E+01
IR-192	Not Detected	--------	2.71E-02
K-40	1.25E+01	1.79	4.24E-01
LA-140	Not Detected	--------	7.25E-02
MN-54	Not Detected	--------	3.50E-02
MN-56	Not Detected	--------	2.82E+02
MO-99	Not Detected	--------	3.61E-01
NA-22	Not Detected	--------	4.54E-02
NA-24	Not Detected	--------	1.64E-01
NB-95	Not Detected	--------	2.04E-01
ND-147	Not Detected	--------	2.12E-01
NI-57	Not Detected	--------	9.81E-02
BE-07	Not Detected	--------	2.48E-01
RU-103	Not Detected	--------	1.00E-02
RU-106	Not Detected	--------	3.21E-01
SB-122	Not Detected	--------	5.70E-02
SB-124	Not Detected	--------	3.41E-02
SB-125	Not Detected	--------	8.34E-02
SC-46	Not Detected	--------	5.45E-02
SR-85	Not Detected	--------	4.12E-02
TA-182	Not Detected	--------	1.59E-01
TA-183	Not Detected	--------	1.33E-01
TE-132	Not Detected	--------	3.06E-02
TL-201	Not Detected	--------	9.05E-02
V-48	Not Detected	--------	3.88E-02
XE-133	Not Detected	--------	9.62E-02
Y-88	Not Detected	--------	3.29E-02
ZN-65	Not Detected	--------	1.06E-01
ZR-95	Not Detected	--------	6.24E-02

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
3-20-96 8:20:32 PM

Analyzed by: 3/21/96 Reviewed by: 3/21/96

Customer : M.YOUNG/E.RANKIN (7585/SMO)
Customer Sample ID : 028375-02
Lab Sample ID : 60024004

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 433.000 gram
Sample Date/Time : 3-19-96 10:25:00 AM
Acquire Start Date : 3-20-96 6:32:52 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6002 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.58
TH-234	Not Detected	--------	7.46E-01
RA-226	Not Detected	--------	1.32
PB-214	4.36E-01	1.03E-01	1.16E-01
BI-214	3.85E-01	9.62E-02	1.10E-01
TH-232	9.04E-01	4.71E-01	3.77E-01
RA-228	6.92E-01	2.13E-01	1.93E-01
AC-228	7.85E-01	1.81E-01	1.71E-01
TH-228	4.92E-01	3.19E-01	7.55E-01
RA-224	8.50E-01	2.40E-01	1.45E-01
PB-212	9.30E-01	1.70E-01	6.18E-02
BI-212	7.31E-01	3.47E-01	4.89E-01
TL-208	7.10E-01	1.53E-01	1.57E-01
U-235	9.43E-02	8.83E-02	1.78E-01
TH-231	Not Detected	--------	3.77
PA-231	Not Detected	--------	2.11
TH-227	Not Detected	--------	5.16E-01
RA-223	Not Detected	--------	2.68E-01
RN-219	Not Detected	--------	5.98E-01
PB-211	Not Detected	--------	1.39
TL-207	Not Detected	--------	1.89E+01
AM-241	Not Detected	--------	7.40E-01
PU-239	Not Detected	--------	4.25E+02
NP-237	Not Detected	--------	3.82E-01
PA-233	Not Detected	--------	8.60E-02
TH-229	Not Detected	--------	3.91E-01

[Summary Report] - Sample ID: 60024004

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.29E-01
AR-41	Not Detected	--------	1.31E+04
BA-133	Not Detected	--------	8.43E-02
BA-140	Not Detected	--------	1.64E-01
CD-109	Not Detected	--------	1.32
CD-115	Not Detected	--------	1.40E-01
CE-139	Not Detected	--------	4.11E-02
CE-141	Not Detected	--------	7.41E-02
CE-144	Not Detected	--------	3.27E-01
CO-56	~~5.70E-02~~	~~2.58E-02~~	3.60E-02 Not detected 3/21/96
CO-57	Not Detected	--------	4.31E-02
CO-58	Not Detected	--------	4.16E-02
CO-60	Not Detected	--------	4.66E-02
CR-51	Not Detected	--------	3.38E-01
CS-134	Not Detected	--------	6.70E-02
CS-137	1.40	1.93E-01	5.66E-02
CU-64	Not Detected	--------	5.87E+01
EU-152	Not Detected	--------	3.56E-01
EU-154	Not Detected	--------	2.49E-01
EU-155	Not Detected	--------	1.87E-01
FE-59	Not Detected	--------	9.14E-02
GD-153	Not Detected	--------	1.58E-01
HG-203	Not Detected	--------	4.27E-02
I-131	Not Detected	--------	4.70E-02
IN-115m	Not Detected	--------	1.50E+01
IR-192	Not Detected	--------	3.97E-02
K-40	1.43E+01	2.06	7.00E-01
LA-140	Not Detected	--------	8.76E-02
MN-54	Not Detected	--------	4.59E-02
MN-56	Not Detected	--------	3.51E+02
MO-99	Not Detected	--------	4.62E-01
NA-22	Not Detected	--------	5.26E-02
NA-24	Not Detected	--------	2.10E-01
NB-95	Not Detected	--------	3.11E-01
ND-147	Not Detected	--------	3.03E-01
NI-57	Not Detected	--------	1.18E-01
BE-07	Not Detected	--------	4.13E-01
RU-103	Not Detected	--------	4.20E-02
RU-106	Not Detected	--------	3.97E-01
SB-122	Not Detected	--------	8.49E-02
SB-124	Not Detected	--------	4.73E-02
SB-125	Not Detected	--------	1.35E-01
SC-46	Not Detected	--------	6.58E-02
SR-85	Not Detected	--------	5.67E-02
TA-182	Not Detected	--------	1.95E-01
TA-183	Not Detected	--------	7.76E-01
TE-132	Not Detected	--------	5.12E-02
TL-201	Not Detected	--------	2.97E-01
V-48	Not Detected	--------	4.39E-02
XE-133	Not Detected	--------	2.62E-01
Y-88	Not Detected	--------	3.70E-02
ZN-65	Not Detected	--------	1.30E-01
ZR-95	Not Detected	--------	8.01E-02

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* Sandia National Laboratories *

* Radiation Protection Sample Diagnostics Program [881 Laboratory] *

* 3 20-96 10:00:13 PM *

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* Analyzed by: 7/21/96 Reviewed by: 7/21/96 *

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Customer : M. YOUNG/ E. RANKIN (7585/SMO)
Customer Sample ID : 028376-02
Lab Sample ID : 60024005

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 3SMAR
Sample Quantity : 448.000 gram
Sample Date/Time : 3-19-96 11:10:00 AM
Acquire Start Date : 3-20-96 8:16:30 PM
Detector Name : LAB03
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	1.74
TH-234	1.53	4.17E-01	5.48E-01
RA-226	2.73	9.09E-01	1.18
PB-214	7.04E-01	1.72E-01	1.39E-01
BI-214	7.55E-01	1.47E-01	1.02E-01
TH-232	1.15	5.72E-01	3.04E-01
RA-228	1.01	2.96E-01	2.19E-01
AC-228	1.06	2.27E-01	1.77E-01
TH-228	1.21	6.73E-01	9.60E-01
RA-224	1.05	3.12E-01	1.74E-01
PB-212	1.11	2.45E-01	5.79E-02
BI-212	1.38	4.66E-01	5.72E-01
TL-208	1.01	2.17E-01	2.04E-01
U-235	Not Detected	--------	2.54E-01
TH-231	Not Detected	--------	2.21
PA-231	Not Detected	--------	2.16
TH-227	Not Detected	--------	5.43E-01
RA-223	Not Detected	--------	1.68E-01
RN-219	Not Detected	--------	6.91E-01
PB-211	Not Detected	--------	1.57
TL-207	Not Detected	--------	2.09E+01
AM-241	Not Detected	--------	2.17E-01
PU-239	Not Detected	--------	4.82E+02
NP-237	Not Detected	--------	3.45E-01
PA-233	Not Detected	--------	9.38E-02
TH-229	Not Detected	--------	2.53E-01

[Summary Report] - Sample ID: 60024005

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	--------	1.99E-01
AR-41	Not Detected	--------	2.50E+04
BA-133	Not Detected	--------	9.21E-02
BA-140	Not Detected	--------	1.92E-01
CD-109	Not Detected	--------	8.86E-01
CD-115	Not Detected	--------	1.70E-01
CE-139	Not Detected	--------	3.68E-02
CE-141	Not Detected	--------	5.81E-02
CE-144	Not Detected	--------	2.51E-01
CO-56	Not Detected	--------	5.03E-02
CO-57	Not Detected	--------	3.05E-02
CO-58	Not Detected	--------	4.83E-02
CO-60	Not Detected	--------	5.69E-02
CR-51	Not Detected	--------	3.69E-01
CS-134	Not Detected	--------	7.83E-02
CS-137	2.96	4.18E-01	6.56E-02
CU-64	Not Detected	--------	7.64E+01
EU-152	Not Detected	--------	3.82E-01
EU-154	Not Detected	--------	2.63E-01
EU-155	Not Detected	--------	1.27E-01
FE-59	Not Detected	--------	1.11E-01
GD-153	Not Detected	--------	9.67E-02
HG-203	Not Detected	--------	4.47E-02
I-131	Not Detected	--------	5.83E-02
IN 115m	Not Detected	--------	2.09E+01
IR-192	Not Detected	--------	4.27E-02
K-40	1.74E+01	2.51	6.31E-01
LA-140	Not Detected	--------	1.01E-01
MN 54	Not Detected	--------	2.72E-02
MN-56	Not Detected	--------	4.56E+02
MO-99	Not Detected	--------	5.50E-01
NA-22	Not Detected	--------	6.69E-02
NA-24	Not Detected	--------	2.27E-01
NB-95	Not Detected	--------	3.31E-01
ND-147	Not Detected	--------	3.61E-01
NI-57	Not Detected	--------	1.41E-01
BE-07	Not Detected	--------	5.10E-01
RU-103	Not Detected	--------	5.24E-02
RU-106	Not Detected	--------	4.81E-01
SB-122	Not Detected	--------	9.35E-02
SB-124	Not Detected	--------	5.33E-02
SB-125	Not Detected	--------	1.59E-01
SC-46	Not Detected	--------	8.02E-02
SR-85	Not Detected	--------	6.61E-02
TA-182	Not Detected	--------	2.36E-01
TA-183	Not Detected	--------	2.23E-01
TE-132	Not Detected	--------	5.22E-02
TL-201	Not Detected	--------	1.45E-01
V-48	Not Detected	--------	5.79E-02
XE-133	Not Detected	--------	1.56E-01
Y-88	Not Detected	--------	4.22E-02
ZN-65	Not Detected	--------	1.56E-01
ZR-95	Not Detected	--------	8.72E-02

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 3-21-96 6:40:45 AM *
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* Analyzed by: 3/21/96 Reviewed by: 3/21/96 *

Customer : M. YOUNG/ E. RANKIN (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60024007

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 3-21-96 6:28:36 AM
Detector Name : LAB03
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Comments:

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Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	6.41E+03
TH-234	Not Detected	--------	2.73E+03
RA-226	Not Detected	--------	5.82E+03
PB-214	Not Detected	--------	7.23E+02
BI-214	Not Detected	--------	7.13E+02
TH-232	Not Detected	--------	2.13E+03
RA-228	Not Detected	--------	3.18E+03
AC-228	Not Detected	--------	1.93E+03
TH-228	Not Detected	--------	4.52E+04
RA-224	Not Detected	--------	1.84E+03
PB-212	Not Detected	--------	3.37E+03
BI-212	Not Detected	--------	3.50E+04
TL-208	Not Detected	--------	6.93E+03
U-235	Not Detected	--------	1.44E+03
TH-231	Not Detected	--------	8.95E+03
PA-231	Not Detected	--------	1.36E+04
TH-227	Not Detected	--------	2.25E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.47E+03
PB-211	Not Detected	--------	1.26E+04
TL-207	Not Detected	--------	2.49E+05
AM-241	8.89E+04	1.40E+04	2.07E+03
PU-239	Not Detected	--------	2.52E+06
NP-237	Not Detected	--------	1.49E+03
PA-233	Not Detected	--------	6.17E+02
TH-229	Not Detected	--------	1.27E+03

[Summary Report] - Sample ID: 60024007

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	--------	4.10E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	6.13E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.35E+05	8.28E+04	9.13E+04
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	4.18E+06
CE-141	Not Detected	--------	5.41E+20
CE-144	Not Detected	--------	1.68E+05
CO-56	Not Detected	--------	2.13E+10
CO-57	Not Detected	--------	2.89E+04
CO-58	Not Detected	--------	9.35E+10
CO-60	7.53E+04	9.87E+03	5.90E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	2.04E+03
CS-137	6.74E+04	8.75E+03	5.55E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	3.91E+03
EU-154	Not Detected	--------	2.56E+03
EU-155	Not Detected	--------	1.52E+03
FE-59	Not Detected	--------	2.05E+16
GD-153	Not Detected	--------	1.33E+05
HG-203	Not Detected	--------	1.33E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.04E+10
K-40	Not Detected	--------	1.58E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.42E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	1.04E+03
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	4.52E+14
RU-103	Not Detected	--------	4.29E+17
RU-106	Not Detected	--------	1.40E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	2.28E+12
SB-125	Not Detected	--------	4.43E+03
SC-46	Not Detected	--------	6.17E+09
SR-85	Not Detected	--------	5.00E+11
TA-182	Not Detected	--------	2.13E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	6.74E+07
ZN-65	Not Detected	--------	2.92E+05
ZR-95	Not Detected	--------	1.17E+12

****
*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program
* Quality Assurance Report
*
****

Report Date : 3-21-96 6:43:26 AM
QA File : C:\GENIEPC\CAMFILES\LCS3.QAF
Analyst : FCD
Sample ID : 60024007
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 3-21-96 6:28:36 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
AM-241 Activity	8.577E-02	1.444E-02	8.894E-02	<	:	:	: >
CS-137 Activity	6.701E-02	5.477E-04	6.737E-02	<	:	:	: >
CO-60 Activity	7.431E-02	6.309E-04	7.437E-02	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 3/21/96

RMMA RCRA
Internal Lab
Batch No. 6044/28

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC- 05088

SF 2001-COC (6-95)

Dept. No./Mail Stop: 7585 / ms 1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: ER/1332/58/DAT
Logbook Ref No: 0155
Service Order No.: CF0180 Vmc

Date Samples Shipped: 4-12-96
Carrier/Waybill No.: H&C
Lab Contact: Fernando Dominguez
Lab Destination: CCF
SMO Contact/Phone: Doug Salmi/848-0963
Send Report to SMO Deborah McLaughlin

Contract No.: NA
Case No.: 3622.400
SMO Authorization: DMcLaughlin
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

GAMMA SPEC

Location Tech Area III
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	GAMMA SPEC	Lab Sample ID
028852-02	SWMS-GC-DR-4.7-SS	4.7	58	4/10/96 1330	Soil	Poly	500ml	4°	G	SA	X	
028853-02	SWMS-GC-011-4.7-SS	4.7	58	4/10/96 1520	Soil	Poly	500ml	4°	G	SA	X	

RMMA ☒ Yes ☐ No Ref. No. ____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush Required Report Date 4/15/96

Sample Tracking
Date Entered (mm/dd/yy) 4/16/96 Vmc
Entered by: ____
QC Inits: ____

Special Instructions/QC Requirements
This is an RMMA.
This COC # 05088 will release
COC # 05086 to GEL

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciato	Concetta Cacciato	CC	Lamb/7585/284-3301
	Rod Nagel	Rod Nagel	RN	IT/7584

1. Relinquished by	Concetta Cacciato	Org. 1584	Date 4/12/96	Time 0950	4. Relinquished by		Org.	Date	Time
1. Received by		Org. 7513	Date 4/12/96	Time 0955	4. Received by		Org.	Date	Time
2. Relinquished by		Org. 7513	Date 4/12/96	Time 1025	5. Relinquished by		Org.	Date	Time
2. Received by		Org. 7713	Date 4/12/96	Time 1025	5. Received by		Org.	Date	Time
3. Relinquished by		Org. SMO 7713	Date 4/15/96	Time 0840	6. Relinquished by		Org.	Date	Time
3. Received by		Org. SMO 7513	Date 4/16/96	Time 0840	6. Received by		Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics 584CS

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 7585
Project Location: Foothills Testarea
Phone: 284-2595
Date Results Needed: 4-15-96
Suspect Isotopes:
Other Information: CoC# 05088

Hazards/Special Instructions:
NEED 24 HOUR TURN A ROUND

Batch Log Number: 600128
Logged By: SBE

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
028852-02	Soil	4/10/96 1330	500ml	Gamma Spec.	01	<300	816	
028853-02	Soil	4/10/96 1520	500ml	Gamma Spec.	02	<300	871	
LCS		1 NOV 20	—	γ	03.	NA	NA	

Relinquished by [signature] Date 4/12/96 Time 1025 Received by S.B.Ebara Date 4/12/96 Time 10:25
Relinquished by [signature] Date 4/15/96 Time 0840 Received by D.M.Young Date 4/15/96 Time 0840
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-12-96 3:26:49 PM *
****
*
* Analyzed by: 4/15/96 Reviewed by: 4/15/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 028852-02
Lab Sample ID : 60042801

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 816.000 gram
Sample Date/Time : 4-10-96 1:30:00 PM
Acquire Start Date : 4-12-96 1:33:20 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.94
TH-234	9.22E-01	3.36E-01	4.75E-01
RA-226	Not Detected	--------	6.73E-01
PB-214	5.10E-01	8.49E-02	5.25E-02
BI-214	4.97E-01	8.50E-02	3.93E-02
TH-232	6.76E-01	3.41E-01	2.52E-01
RA-228	7.68E-01	1.94E-01	1.20E-01
AC-228	6.88E-01	1.38E-01	1.10E-01
TH-228	8.89E-01	2.58E-01	3.88E-01
RA-224	6.58E-01	1.69E-01	6.37E-02
PB-212	7.17E-01	1.20E-01	3.23E-02
BI-212	9.18E-01	3.30E-01	4.49E-01
TL-208	6.45E-01	1.09E-01	7.33E-02
U-235	Not Detected	--------	2.02E-01
TH-231	Not Detected	--------	2.40
PA-231	Not Detected	--------	1.27
TH-227	Not Detected	--------	3.18E-01
RA-223	Not Detected	--------	1.75E-01
RN-219	Not Detected	--------	3.30E-01
PB-211	Not Detected	--------	7.66E-01
TL-207	Not Detected	--------	1.13E+01
AM-241	Not Detected	--------	4.76E-01
PU-239	Not Detected	--------	4.22E+02
NP-237	Not Detected	--------	2.26E-01
PA-233	Not Detected	--------	5.14E-02
TH-229	Not Detected	--------	2.50E-01

[Summary Report] - Sample ID: 60042801

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.56E-02
AG-110m	Not Detected	--------	3.78E-02
AR-41	Not Detected	--------	3.85E+06
BA-133	Not Detected	--------	5.04E-02
BA-140	Not Detected	--------	1.02E-01
CD-109	Not Detected	--------	7.77E-01
CD-115	Not Detected	--------	1.05E-01
CE-139	Not Detected	--------	2.58E-02
CE-141	Not Detected	--------	4.74E-02
CE-144	Not Detected	--------	2.03E-01
CO-56	Not Detected	--------	3.02E-02
CO-57	Not Detected	--------	2.77E-02
CO-58	Not Detected	--------	2.77E-02
CO-60	Not Detected	--------	3.23E-02
CR-51	Not Detected	--------	2.06E-01
CS-134	Not Detected	--------	4.20E-02
CS-137	1.44E-01	2.78E-02	2.46E-02
CU-64	Not Detected	--------	9.03E+01
EU-152	Not Detected	--------	7.70E-02
EU-154	Not Detected	--------	1.60E-01
EU-155	Not Detected	--------	1.20E-01
FE-59	Not Detected	--------	6.34E-02
GD-153	Not Detected	--------	9.85E-02
HG-203	Not Detected	--------	2.61E-02
I-131	Not Detected	--------	2.95E-02
IN-115m	Not Detected	--------	1.07E+02
IR-192	Not Detected	--------	2.42E-02
K-40	1.67E+01	2.28	2.96E-01
LA-140	Not Detected	--------	6.86E-02
MN-54	Not Detected	--------	3.03E-02
MN-56	Not Detected	--------	1.51E+04
MO-99	Not Detected	--------	3.55E-01
NA-22	Not Detected	--------	3.84E-02
NA-24	Not Detected	--------	2.76E-01
NB-95	Not Detected	--------	2.18E-01
ND-147	Not Detected	--------	1.93E-01
NI-57	Not Detected	--------	9.91E-02
BE-07	Not Detected	--------	2.17E-01
RU-103	Not Detected	--------	2.44E-02
RU-106	Not Detected	--------	2.52E-01
SB-122	~~2.22E-02~~	~~4.23E-02~~	2.98E-02 Not detected 4/15/96
SB-124	Not Detected	--------	2.75E-02
SB-125	Not Detected	--------	7.28E-02
SC-46	Not Detected	--------	4.27E-02
SR-85	Not Detected	--------	3.34E-02
TA-182	Not Detected	--------	1.27E-01
TA-183	Not Detected	--------	5.40E-01
TE-132	Not Detected	--------	3.79E-02
TL-201	Not Detected	--------	2.19E-01
V-48	Not Detected	--------	3.18E-02
XE-133	Not Detected	--------	2.07E-01
Y-88	Not Detected	--------	2.15E-02
ZN-65	Not Detected	--------	8.41E-02
ZR-95	Not Detected	--------	5.02E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-12-96 5:07:33 PM *
****
*
* Analyzed by: 4/15/96 Reviewed by: 4/15/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 028853-02
Lab Sample ID : 60042802

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 871.000 gram
Sample Date/Time : 4-10-96 3:20:00 PM
Acquire Start Date : 4-12-96 3:23:41 PM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

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Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	2.76
TH-234	8.47E-01	3.02E-01	4.19E-01
RA-226	Not Detected	--------	6.34E-01
PB-214	5.26E-01	8.68E-02	5.34E-02
BI-214	4.61E-01	7.90E-02	5.12E-02
TH-232	7.72E-01	3.56E-01	1.14E-01
RA-228	8.64E-01	1.79E-01	1.04E-01
AC-228	7.40E-01	1.45E-01	1.11E-01
TH-228	6.72E-01	2.01E-01	3.54E-01
RA-224	7.52E-01	1.91E-01	8.09E-02
PB-212	7.52E-01	1.25E-01	3.08E-02
BI-212	8.44E-01	2.26E-01	2.50E-01
TL-208	6.83E-01	1.13E-01	7.35E-02
U-235	Not Detected	--------	1.95E-01
TH-231	Not Detected	--------	2.21
PA-231	Not Detected	--------	1.21
TH-227	Not Detected	--------	3.14E-01
RA-223	Not Detected	--------	1.64E-01
RN-219	Not Detected	--------	3.22E-01
PB-211	Not Detected	--------	7.56E-01
TL-207	Not Detected	--------	1.15E+01
AM-241	Not Detected	--------	4.55E-01
PU-239	Not Detected	--------	4.04E+02
NP-237	Not Detected	--------	2.05E-01
PA-233	Not Detected	--------	4.75E-02
TH-229	Not Detected	--------	2.45E-01

[Summary Report] - Sample ID: 60042802

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	3.38E-02
AG-110m	Not Detected	--------	2.73E-02
AR-41	Not Detected	--------	3.63E+06
BA-133	Not Detected	--------	4.85E-02
BA-140	Not Detected	--------	9.99E-02
CD-109	Not Detected	--------	7.06E-01
CD-115	Not Detected	--------	1.05E-01
CE-139	Not Detected	--------	2.52E-02
CE-141	Not Detected	--------	4.61E-02
CE-144	Not Detected	--------	2.02E-01
CO-56	Not Detected	--------	2.96E-02
CO-57	Not Detected	--------	2.73E-02
CO-58	Not Detected	--------	2.71E-02
CO-60	Not Detected	--------	3.08E-02
CR-51	Not Detected	--------	1.89E-01
CS-134	Not Detected	--------	3.92E-02
CS-137	1.05E-02	1.35E-02	2.17E-02
CU-64	Not Detected	--------	8.64E+01
EU-152	Not Detected	--------	7.38E-02
EU-154	Not Detected	--------	1.53E-01
EU-155	Not Detected	--------	1.17E-01
FE-59	Not Detected	--------	6.02E-02
GD-153	Not Detected	--------	9.75E-02
HG-203	Not Detected	--------	2.47E-02
I-131	Not Detected	--------	2.74E-02
IN-115m	Not Detected	--------	1.07E+02
IR-192	Not Detected	--------	2.28E-02
K-40	1.62E+01	2.20	3.12E-01
LA-140	Not Detected	--------	6.23E-02
MN-54	Not Detected	--------	2.79E-02
MN-56	Not Detected	--------	1.48E+04
MO-99	Not Detected	--------	3.45E-01
NA-22	Not Detected	--------	3.38E-02
NA-24	Not Detected	--------	2.54E-01
NB-95	Not Detected	--------	2.14E-01
ND-147	Not Detected	--------	1.84E-01
NI-57	Not Detected	--------	9.41E-02
BE-07	Not Detected	--------	2.07E-01
RU-103	Not Detected	--------	2.27E-02
RU-106	Not Detected	--------	2.35E-01
SB-122	Not Detected	--------	5.68E-02
SB-124	Not Detected	--------	2.54E-02
SB-125	Not Detected	--------	7.07E-02
SC-46	Not Detected	--------	4.24E-02
SR-85	Not Detected	--------	3.16E-02
TA-182	Not Detected	--------	1.24E-01
TA-183	Not Detected	--------	5.22E-01
TE-132	Not Detected	--------	3.53E-02
TL-201	Not Detected	--------	2.12E-01
V-48	Not Detected	--------	3.18E-02
XE-133	Not Detected	--------	1.95E-01
Y-88	Not Detected	--------	2.27E-02
ZN-65	Not Detected	--------	8.37E-02
ZR-95	Not Detected	--------	5.11E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-12-96 5:25:54 PM *
****
*
* Analyzed by: 4/15/96 Reviewed by: 4/15/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60042803

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 4-12-96 5:13:18 PM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:

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Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.27E+04
TH-234	Not Detected	--------	4.84E+03
RA-226	Not Detected	--------	6.39E+03
PB-214	Not Detected	--------	6.41E+02
BI-214	Not Detected	--------	6.16E+02
TH-232	Not Detected	--------	2.06E+03
RA-228	Not Detected	--------	2.81E+03
AC-228	Not Detected	--------	1.65E+03
TH-228	Not Detected	--------	4.58E+04
RA-224	Not Detected	--------	1.08E+03
PB-212	Not Detected	--------	3.54E+03
BI-212	Not Detected	--------	3.23E+04
TL-208	Not Detected	--------	6.64E+03
U-235	Not Detected	--------	1.82E+03
TH-231	Not Detected	--------	1.80E+04
PA-231	Not Detected	--------	1.36E+04
TH-227	Not Detected	--------	2.35E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.21E+03
PB-211	Not Detected	--------	1.18E+04
TL-207	Not Detected	--------	2.18E+05
AM-241	8.88E+04	1.48E+04	4.39E+03
PU-239	Not Detected	--------	3.38E+06
NP-237	Not Detected	--------	2.64E+03
PA-233	Not Detected	--------	5.78E+02
TH-229	Not Detected	--------	2.10E+03

[Summary Report] - Sample ID: 60042803

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-108m	Not Detected	--------	3.37E+02
AG-110m	Not Detected	--------	3.78E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.54E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	2.05E+05	1.24E+05	1.90E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	5.28E+06
CE-141	Not Detected	--------	1.09E+21
CE-144	Not Detected	--------	2.32E+05
CO-56	Not Detected	--------	2.18E+10
CO-57	Not Detected	--------	4.12E+04
CO-58	Not Detected	--------	9.88E+10
CO-60	7.39E+04	9.63E+03	4.99E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	1.79E+03
CS-137	6.66E+04	8.63E+03	5.67E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.18E+03
EU-154	Not Detected	--------	2.32E+03
EU-155	Not Detected	--------	2.34E+03
FE-59	Not Detected	--------	2.51E+16
GD-153	Not Detected	--------	2.42E+05
HG-203	Not Detected	--------	1.84E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.51E+10
K-40	Not Detected	--------	1.48E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.06E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	8.91E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	5.60E+14
RU-103	Not Detected	--------	5.80E+17
RU-106	Not Detected	--------	1.25E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	2.51E+12
SB-125	Not Detected	--------	4.24E+03
SC-46	Not Detected	--------	6.28E+09
SR-85	Not Detected	--------	5.81E+11
TA-182	Not Detected	--------	2.09E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	7.23E+07
ZN-65	Not Detected	--------	2.65E+05
ZR-95	Not Detected	--------	1.34E+12

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 4-12-96 5:29:48 PM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 60042803
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 4-12-96 5:13:18 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.302E-02	3.993E-03	8.880E-02	<	In		>
CS-137 Activity	6.855E-02	2.055E-03	6.664E-02	<			>
CO-60 Activity	7.508E-02	1.573E-03	7.360E-02	<			>

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 4/15/96

RADIOLOGICAL SURVEY FORM

Survey Number: 3-96-0424

Page 1 of 2

Location	Requester/Dept.	Date	Time	Duration
E.R. # 58 UCS	#7585	4-10-96	1530	N/A

Purpose	Request #	RWP #
SAMPLES + GEO-PROBE TRUCK	N/A	N/A

Instrument and Probe Type and Serial Number	Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1 / HP-260 / # 2828	JOHN P. KILBANE	John P Kilbane
BICRON MICRO REM # B228L		
TENNELEC LB-5100		

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. 20 / Isotope UNKNOWN: cpm	Bkg cpm	dpm / 100 cm² (1)	(2) T/R/F	ALPHA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. N/A / Isotope N/A: cpm	Bkg cpm	dpm / 100 cm² (1)	(2) T/R/F	RADIATION SURVEY Bkg .01: mrem/hr (3)	Distance
1	SAMPLES # 028853-01 & # 028854-01	80	80	ND	T					<.02	CONTACT
2	# 028853-02										
3	# 028852-02										
4	# 028850-01 & 028851-01										
5	GEO-PROBE TRUCK - FLOOR										
6	- SEAT										
7	- LEFT FRONT TIRE										
8	- LEFT REAR TIRE										
9	- RIGHT REAR TIRE										
10	- RIGHT FRONT TIRE										
11	- PROBE										
	N A	N A				N A				N A	

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, if other than gamma (i.e. α or β).

Remarks:

Reviewed by:

RPOP-008.A

002

Survey No. 3-96-0424

Radiation Protection Sample Diagnostics (7715) TA-III BLDG 6921
Smear Analysis

Date: 4/11/96
Counting Unit id: 1 (SNL# S674564)
Data file name: C:\LBXL\UNIT1\63007901.XLD
Batch Ended: 4/11/96 8:21
Crosstalk Correction: Applied
ANALYZED BY KILBANE
REVIEWED BY JPK
Batch ID: E.R. #56UCS SAMPLES & TRUCK 4-10-96 (KILBANE)

Alpha activity action level (DPM): 200.00
Beta activity action level (DPM): 1000.00
Certainty level for MDA and flags: 95.00%
High Voltage Setting: 1390
Application Revision: 3
Application Version: Standard

Alpha efficiency log file: pu238ab
Alpha Efficiency: 43.06%
Alpha to Beta Crosstalk: 10.98%
Alpha Background (CPM): 0.25
Alpha Correction Factor: 1.000

Beta efficiency log file: cl36ab
Beta Efficiency: 54.11%
Beta into Alpha Crosstalk: 0.85%
Beta Background (CPM): 2.65
Beta Correction Factor: 1.000

	Alpha Activity				Beta Activity				count	Alpha	Beta	Time
ID	DPM	σ	flags	MDA	DPM	σ	flags	MDA	Time	CPM	CPM	Complt
1	1.84	2.75	<MDA	11.76	9.81	5.33	<AL	15.40	1.00	0.75	5.35	8:09
2	-0.73	2.72	<MDA	11.49	6.31	4.62	<AL	15.18	1.00	-0.25	3.35	8:11
3	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	8:12
4	-0.73	2.72	<MDA	11.49	6.31	4.62	<AL	15.18	1.00	-0.25	3.35	8:13
5	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	8:14
6	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	8:15
7	-0.68	2.69	<MDA	11.19	2.58	3.79	<MDA	15.18	1.00	-0.25	1.35	8:16
8	-0.71	2.71	<MDA	11.34	4.44	4.23	<MDA	15.18	1.00	-0.25	2.35	8:17
9	-0.59	2.65	<MDA	10.51	-4.89	1.99	<MDA	15.19	1.00	-0.25	-2.65	8:19
10	1.95	2.68	<MDA	11.01	0.48	3.30	<MDA	15.41	1.00	0.75	0.35	8:20
11	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	8:21

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab Batch No. 609927

PAGE 1 OF 1

AR/COC- 05089

SF 2001-COC (6-95)

Dept. No./Mail Stop: 7585/MS 1148
Project/Task Manager: Mike Young
Project Name: Foothills Test Area
Record Center Code: E12/1332/58/DAT
Logbook Ref No: 0155
Service Order No.: CF0180

Date Samples Shipped: 4-12-96
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: CCF
SMO Contact/Phone: Doug Salmi/848-0963
Send Report to SMO Deborah McLaughlin

Contract No.: NA
Case No.: 3122.400
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

GAMMA SPEC

Location Tech Area III
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	GAMMA SPEC	Lab Sample ID
02883559-03	58UCS-6R-011-4.7-SS	4.7	58	4/11/96 1030	Soil	Poly	500ml	4°	C	SA	X	
02883599-03	58UCS-6R-020-4.7-SS	4.7	58	4/11/96 1500	Soil	Poly	500ml	4°	C	SA	X	

RMMA ☒ Yes ☐ No Ref. No. _____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush Required Report Date 4/19/96

Sample Tracking
Date Entered (mm/dd/yy) 4/16/96
Entered by: AMC
QC Inits. _____

Special Instructions/QC Requirements
- This is an RMMA
- This coc # 05089 will release coc# 05087 to GEL
- SEND REPORT TO MIKE YOUNG

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Concetta Cacciato	Concetta Cacciato	CC	Lamb/7584/284-3301
	Rod Nagel	R. Nagel	RN	IT/7584

1. Relinquished by	Concetta Cacciato	Org. 7584	Date 4/12/96	Time 1000	4. Relinquished by	Org.	Date	Time
1. Received by	[illegible]	Org. 7513	Date 4/12/96	Time 1000	4. Received by	Org.	Date	Time
2. Relinquished by	[illegible]	Org. 7513	Date 4/12/96	Time 1025	5. Relinquished by	Org.	Date	Time
2. Received by	[illegible]	Org. 7713	Date 4/12/96	Time 1025	5. Received by	Org.	Date	Time
3. Relinquished by	[illegible]	Org. SMO 7713	Date 4/15/96	Time 0840	6. Relinquished by	Org.	Date	Time
3. Received by	[illegible]	Org. SMO 7513	Date 4/11/96	Time 0840	6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics 58 LCS

Sample Analysis Request Form
Page 1 **of** 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer : Mike Young
Organization: 7585
Project Location: Foothills Test Area
Phone: 284-2595
Date Results Needed:
Suspect Isotopes:
Other Information: COC# 05087

Hazards/Special Instructions:
NEED 24 HOUR
TURN AROUND

Batch Log Number: 600429
Logged By: SMS

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
028855-03	Soil	4/11/96 1030	500ml	Gamma Spec.	01	<300	666	
028859-03	Soil	4/11/96 1500	500ml	Gamma Spec.	02	<300	417	
LCS		1Nov90		"	03	NA	NA	

Relinquished by		Date 4/12/96	Time 1025	Received by S.B. Sbarra	Date 4/12/96	Time 1025
Relinquished by		Date 4/15/96	Time 0840	Received by	Date 4/15/96	Time 0840
Relinquished by		Date	Time	Received by	Date	Time
Relinquished by		Date	Time	Received by	Date	Time

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-12-96 11:20:19 AM *
****
*
* Analyzed by: 4/15/96 Reviewed by: 4/15/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 028855-03
Lab Sample ID : 60042901

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 666.000 gram
Sample Date/Time : 4-11-96 10:30:00 AM
Acquire Start Date : 4-12-96 9:36:45 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6003 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	3.61
TH-234	1.15	3.85E-01	5.69E-01
RA-226	Not Detected	--------	8.08E-01
PB-214	5.12E-01	8.75E-02	5.67E-02
BI-214	5.26E-01	9.67E-02	7.76E-02
TH-232	7.85E-01	3.73E-01	1.94E-01
RA-228	8.98E-01	3.29E-01	1.63E-01
AC-228	8.63E-01	1.65E-01	1.09E-01
TH-228	5.89E-01	2.24E-01	4.60E-01
RA-224	7.43E-01	1.95E-01	8.56E-02
PB-212	8.27E-01	1.40E-01	3.92E-02
BI-212	1.09	3.26E-01	4.00E-01
TL-208	7.61E-01	1.27E-01	7.95E-02
U-235	Not Detected	--------	2.33E-01
TH-231	Not Detected	--------	2.72
PA-231	Not Detected	--------	1.48
TH-227	Not Detected	--------	3.76E-01
RA-223	Not Detected	--------	1.87E-01
RN-219	Not Detected	--------	4.00E-01
PB-211	Not Detected	--------	9.35E-01
TL-207	Not Detected	--------	1.40E+01
AM-241	Not Detected	--------	5.98E-01
PU-239	Not Detected	--------	4.56E+02
NP-237	Not Detected	--------	2.61E-01
PA-233	Not Detected	--------	5.96E-02
TH-229	Not Detected	--------	2.88E-01

[Summary Report] - Sample ID: 60042901

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	4.13E-02
AG-110m	Not Detected	--------	3.30E-02
AR-41	Not Detected	--------	3.66E+02
BA-133	Not Detected	--------	5.79E-02
BA-140	Not Detected	--------	1.11E-01
CD-109	Not Detected	--------	8.99E-01
CD-115	Not Detected	--------	8.99E-02
CE-139	Not Detected	--------	3.04E-02
CE-141	Not Detected	--------	5.41E-02
CE-144	Not Detected	--------	2.42E-01
CO-56	Not Detected	--------	3.49E-02
CO-57	Not Detected	--------	3.19E-02
CO-58	Not Detected	--------	3.19E-02
CO-60	Not Detected	--------	3.73E-02
CR-51	Not Detected	--------	2.39E-01
CS-134	Not Detected	--------	4.88E-02
CS-137	Not Detected	--------	3.76E-02
CU-64	Not Detected	--------	2.80E+01
EU-152	Not Detected	--------	8.79E-02
EU-154	Not Detected	--------	1.89E-01
EU-155	Not Detected	--------	1.40E-01
FE-59	Not Detected	--------	7.51E-02
GD-153	Not Detected	--------	1.14E-01
HG-203	Not Detected	--------	2.95E-02
I-131	Not Detected	--------	3.04E-02
IN-115m	Not Detected	--------	2.69
IR-192	Not Detected	--------	2.87E-02
K-40	1.96E+01	2.67	3.06E-01
LA-140	Not Detected	--------	5.24E-02
MN-54	Not Detected	--------	3.54E-02
MN-56	Not Detected	--------	2.16E+01
MO-99	Not Detected	--------	3.40E-01
NA-22	Not Detected	--------	4.35E-02
NA-24	Not Detected	--------	1.05E-01
NB-95	Not Detected	--------	2.11E-01
ND-147	Not Detected	--------	2.14E-01
NI-57	Not Detected	--------	7.48E-02
BE-07	Not Detected	--------	2.44E-01
RU-103	Not Detected	--------	2.79E-02
RU-106	Not Detected	--------	2.87E-01
SB-122	Not Detected	--------	5.37E-02
SB-124	Not Detected	--------	3.24E-02
SB-125	Not Detected	--------	8.42E-02
SC-46	Not Detected	--------	5.14E-02
SR-85	Not Detected	--------	3.83E-02
TA-182	Not Detected	--------	1.51E-01
TA-183	Not Detected	--------	5.89E-01
TE-132	Not Detected	--------	3.35E-02
TL-201	Not Detected	--------	2.08E-01
V-48	Not Detected	--------	3.75E-02
XE-133	Not Detected	--------	1.69E-01
Y-88	Not Detected	--------	2.64E-02
ZN-65	Not Detected	--------	9.95E-02
ZR-95	Not Detected	--------	5.86E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-12-96 1:09:18 PM *
****
*
* Analyzed by: 4/15/96 Reviewed by: 4/15/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : 028859-03
Lab Sample ID : 60042902

Sample Description : MARINELLI SOLID SAMPLE
Sample Type : Solid
Sample Geometry : 2SMAR
Sample Quantity : 417.000 gram
Sample Date/Time : 4-11-96 3:00:00 PM
Acquire Start Date : 4-12-96 11:26:14 AM
Detector Name : LAB02
Elapsed Live Time : 6000 seconds
Elapsed Real Time : 6002 seconds

Comments:

****

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	--------	4.14
TH-234	Not Detected	--------	9.85E-01
RA-226	1.78	8.84E-01	1.32
PB-214	5.85E-01	1.22E-01	1.23E-01
BI-214	5.06E-01	9.73E-02	7.48E-02
TH-232	7.16E-01	4.09E-01	4.02E-01
RA-228	9.19E-01	3.07E-01	1.72E-01
AC-228	Not Detected	--------	2.62E-01
TH-228	Not Detected	--------	1.07
RA-224	8.65E-01	2.35E-01	9.75E-02
PB-212	7.96E-01	1.56E-01	5.18E-02
BI-212	9.38E-01	3.72E-01	4.95E-01
TL-208	6.95E-01	1.57E-01	1.70E-01
~~U-235~~	~~1.55E-01~~	~~2.37E-01~~	3.09E-01 Not detected 4/15/96
TH-231	Not Detected	--------	3.36
PA-231	Not Detected	--------	1.91
TH-227	Not Detected	--------	4.75E-01
RA-223	Not Detected	--------	2.37E-01
RN-219	Not Detected	--------	4.93E-01
PB-211	Not Detected	--------	1.13
TL-207	Not Detected	--------	1.87E+01
AM-241	Not Detected	--------	6.90E-01
PU-239	Not Detected	--------	5.82E+02
NP-237	Not Detected	--------	4.82E-01
PA-233	Not Detected	--------	8.08E-02
TH-229	Not Detected	--------	3.62E-01

[Summary Report] - Sample ID: 60042902

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-108m	Not Detected	--------	5.45E-02
AG-110m	Not Detected	--------	4.10E-02
AR-41	Not Detected	--------	1.65E+02
BA-133	Not Detected	--------	7.69E-02
BA-140	Not Detected	--------	1.48E-01
CD-109	Not Detected	--------	1.63
CD-115	Not Detected	--------	1.15E-01
CE-139	Not Detected	--------	3.83E-02
CE-141	Not Detected	--------	7.06E-02
CE-144	Not Detected	--------	3.12E-01
CO-56	Not Detected	--------	5.11E-02
CO-57	Not Detected	--------	4.14E-02
CO-58	Not Detected	--------	4.22E-02
CO-60	Not Detected	--------	4.85E-02
CR-51	Not Detected	--------	3.22E-01
CS-134	Not Detected	--------	6.45E-02
CS-137	Not Detected	--------	4.70E-02
CU-64	Not Detected	--------	3.29E+01
EU-152	Not Detected	--------	1.17E-01
EU-154	Not Detected	--------	2.45E-01
EU-155	Not Detected	--------	1.81E-01
FE-59	Not Detected	--------	9.84E-02
GD-153	Not Detected	--------	1.45E-01
HG-203	Not Detected	--------	3.90E-02
I-131	Not Detected	--------	4.10E-02
IN-115m	Not Detected	--------	2.34
IR-192	Not Detected	--------	3.86E-02
K-40	1.77E+01	2.49	5.06E-01
LA-140	Not Detected	--------	6.87E-02
MN-54	Not Detected	--------	4.84E-02
MN-56	Not Detected	--------	1.54E+01
MO-99	Not Detected	--------	4.14E-01
NA-22	Not Detected	--------	5.87E-02
NA-24	Not Detected	--------	1.25E-01
NB-95	Not Detected	--------	2.60E-01
ND-147	Not Detected	--------	2.72E-01
NI-57	Not Detected	--------	8.90E-02
BE-07	Not Detected	--------	3.26E-01
RU-103	Not Detected	--------	3.58E-02
RU-106	Not Detected	--------	4.07E-01
SB-122	Not Detected	--------	7.28E-02
SB-124	Not Detected	--------	4.45E-02
SB-125	Not Detected	--------	1.17E-01
SC-46	Not Detected	--------	6.85E-02
SR-85	Not Detected	--------	5.38E-02
TA-182	Not Detected	--------	2.02E-01
TA-183	Not Detected	--------	6.65E-01
TE-132	Not Detected	--------	4.52E-02
TL-201	Not Detected	--------	2.48E-01
V-48	Not Detected	--------	4.89E-02
XE-133	Not Detected	--------	2.08E-01
Y-88	Not Detected	--------	3.83E-02
ZN-65	Not Detected	--------	1.33E-01
ZR-95	Not Detected	--------	8.14E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-12-96 1:29:52 PM *
****
*
* Analyzed by: 4/15/96 Reviewed by: 4/15/96 *
****

Customer : M.YOUNG/D.BISWELL (7585/SMO)
Customer Sample ID : LAB CONTROL SAMPLE #CG134
Lab Sample ID : 60042903

Sample Description : MIXED_GAMMA_STANDARD
Sample Type : Liquid
Sample Geometry : WMAR
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date : 4-12-96 1:17:13 PM
Detector Name : LAB02
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Comments:

****

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	--------	2.26E+04
TH-234	Not Detected	--------	4.90E+03
RA-226	Not Detected	--------	6.37E+03
PB-214	Not Detected	--------	6.45E+02
BI-214	Not Detected	--------	6.14E+02
TH-232	Not Detected	--------	2.03E+03
RA-228	Not Detected	--------	2.92E+03
AC-228	Not Detected	--------	1.63E+03
TH-228	Not Detected	--------	4.66E+04
RA-224	Not Detected	--------	1.40E+03
PB-212	Not Detected	--------	3.51E+03
BI-212	Not Detected	--------	3.39E+04
TL-208	Not Detected	--------	6.56E+03
U-235	Not Detected	--------	1.78E+03
TH-231	Not Detected	--------	1.74E+04
PA-231	Not Detected	--------	1.39E+04
TH-227	Not Detected	--------	2.32E+03
RA-223	Not Detected	--------	1.00E+26
RN-219	Not Detected	--------	5.24E+03
PB-211	Not Detected	--------	1.18E+04
TL-207	Not Detected	--------	2.16E+05
AM-241	9.64E+04	1.64E+04	6.37E+03
PU-239	Not Detected	--------	3.40E+06
NP-237	Not Detected	--------	2.60E+03
PA-233	Not Detected	--------	5.92E+02
TH-229	Not Detected	--------	2.14E+03

[Summary Report] - Sample ID: 60042903

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-108m	Not Detected	--------	3.54E+02
AG-110m	Not Detected	--------	3.81E+05
AR-41	Not Detected	--------	1.00E+26
BA-133	Not Detected	--------	5.53E+02
BA-140	Not Detected	--------	1.00E+26
CD-109	3.22E+05	1.25E+05	1.75E+05
CD-115	Not Detected	--------	1.00E+26
CE-139	Not Detected	--------	5.22E+06
CE-141	Not Detected	--------	1.06E+21
CE-144	Not Detected	--------	2.34E+05
CO-56	Not Detected	--------	2.18E+10
CO-57	Not Detected	--------	4.04E+04
CO-58	Not Detected	--------	9.91E+10
CO-60	7.52E+04	9.79E+03	5.52E+02
CR-51	Not Detected	--------	1.00E+26
CS-134	Not Detected	--------	1.81E+03
CS-137	6.75E+04	8.73E+03	4.41E+02
CU-64	Not Detected	--------	1.00E+26
EU-152	Not Detected	--------	1.15E+03
EU-154	Not Detected	--------	2.41E+03
EU-155	Not Detected	--------	2.29E+03
FE-59	Not Detected	--------	2.46E+16
GD-153	Not Detected	--------	2.46E+05
HG-203	Not Detected	--------	1.83E+15
I-131	Not Detected	--------	1.00E+26
IN-115m	Not Detected	--------	1.00E+26
IR-192	Not Detected	--------	3.45E+10
K-40	Not Detected	--------	1.65E+03
LA-140	Not Detected	--------	1.00E+26
MN-54	Not Detected	--------	3.04E+04
MN-56	Not Detected	--------	1.00E+26
MO-99	Not Detected	--------	1.00E+26
NA-22	Not Detected	--------	9.03E+02
NA-24	Not Detected	--------	1.00E+26
NB-95	Not Detected	--------	1.00E+26
ND-147	Not Detected	--------	1.00E+26
NI-57	Not Detected	--------	1.00E+26
BE-07	Not Detected	--------	5.59E+14
RU-103	Not Detected	--------	5.90E+17
RU-106	Not Detected	--------	1.22E+05
SB-122	Not Detected	--------	1.00E+26
SB-124	Not Detected	--------	2.56E+12
SB-125	Not Detected	--------	4.21E+03
SC-46	Not Detected	--------	6.29E+09
SR-85	Not Detected	--------	5.85E+11
TA-182	Not Detected	--------	2.08E+08
TA-183	Not Detected	--------	1.00E+26
TE-132	Not Detected	--------	1.00E+26
TL-201	Not Detected	--------	1.00E+26
V-48	Not Detected	--------	1.00E+26
XE-133	Not Detected	--------	1.00E+26
Y-88	Not Detected	--------	7.47E+07
ZN-65	Not Detected	--------	2.70E+05
ZR-95	Not Detected	--------	1.31E+12

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 4-12-96 1:34:49 PM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 60042903
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 4-12-96 1:17:13 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	9.301E-02	3.995E-03	9.639E-02	<		In	>
CS-137 Activity	6.855E-02	2.057E-03	6.748E-02	<			>
CO-60 Activity	7.508E-02	1.574E-03	7.439E-02	<			>

ok 4/15/96

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 4/15/96

Survey Number: 3-96-0428

RADIOLOGICAL SURVEY FORM

Location	Requisition/Dept.	Date	Time	Duration
E.R. #58UCS	#7587	4-11-96	1545	N/A

Purpose	Request #	RWP #
SAMPLES + GEO-PROBE TRUCK	N/A	N/A

Instrument and Probe Type and Serial Number:	Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP-260/#2828	JOHN P. KILBANE	John Kilbane
BICRON MICRO REM# B228L		

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. 20 /Isotope UNKNOWN				ALPHA CONTAMINATION Counting Data Attached ☒Yes ☐No % Eff. N/A /Isotope N/A				RADIATION SURVEY Bkg. .01	
		cpm	Bkg. cpm	dpm/100 cm² (1)	(2) T/R/F	cpm	Bkg. cpm	dpm/100 cm² (1)	(2) T/R/F	mrem/hr (3)	Distance
1	SAMPLES #028852-03	80	80	ND	T					<.02	CONTACT
2	#028855-03										
3	#028859-01 & #028860-01										
4	#028855-02 #028856-01 #028855-01 #028857-01										
5	TRUCK - LEFT FRONT TIRE										
6	-LEFT REAR TIRE							N			
7	-RIGHT FRONT TIRE							A			
8	-RIGHT REAR TIRE										
9	-FLOOR										
10	-SEAT										
11	-PROBE										
		N/A		N/A							N/A

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, if other than gamma (i.e. n or β).

Remarks:

Reviewed by:

Survey No. 3-96-0428

Radiation Protection Sample Diagnostics (7715) TA-III BLDG 6921
Smear Analysis

Date: 4/11/96
Counting Unit id: 1 (SNL# S674564)
Data file name: C:\LBXL\UNIT1\63007906.XLD
Batch Ended: 4/11/96 15:41
Crosstalk Correction: Applied
ANALYZED BY KILBANE
REVIEWED BY JPK

Alpha activity action level (DPM): 200.00
Beta activity action level (DPM): 1000.00
Certainty level for MDA and flags: 95.00%
High Voltage Setting: 1390

Application Revision: 3
Application Version: Standard

Alpha efficiency log file: pu238ab
Alpha Efficiency: 43.06%
Alpha to Beta Crosstalk: 10.98%
Alpha Background (CPM): 0.25
Alpha Correction Factor: 1.000

Beta efficiency log file: cl36ab
Beta Efficiency: 54.11%
Beta into Alpha Crosstalk: 0.85%
Beta Background (CPM): 2.65
Beta Correction Factor: 1.000

Batch ID: E.R. #58UCS SAMPLES & GEOPROBE TRUCK 4-11-96 (KILBANE)

	Alpha Activity				Beta Activity							
ID	DPM	σ	flags	MDA	DPM	σ	flags	MDA	count Time	Alpha CPM	Beta CPM	Time Compl
1	-0.66	2.68	<MDA	11.03	0.71	3.30	<MDA	15.18	1.00	-0.25	0.35	15:29
2	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	15:31
3	-0.62	2.65	<MDA	10.69	-3.02	1.99	<MDA	15.19	1.00	-0.25	-1.65	15:32
4	-0.62	2.65	<MDA	10.69	-3.02	1.99	<MDA	15.19	1.00	-0.25	-1.65	15:33
5	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	15:34
6	-0.64	2.66	<MDA	10.86	-1.16	2.73	<MDA	15.19	1.00	-0.25	-0.65	15:35
7	-0.73	2.72	<MDA	11.49	6.31	4.62	<AL	15.18	1.00	-0.25	3.35	15:36
8	1.93	2.69	<MDA	11.17	2.35	3.79	<MDA	15.41	1.00	0.75	1.35	15:38
9	1.91	2.71	<MDA	11.32	4.21	4.23	<MDA	15.41	1.00	0.75	2.35	15:39
10	-0.73	2.72	<MDA	11.49	6.31	4.62	<AL	15.18	1.00	-0.25	3.35	15:40
11	-0.73	2.72	<MDA	11.49	6.31	4.62	<AL	15.18	1.00	-0.25	3.35	15:41

ON-SITE LABORATORY (RPSD)
ANALYSIS REQUEST AND CHAIN OF CUSTODY

ternal Lab

atch No 001945 SAR/WR No

AR/COC 603801

ept No /Mail Stop	6134	Date Samples Shipped	10-17-00 SMO USE	Logged By	
oject/Task Manager	C Byrd/M Mignardot	Carrier/Waybill No	HC	Project/Task No	7213 02 02 06
roject Name	Site 58/UCS	Lab Contact	R Reese 505 844 7683	SMO Authorization	
ecord Center Code		Lab Destination	RPSD	Location N/A	Tech Area N/A
ogbook Ref No	062, 072	SMO Contact/Phone	D Salmi 505 844 3110	Building N/A	Room N/A
ervice Order No	CF0000-01				

10/19/00

☐ Characterization Only
☐ Waste Characterization
-RCRA Date = _____
-Send preliminary/copy report to

☐ Release to ERCL On-Site Lab
☐ Release to Off-Site Lab
-This COC Number Releases
COC No(s): 603800

Sample No -Fraction / RPSD No -Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Analysis Request
054068-003	58UCS-GR-202-0-SS	2 ft	58	101700 1019	S	M	500 ml	None	G	S	Gamm Spec (901.1)
01				1019							
054073-003	58UCS-GR-207-0-SS	4 ft	58	101700 1025	S	M	500 ml	None	G	S	Gamm Spec (901.1)
02				6459							
LCS											
03											

RMMA ☐ Yes ☑ No Ref No

Sample Disposal ☑ Return to Client ☐ Disposal by Lab

Turnaround Time ~~☑ Normal~~ ☑ Rush

Required Report Date

Sample Tracking Smo Use

Date Entered(mm/dd/yy) 10/19/00

Entered by SAC

QC inits

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Raw Data Package ☑ Yes ☐ No

*Heads Up: More samples to follow.

*Please send report to: Radiological SMO Review MWC 10/19/00

emigna@sandia.gov

Please list as separate report.

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cellular
	M Sanchez			Weston/6135/845-3267
	W Gibson		10/19	MDM/6135/845-3267

1 Relinquished by		Org 6135	Date 10/17/00	Time 1755	4 Relinquished by		Org 6133	Date 10/19/00	Time 1025
1 Received by		Org 6135	Date 10/17/00	Time 1755	4 Received by		Org 6133	Date 10/19/00	Time 1025
2 Relinquished by		Org 6133	Date 10/17/00	Time 1520	5 Relinquished by		Org	Date	Time
2 Received by		Org 7132	Date 10/17/00	Time 1520	5 Received by		Org	Date	Time
3 Relinquished by		Org 7132	Date 10/18/00	Time 0820	6 Relinquished by		Org	Date	Time
3 Received by		Org 6133	Date 10/18/00	Time 0820	6 Received by		Org	Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/17/00 5:35:01 PM

Analyzed by: 10/18/00 Reviewed by: JPK 10-18-00

Customer : BYRD/PERRY(6134)
Customer Sample ID : 054068-003
Lab Sample ID : 00194501

Sample Description : 58UCS-GR-202-0-SS
Sample Quantity : 709.000 gram
Sample Date/Time : 10/17/00 10:19:00 AM
Acquire Start Date/Time : 10/17/00 3:54:48 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.36E-001
RA-226	1.51E+000	5.57E-001	7.86E-001
PB-214	6.33E-001	1.02E-001	6.84E-002
BI-214	5.78E-001	9.70E-002	5.53E-002
PB-210	Not Detected	---	3.34E+001
TH-232	8.96E-001	4.14E-001	1.75E-001
RA-228	8.21E-001	2.97E-001	1.33E-001
AC-228	8.75E-001	1.63E-001	1.02E-001
TH-228	8.20E-001	3.48E-001	4.88E-001
RA-224	1.01E+000	2.17E-001	5.33E-002
PB-212	9.02E-001	1.33E-001	3.44E-002
BI-212	1.08E+000	3.17E-001	3.81E-001
TL-208	8.53E-001	1.39E-001	8.36E-002
U-235	Not Detected	---	2.13E-001
TH-231	Not Detected	---	1.19E+001
PA-231	Not Detected	---	1.25E+000
TH-227	Not Detected	---	3.61E-001
RA-223	Not Detected	---	1.85E-001
RN-219	Not Detected	---	3.27E-001
PB-211	Not Detected	---	7.58E-001
TL-207	Not Detected	---	1.18E+001
AM-241	Not Detected	---	4.92E-001
PU-239	Not Detected	---	3.99E+002
NP-237	Not Detected	---	2.15E+000
PA-233	Not Detected	---	5.17E-002
TH-229	Not Detected	---	2.28E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 00194501

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.49E-002
AG-110m	Not Detected	---------	2.63E-002
BA-133	Not Detected	---------	4.29E-002
BE-7	Not Detected	---------	2.11E-001
CD-115	Not Detected	---------	6.72E-002
CE-139	Not Detected	---------	2.53E-002
CE-141	Not Detected	---------	4.59E-002
CE-144	Not Detected	---------	2.09E-001
CO-56	Not Detected	---------	2.95E-002
CO-57	Not Detected	---------	2.80E-002
CO-58	Not Detected	---------	2.72E-002
CO-60	Not Detected	---------	3.38E-002
CR-51	Not Detected	---------	2.00E-001
CS-134	Not Detected	---------	3.81E-002
CS-137	Not Detected	---------	2.93E-002
EU-152	Not Detected	---------	8.39E-002
EU-154	Not Detected	---------	1.68E-001
EU-155	Not Detected	---------	1.32E-001
FE-59	Not Detected	---------	6.15E-002
GD-153	Not Detected	---------	9.74E-002
HG-203	Not Detected	---------	2.75E-002
I-131	Not Detected	---------	2.48E-002
IR-192	Not Detected	---------	2.36E-002
K-40	1.78E+001	2.40E+000	2.95E-001
MN-52	Not Detected	---------	2.67E-002
MN-54	Not Detected	---------	1.75E-002
MO-99	Not Detected	---------	2.19E-001
NA-22	Not Detected	---------	3.64E-002
NA-24	Not Detected	---------	4.14E-002
NB-95	~~3.78E-002~~	~~1.09E-002~~	6.64E-002 NOT DETECTED KAT 10/18/00
ND-147	Not Detected	---------	1.62E-001
NI-57	Not Detected	---------	3.12E-002
RU-103	Not Detected	---------	2.44E-002
RU-106	Not Detected	---------	2.57E-001
SB-122	Not Detected	---------	3.81E-002
SB-124	Not Detected	---------	2.69E-002
SB-125	Not Detected	---------	6.95E-002
SN-113	Not Detected	---------	3.28E-002
SR-85	Not Detected	---------	3.42E-002
TA-182	Not Detected	---------	1.36E-001
TA-183	Not Detected	---------	4.34E-001
TL-201	Not Detected	---------	1.75E-001
XE-133	Not Detected	---------	1.44E-001
Y-88	Not Detected	---------	2.20E-002
ZN-65	Not Detected	---------	8.94E-002
ZR-95	Not Detected	---------	5.01E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/17/00 7:16:56 PM

Analyzed by: Reviewed by: JPK 10-18-00

Customer : BYRD/PERRY(6134)
Customer Sample ID : 054073-003
Lab Sample ID : 00194502

Sample Description : 58UCS-GR-207-0-SS
Sample Quantity : 645.000 gram
Sample Date/Time : 10/17/00 10:25:00 AM
Acquire Start Date/Time : 10/17/00 5:36:43 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.62E-001
RA-226	1.24E+000	5.35E-001	7.80E-001
PB-214	5.67E-001	9.09E-002	5.58E-002
BI-214	5.71E-001	9.55E-002	4.97E-002
PB-210	Not Detected	---	3.49E+001
TH-232	1.23E+000	5.67E-001	2.28E-001
RA-228	8.82E-001	3.22E-001	1.29E-001
AC-228	8.66E-001	1.59E-001	8.40E-002
TH-228	7.19E-001	5.03E-001	7.77E-001
RA-224	1.03E+000	2.25E-001	6.22E-002
PB-212	9.43E-001	1.71E-001	3.78E-002
BI-212	9.97E-001	3.62E-001	4.84E-001
TL-208	8.68E-001	1.39E-001	7.01E-002
U-235	Not Detected	---	2.22E-001
TH-231	Not Detected	---	1.24E+001
PA-231	Not Detected	---	1.32E+000
TH-227	Not Detected	---	3.84E-001
RA-223	Not Detected	---	1.98E-001
RN-219	Not Detected	---	3.69E-001
PB-211	Not Detected	---	8.39E-001
TL-207	Not Detected	---	1.28E+001
AM-241	Not Detected	---	5.19E-001
PU-239	Not Detected	---	4.10E+002
NP-237	Not Detected	---	2.36E+000
PA-233	Not Detected	---	5.39E-002
TH-229	Not Detected	---	2.40E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 00194502

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.56E-002
AG-110m	Not Detected	---	4.38E-002
BA-133	Not Detected	---	4.57E-002
BE-7	Not Detected	---	2.29E-001
CD-115	Not Detected	---	7.29E-002
CE-139	Not Detected	---	2.57E-002
CE-141	Not Detected	---	4.82E-002
CE-144	Not Detected	---	2.24E-001
CO-56	Not Detected	---	2.96E-002
CO-57	Not Detected	---	2.88E-002
CO-58	Not Detected	---	3.09E-002
CO-60	Not Detected	---	3.22E-002
CR-51	Not Detected	---	2.20E-001
CS-134	Not Detected	---	4.01E-002
CS-137	1.65E-001	3.11E-002	2.49E-002
EU-152	Not Detected	---	8.73E-002
EU-154	Not Detected	---	1.73E-001
EU-155	Not Detected	---	1.83E-001
FE-59	Not Detected	---	6.35E-002
GD-153	Not Detected	---	1.03E-001
HG-203	Not Detected	---	3.00E-002
I-131	Not Detected	---	2.65E-002
IR-192	Not Detected	---	2.56E-002
K-40	1.87E+001	2.52E+000	3.15E-001
MN-52	Not Detected	---	2.81E-002
MN-54	Not Detected	---	1.58E-002
MO-99	Not Detected	---	2.40E-001
NA-22	Not Detected	---	3.86E-002
NA-24	Not Detected	---	4.60E-002
NB-95	Not Detected	---	1.78E-001
ND-147	Not Detected	---	1.92E-001
NI-57	Not Detected	---	2.74E-002
RU-103	Not Detected	---	2.69E-002
RU-106	Not Detected	---	2.50E-001
SB-122	Not Detected	---	4.26E-002
SB-124	Not Detected	---	2.75E-002
SB-125	Not Detected	---	7.85E-002
SN-113	Not Detected	---	3.52E-002
SR-85	Not Detected	---	3.57E-002
TA-182	Not Detected	---	1.35E-001
TA-183	Not Detected	---	4.62E-001
TL-201	Not Detected	---	1.90E-001
XE-133	Not Detected	---	1.52E-001
Y-88	Not Detected	---	2.19E-002
ZN-65	Not Detected	---	9.33E-002
ZR-95	Not Detected	---	5.28E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/18/00 7:24:21 AM

Analyzed by: [signature] 10/18/00 Reviewed by: JPK 10-18-00

ıstomer : BYRD/PERRY(6134)
ıstomer Sample ID : LAB CONTROL SAMPLE USING CG134
ıb Sample ID : 00194503

ımple Description : MIXED_GAMMA_STANDARD_CG134
ımple Quantity : 1.000 Each
ımple Date/Time : 11/01/90 12:00:00 PM
:quire Start Date/Time : 10/18/00 7:14:07 AM
:tector Name : LAB02
lapsed Live/Real Time : 600 / 605 seconds

ɔmments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	4.29E+003
RA-226	Not Detected	---------	5.67E+003
PB-214	Not Detected	---------	6.10E+002
BI-214	Not Detected	---------	5.33E+002
PB-210	Not Detected	---------	2.53E+005
TH-232	Not Detected	---------	1.96E+003
RA-228	Not Detected	---------	2.11E+003
AC-228	Not Detected	---------	1.29E+003
TH-228	Not Detected	---------	2.27E+005
RA-224	Not Detected	---------	7.03E+003
PB-212	Not Detected	---------	1.71E+004
BI-212	Not Detected	---------	1.29E+005
TL-208	Not Detected	---------	3.03E+004
U-235	Not Detected	---------	1.58E+003
TH-231	Not Detected	---------	7.41E+004
PA-231	Not Detected	---------	1.32E+004
TH-227	Not Detected	---------	2.52E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	5.69E+003
PB-211	Not Detected	---------	1.27E+004
TL-207	Not Detected	---------	1.97E+005
AM-241	8.42E+004	1.35E+004	6.81E+003
PU-239	Not Detected	---------	2.80E+006
NP-237	Not Detected	---------	1.51E+004
PA-233	Not Detected	---------	5.61E+002
TH-229	Not Detected	---------	1.59E+003

[Summary Report] - Sample ID: : 00194503

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	2.68E+002
AG-110m	Not Detected	---	3.91E+007
BA-133	Not Detected	---	7.46E+002
BE-7	Not Detected	---	1.00E+026
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	1.84E+010
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	1.08E+007
CO-56	Not Detected	---	4.92E+016
CO-57	Not Detected	---	2.25E+006
CO-58	Not Detected	---	7.86E+017
CO-60	8.53E+004	1.11E+004	6.12E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	7.17E+003
CS-137	7.56E+004	9.77E+003	5.66E+002
EU-152	Not Detected	---	1.06E+003
EU-154	Not Detected	---	2.61E+003
EU-155	Not Detected	---	3.98E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	2.26E+007
HG-203	Not Detected	---	1.00E+026
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	1.77E+017
K-40	Not Detected	---	1.28E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	9.70E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	2.43E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	2.41E+006
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	3.93E+020
SB-125	Not Detected	---	1.25E+004
SN-113	Not Detected	---	1.34E+012
SR-85	Not Detected	---	2.64E+019
TA-182	Not Detected	---	3.12E+012
TA-183	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	2.50E+012
ZN-65	Not Detected	---	2.11E+007
ZR-95	Not Detected	---	5.74E+019

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report

eport Date : 10/18/00 7:24:23 AM
A File : C:\GENIE2K\CAMFILES\LCS2.QAF
nalyst : KICHAVE
ample ID : 00194503
ample Quantity : 1.00 Each
ample Date : 11/01/90 12:00:00 PM
easurement Date : 10/18/00 7:14:07 AM
lapsed Live Time : 600 seconds
lapsed Real Time : 605 seconds

arameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
M-241 Activity	8.206E-002	3.524E-003	8.419E-002	<	:	:	: >
S-137 Activity	7.157E-002	2.554E-003	7.563E-002	<	:	:	: >
O-60 Activity	7.977E-002	2.877E-003	8.461E-002	<	:	:	: >

lags Key: LU = Boundary Test (Ab = Abcve , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Actien)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Actien)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

eviewed by: _____ 10/18/00

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report

Report Date : 10/18/00 7:24:23 AM
QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst : KICHAVE
Sample ID : 00194503
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 10/18/00 7:14:07 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.206E-002	3.524E-003	8.419E-002	<			>
CS-137 Activity	7.157E-002	2.554E-003	7.563E-002	<			>
CO-60 Activity	7.977E-002	2.877E-003	8.461E-002	<			>

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 10/18/00

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. 001915 SAR/WR No. AR/COC 603799

Dept. No./Mail Stop:	6134	Date Samples Shipped:	10-11-00 SMO USE	Logged By:	☐ Characterization Only
Project/Task Manager:	C Byrd/M Mignardot	Carrier/Waybill No.	HC	Project/Task No.:7213.02.02.06	☐ Waste Characterization
Project Name:	Site 58/UCS	Lab Contact:	R Reese 505-844-7683	SMO Authorization:	-RCRA Date =
Record Center Code:		Lab Destination:	RPSD	Location: N/A Tech Area: N/A	-Send preliminary/copy report to:
Logbook Ref. No.:	062, 072	SMO Contact/Phone:	D Salmi 505-844-3110	Building: N/A Room: N/A	☐ Release to ERCL On-Site Lab
Service Order No.:	CF 0090-01				☑ Release to Off-Site Lab
					-This COC Number Releases COC No(s).: 603798

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Analysis Request
054067-003	58UCS-GR-201-0-SS	2 ft	58	101100 1018	S	M	500 ml	None	G	S	Gamm Spec (901.1) Lab 3
01			810.6 g								
054072-003	58UCS-GR-206-0-SS	4 ft	58	101100 1047	S	M	500 ml	None	G	S	Gamm Spec (901.1) Lab 4
02			888.7 g								
LCS											Lab 3
03											
LCS											Lab 4
04											

RMMA	☐ Yes ☑ No	Ref. No.	
Sample Disposal	☑ Return to Client	☐ Disposal by Lab	
Turnaround Time	☐ Normal	☒ Rush	
	Required Report Date		QC inits.

Sample Tracking — Smo Use
Date Entered(mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Raw Data Package ☑ Yes ☐ No

*Send report to:
emigna@sandia.gov

*Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	M Sanchez	Margaret Sanchez	MS	Weston/6135/845-3267
	W Gibson	William Gibson	WG	MDM/6135/845-3267

1.Relinquished by	Margaret Sanchez	Org. 6135	Date 10/11/00	Time 1520	4.Relinquished by		Org.	Date	Time
1. Received by		Org. 6133	Date 10/11/00	Time 1520	4. Received by		Org.	Date	Time
2.Relinquished by		Org. 6133	Date 10/11/00	Time 1540	5.Relinquished by		Org.	Date	Time
2. Received by		Org. 7132	Date 10-11-00	Time 1540	5. Received by		Org.	Date	Time
3.Relinquished by		Org. 7132	Date 10-12-00	Time 0904	6.Relinquished by		Org.	Date	Time
3. Received by		Org. 6133	Date 10-12-00	Time 0904	6. Received by		Org.	Date	Time

Survey #: _____

Page _____ of _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/12/00 6:33:11 AM

Analyzed by: 10/12/00 Reviewed by: 10/12/00

Customer : C. BYRD/D. PERRY (6134/SMO)
Customer Sample ID : 054067-003/58UCS-GR-201-0-SS
Lab Sample ID : 00191501

Sample Description : MARINELLI SOIL SAMPLE
Sample Quantity : 810.600 gram
Sample Date/Time : 10/11/00 10:18:00 AM
Acquire Start Date/Time : 10/11/00 3:59:51 PM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6002 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.21E-001
RA-226	7.80E-001	3.40E-001	4.92E-001
PB-214	3.87E-001	6.61E-002	4.79E-002
BI-214	3.58E-001	6.82E-002	5.10E-002
PB-210	Not Detected	---	3.05E+000
TH-232	6.80E-001	5.96E-001	1.26E-001
RA-228	6.98E-001	3.07E-001	1.48E-001
AC-228	5.53E-001	1.23E-001	1.06E-001
TH-228	8.71E-001	2.10E-001	4.22E-001
RA-224	7.74E-001	1.83E-001	6.74E-002
PB-212	6.60E-001	1.15E-001	2.88E-002
BI-212	6.61E-001	3.04E-001	4.31E-001
TL-208	5.93E-001	1.08E-001	8.33E-002
U-235	7.40E-002	1.17E-001	1.50E-001
TH-231	Not Detected	---	5.93E+000
PA-231	Not Detected	---	1.06E+000
TH-227	Not Detected	---	3.11E-001
RA-223	Not Detected	---	9.51E-002
RN-219	Not Detected	---	3.10E-001
PB-211	Not Detected	---	7.26E-001
TL-207	Not Detected	---	1.32E+001
AM-241	Not Detected	---	1.23E-001
PU-239	Not Detected	---	2.73E+002
NP-237	Not Detected	---	1.39E+000
PA-233	Not Detected	---	4.71E-002
TH-229	Not Detected	---	1.36E-001

Survey #:_____

Page _____ of _____

Summary Report] - Sample ID: : 00191501

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected		3.73E-002
AG-110m	Not Detected		3.04E-002
BA-133	Not Detected		3.57E-002
BE-7	Not Detected		2.15E-001
CD-115	Not Detected		6.16E-002
CE-139	Not Detected		1.95E-002
CE-141	Not Detected		3.27E-002
CE-144	Not Detected		1.43E-001
CO-56	Not Detected		2.71E-002
CO-57	Not Detected		1.85E-002
CO-58	Not Detected		2.74E-002
CO-60	Not Detected		3.47E-002
CR-51	Not Detected		1.87E-001
CS-134	Not Detected		4.41E-002
CS-137	1.70E-002	1.66E-002	2.63E-002
EU-152	Not Detected		5.53E-002
EU-154	Not Detected		1.70E-001
EU-155	Not Detected		8.59E-002
FE-59	Not Detected		6.50E-002
GD-153	Not Detected		5.55E-002
HG-203	Not Detected		2.51E-002
I-131	Not Detected		2.35E-002
IR-192	Not Detected		2.22E-002
K-40	1.40E+001	1.92E+000	2.73E-001
MN-52	Not Detected		3.03E-002
MN-54	Not Detected		3.22E-002
MO-99	Not Detected		2.36E-001
NA-22	Not Detected		4.06E-002
NA-24	Not Detected		3.99E-002
NB-95	Not Detected		1.50E-001
ND-147	Not Detected		1.73E-001
NI-57	Not Detected		4.84E-002
RU-103	Not Detected		2.32E-002
RU-106	Not Detected		2.47E-001
SB-122	Not Detected		3.66E-002
SB-124	Not Detected		2.87E-002
SB-125	Not Detected		7.05E-002
SN-113	Not Detected		3.07E-002
SR-85	Not Detected		2.98E-002
TA-182	Not Detected		1.27E-001
TA-183	Not Detected		1.08E-001
TL-201	Not Detected		7.24E-002
XE-133	Not Detected		6.90E-002
Y-88	Not Detected		2.32E-002
ZN-65	Not Detected		8.68E-002
ZR-95	Not Detected		5.20E-002

Survey #: _____

Page _____ of _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/12/00 6:28:30 AM

Analyzed by: UJ 10/12/00 Reviewed by: 10/12/00

Customer : C. BYRD/D. PERRY (6134/SMO)
Customer Sample ID : 054072-003/58UCS-GR-206-0-SS
Lab Sample ID : 00191502

Sample Description : MARINELLI SOIL SAMPLE
Sample Quantity : 888.700 gram
Sample Date/Time : 10/11/00 10:47:00 AM
Acquire Start Date/Time : 10/11/00 3:46:47 PM
Detector Name : LAB04
Elapsed Live/Real Time : 6000 / 6003 seconds

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.88E-001	5.50E-001	3.50E-001
RA-226	1.02E+000	3.88E-001	5.55E-001
PB-214	4.25E-001	6.98E-002	5.11E-002
BI-214	4.28E-001	7.34E-002	4.83E-002
PB-210	Not Detected	---	6.49E+000
TH-232	6.52E-001	3.03E-001	1.39E-001
RA-228	6.98E-001	1.43E-001	8.99E-002
AC-228	6.22E-001	1.16E-001	7.08E-002
TH-228	7.58E-001	1.95E-001	3.24E-001
RA-224	6.87E-001	1.52E-001	5.20E-002
PB-212	6.45E-001	1.12E-001	2.61E-002
BI-212	7.00E-001	2.41E-001	3.17E-001
TL-208	5.48E-001	9.19E-002	6.02E-002
U-235	Not Detected	---	1.49E-001
TH-231	Not Detected	---	6.92E+000
PA-231	Not Detected	---	9.82E-001
TH-227	Not Detected	---	2.59E-001
RA-223	Not Detected	---	1.17E-001
RN-219	Not Detected	---	2.52E-001
PB-211	Not Detected	---	5.78E-001
TL-207	Not Detected	---	1.00E+001
AM-241	Not Detected	---	1.68E-001
PU-239	Not Detected	---	2.70E+002
NP-237	Not Detected	---	1.51E+000
PA-233	Not Detected	---	4.12E-002
TH-229	Not Detected	---	1.56E-001

Survey #:_____

Page _____ of _____

[Summary Report] - Sample ID: : 00191502

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected		2.94E-002
AG-110m	Not Detected		2.58E-002
BA-133	Not Detected		4.29E-002
BE-7	Not Detected		1.62E-001
CD-115	Not Detected		5.18E-002
CE-139	Not Detected		1.91E-002
CE-141	Not Detected		3.24E-002
CE-144	Not Detected		1.45E-001
CO-56	Not Detected		2.21E-002
CO-57	Not Detected		1.91E-002
CO-58	Not Detected		2.28E-002
CO-60	Not Detected		2.54E-002
CR-51	Not Detected		1.65E-001
CS-134	Not Detected		3.31E-002
CS-137	3.76E-002	1.86E-002	2.74E-002
EU-152	Not Detected		5.75E-002
EU-154	Not Detected		1.35E-001
EU-155	Not Detected		8.99E-002
FE-59	Not Detected		5.05E-002
GD-153	Not Detected		6.49E-002
HG-203	Not Detected		2.18E-002
I-131	Not Detected		1.99E-002
IR-192	Not Detected		1.91E-002
K-40	1.56E+001	2.09E+000	2.34E-001
MN-52	Not Detected		2.10E-002
MN-54	Not Detected		2.35E-002
MO-99	Not Detected		1.83E-001
NA-22	Not Detected		3.03E-002
NA-24	Not Detected		2.93E-002
NB-95	Not Detected		1.24E-001
ND-147	Not Detected		1.46E-001
NI-57	Not Detected		3.64E-002
RU-103	Not Detected		2.06E-002
RU-106	Not Detected		2.09E-001
SB-122	Not Detected		2.87E-002
SB-124	Not Detected		2.03E-002
SB-125	Not Detected		5.67E-002
SN-113	Not Detected		2.62E-002
SR-85	Not Detected		2.61E-002
TA-182	Not Detected		1.03E-001
TA-183	Not Detected		1.46E-001
TL-201	Not Detected		9.04E-002
XE-133	Not Detected		8.90E-002
Y-88	Not Detected		1.68E-002
ZN-65	Not Detected		7.02E-002
ZR-95	Not Detected		4.06E-002

ON-SITE LABORATORY (RPSD)
ANALYSIS REQUEST AND CHAIN OF CUSTODY

"RELEASING COC"

Internal Lab

Batch No. OD 1955 SAR/WR No. AR/COC 603803

Dept. No./Mail Stop:	6134	Date Samples Shipped: 10-18-00 SMO USE	Logged By:		☐ Characterization Only
Project/Task Manager:	C Byrd/M Mignardot	Carrier/Waybill No. HC	Project/Task No.:	7213.02.02.06	☐ Waste Characterization
Project Name:	Site 58/UCS	Lab Contact: R Reese 505-844-7683	SMO Authorization:		-RCRA Date =
Record Center Code:		Lab Destination: RPSD	Location: N/A	Tech Area: N/A	-Send preliminary/copy report to:
Logbook Ref. No.:	062, 072	SMO Contact/Phone: D Salmi 505-844-3110	Building: N/A	Room: N/A	☐ Release to ERCL On-Site Lab
Service Order No.:	CF 0900-01				☐ Release to Off-Site Lab
					-This COC Number Releases COC No(s).: 603802

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Analysis Request
054069-003	58UCS-GR-203-0-SS	4' 6"	58	101800 0943	S	M	500 ml	None	G	S	LAB 03
01				7419							Gamm Spec (901.1)
LAB C.S.											
02											

RMMA	☐ Yes ☑ No	Ref. No.	
Sample Disposal	☑ Return to Client	☐ Disposal by Lab	
Turnaround Time	☑ Normal	☒ Rush	
Required Report Date			QC inits.

Sample Tracking	Smo Use
Date Entered(mm/dd/yy)	
Entered by:	

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Raw Data Package ☑ Yes ☐ No
*Heads Up: More samples to follow.
*Please send report to:
emigna@sandia.gov
Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	M Sanchez	Margaret Sanchez	MS	Weston/6135/845-3267
	W Gibson			MDM/6135/845-3267

1.Relinquished by	Margaret Sanchez	Org. 6135	Date 10/18/00	Time 1025	4.Relinquished by		Org.	Date	Time
1. Received by	[illegible] SMO	Org. 6132	Date 10/18/00	Time 1025	4. Received by		Org.	Date	Time
2.Relinquished by	[illegible] SMO	Org. 6132	Date 10/18/00	Time 1135	5.Relinquished by		Org.	Date	Time
2. Received by	[illegible]	Org. 7132	Date 10-18-00	Time 1135	5. Received by		Org.	Date	Time
3.Relinquished by	[illegible]	Org. 7132	Date 10-1800	Time 1427	6.Relinquished by		Org.	Date	Time
3. Received by	[illegible] SMO	Org. 6132	Date 10-18-00	Time 1427	6. Received by		Org.	Date	Time

Survey #:_____

Page _____ of _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/18/00 2:11:14 PM

Analyzed by: 10/18/00 Reviewed by: APK 10-18-00

ıstomer : BYRD/PERRY(6134)
ıstomer Sample ID : 054069-003
ab Sample ID : 00195501

ample Description : 58UCS-GR-203-0-SS
ample Quantity : 741.000 gram
ample Date/Time : 10/18/00 9:43:00 AM
cquire Start Date/Time : 10/18/00 12:31:02 PM
etector Name : LAB03
Lapsed Live/Real Time : 6000 / 6003 seconds

omments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
J-238	Not Detected	---	4.03E-001
RA-226	1.57E+000	5.55E-001	7.77E-001
PB-214	5.30E-001	8.95E-002	6.87E-002
BI-214	5.32E-001	9.33E-002	5.76E-002
PB-210	Not Detected	---	3.82E+000
TH-232	7.70E-001	3.71E-001	2.20E-001
RA-228	8.12E-001	3.56E-001	1.63E-001
AC-228	7.02E-001	1.59E-001	1.49E-001
TH-228	7.05E-001	3.52E-001	5.11E-001
RA-224	8.52E-001	2.01E-001	7.04E-002
PB-212	8.43E-001	1.52E-001	3.58E-002
BI-212	8.52E-001	3.32E-001	4.46E-001
TL-208	7.87E-001	1.42E-001	1.14E-001
U-235	2.55E-001	1.42E-001	1.83E-001
TH-231	Not Detected	---	7.19E+000
PA-231	Not Detected	---	1.26E+000
TH-227	Not Detected	---	3.67E-001
RA-223	Not Detected	---	1.16E-001
RN-219	Not Detected	---	3.60E-001
PB-211	Not Detected	---	8.51E-001
TL-207	Not Detected	---	1.55E+001
AM-241	Not Detected	---	1.45E-001
PU-239	Not Detected	---	3.29E+002
NP-237	Not Detected	---	1.72E+000
PA-233	Not Detected	---	5.44E-002
TH-229	Not Detected	---	1.64E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

Survey #:_____

Page _____ of _____

[Summary Report] - Sample ID: : 00195501

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.42E-002
AG-110m	Not Detected	---------	3.39E-002
BA-133	Not Detected	---------	4.34E-002
BE-7	Not Detected	---------	2.41E-001
CD-115	Not Detected	---------	7.13E-002
CE-139	Not Detected	---------	2.42E-002
CE-141	Not Detected	---------	3.94E-002
CE-144	Not Detected	---------	1.76E-001
CO-56	Not Detected	---------	2.94E-002
CO-57	Not Detected	---------	2.14E-002
CO-58	Not Detected	---------	3.36E-002
CO-60	Not Detected	---------	3.89E-002
CR-51	Not Detected	---------	2.18E-001
CS-134	Not Detected	---------	5.47E-002
CS-137	Not Detected	---------	3.58E-002
EU-152	Not Detected	---------	6.51E-002
EU-154	Not Detected	---------	2.03E-001
EU-155	Not Detected	---------	1.02E-001
FE-59	Not Detected	---------	7.66E-002
GD-153	Not Detected	---------	6.56E-002
HG-203	Not Detected	---------	2.79E-002
I-131	Not Detected	---------	2.93E-002
IR-192	Not Detected	---------	2.58E-002
K-40	1.69E+001	2.32E+000	3.39E-001
MN-52	Not Detected	---------	3.28E-002
MN-54	Not Detected	---------	3.68E-002
MO-99	Not Detected	---------	2.69E-001
NA-22	Not Detected	---------	4.39E-002
NA-24	Not Detected	---------	3.93E-002
NB-95	Not Detected	---------	1.74E-001
ND-147	Not Detected	---------	1.90E-001
NI-57	Not Detected	---------	5.48E-002
RU-103	Not Detected	---------	2.72E-002
RU-106	Not Detected	---------	2.91E-001
SB-122	Not Detected	---------	4.40E-002
SB-124	Not Detected	---------	3.34E-002
SB-125	Not Detected	---------	8.40E-002
SN-113	Not Detected	---------	3.59E-002
SR-85	Not Detected	---------	3.39E-002
TA-182	Not Detected	---------	1.57E-001
TA-183	Not Detected	---------	1.24E-001
TL-201	Not Detected	---------	8.72E-002
XE-133	Not Detected	---------	8.03E-002
Y-88	Not Detected	---------	2.91E-002
ZN-65	Not Detected	---------	1.06E-001
ZR-95	Not Detected	---------	6.35E-002

Survey #: _____

Page _____ of _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/18/00 2:28:29 PM

Analyzed by: 10/18/00 Reviewed by: JPK 10-18-00

Customer : BYRD/PERRY(6134)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 00195502

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 10/18/00 2:18:16 PM
Detector Name : LAB03
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	2.63E+003
RA-226	Not Detected	---------	5.63E+003
PB-214	Not Detected	---------	7.22E+002
BI-214	Not Detected	---------	6.34E+002
PB-210	Not Detected	---------	4.75E+004
TH-232	Not Detected	---------	2.26E+003
RA-228	Not Detected	---------	2.72E+003
AC-228	Not Detected	---------	1.64E+003
TH-228	Not Detected	---------	2.54E+005
RA-224	Not Detected	---------	9.58E+003
PB-212	Not Detected	---------	1.72E+004
BI-212	Not Detected	---------	1.64E+005
TL-208	Not Detected	---------	3.57E+004
U-235	Not Detected	---------	1.34E+003
TH-231	Not Detected	---------	3.97E+004
PA-231	Not Detected	---------	1.34E+004
TH-227	Not Detected	---------	2.47E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	6.61E+003
PB-211	Not Detected	---------	1.49E+004
TL-207	Not Detected	---------	2.45E+005
AM-241	8.98E+004	1.28E+004	2.53E+003
PU-239	Not Detected	---------	2.24E+006
NP-237	Not Detected	---------	1.18E+004
PA-233	Not Detected	---------	6.24E+002
TH-229	Not Detected	---------	1.11E+003

Survey #:_____

Page _____ of _____

[Summary Report] - Sample ID: : 00195502

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.46E+002
AG-110m	Not Detected	---	4.50E+007
BA-133	Not Detected	---	8.66E+002
BE-7	Not Detected	---	1.00E+026
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	1.70E+010
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	8.96E+006
CO-56	Not Detected	---	5.88E+016
CO-57	Not Detected	---	1.72E+006
CO-58	Not Detected	---	9.26E+017
CO-60	8.03E+004	1.05E+004	9.67E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	8.80E+003
CS-137	7.02E+004	9.03E+003	4.95E+002
EU-152	Not Detected	---	8.03E+002
EU-154	Not Detected	---	3.36E+003
EU-155	Not Detected	---	2.98E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	1.54E+007
HG-203	Not Detected	---	1.00E+026
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	2.01E+017
K-40	Not Detected	---	1.51E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	1.18E+006
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	2.75E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	2.87E+006
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	4.93E+020
SB-125	Not Detected	---	1.48E+004
SN-113	Not Detected	---	1.53E+012
SR-85	Not Detected	---	3.05E+019
TA-182	Not Detected	---	3.79E+012
TA-183	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	2.79E+012
ZN-65	Not Detected	---	2.62E+007
ZR-95	Not Detected	---	6.62E+019

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 10/18/00 2:28:31 PM
QA File : C:\GENIE2K\CAMFILES\LCS3.QAF
Analyst : JKILBA
Sample ID : 00195502
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 10/18/00 2:18:16 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.692E-002	1.755E-003	8.979E-002	<	:	:	: >
CS-137 Activity	6.979E-002	1.756E-003	7.018E-002	<	:	:	: >
CO-60 Activity	7.964E-002	1.684E-003	7.962E-002	<	:	:	: >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 10/18/00

ON-SITE LABORATORY (RPSD)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

COPY

Internal Lab

Page 1 of 1

Batch No. # 001982 SAR/WR No.

AR/COC 603805

Dept. No./Mail Stop:	6134	Date Samples Shipped:	SMO USE	Logged By:	
Project/Task Manager:	C Byrd/M Mignardot	Carrier/Waybill No.		Project/Task No.:	7213.02.02.06
Project Name:	Site 58/UCS	Lab Contact:	R Reese 505-844-7683	SMO Authorization:	
Record Center Code:		Lab Destination:	RPSD	Location: N/A	Tech Area: N/A
Logbook Ref. No.:	062, 072	SMO Contact/Phone:	D Salmi 505-844-3110	Building: N/A	Room: N/A
Service Order No.:	~~CF-0908-01~~ CF0090-01				

☐ Characterization Only
☐ Waste Characterization
-RCRA Date = _____
-Send preliminary/copy report to:

☐ Release to ERCL On-Site Lab
☐ Release to Off-Site Lab
-This COC Number Releases
COC No(s).: 603804

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Analysis Request
054074-003	58UCS-GR-208-0-SS		58	102000 1037	S	M	500 ml	None	G	S	
01				7659							Gamma Spec (901.1)
LCS											
02											

RMMA	☐ Yes ☑ No	Ref. No.	
Sample Disposal	☑ Return to Client	☒ Disposal by Lab	
Turnaround Time	☑ Normal	☒ Rush	
	Required Report Date		QC inits.

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Raw Data Package ☑ Yes ☐ No

*Heads Up: More samples to follow.
*Please send report to:
emigna@sandia.gov

Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	M Sanchez	Margaret Sanchez	MS	Weston/6135/845-3267
	W Gibson	William J Gibson	WJG	MDM/6135/845-3267

1.Relinquished by	Margaret Sanchez		Org. 6135	Date 10-23-00	Time 1020	4.Relinquished by		Org.	Date	Time
1. Received by		SMO	Org. 7135	Date 10/23/00	Time 1020	4. Received by		Org.	Date	Time
2.Relinquished by		SMO	Org. 7135	Date 10/23/00	Time 1050	5.Relinquished by		Org.	Date	Time
2. Received by			Org. 7132	Date 10-23-00	Time 1050	5. Received by		Org.	Date	Time
3.Relinquished by			Org. 7132	Date 10-23-00	Time 1555	6.Relinquished by		Org.	Date	Time
3. Received by		SMO	Org. 7135	Date 102300	Time 1555	6. Received by		Org.	Date	Time

****

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

10/23/00 12:49:26 PM

****

Analyzed by: K 10/23/00 Reviewed by: JPK 10-23-00

****

Customer : BYRD/RIVERA(6134)
Customer Sample ID : 054074-003
Lab Sample ID : 00198201

Sample Description : 58UCS-GR-208-0-SS
Sample Quantity : 765.000 gram
Sample Date/Time : 10/20/00 10:37:00 AM
Acquire Start Date/Time : 10/23/00 11:09:13 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.93E-001
RA-226	1.26E+000	4.43E-001	6.13E-001
PB-214	5.83E-001	9.31E-002	6.06E-002
BI-214	5.67E-001	9.89E-002	6.35E-002
PB-210	Not Detected	---	3.66E+000
TH-232	8.90E-001	4.20E-001	2.22E-001
RA-228	7.87E-001	6.32E-001	1.72E-001
AC-228	7.21E-001	1.59E-001	1.44E-001
TH-228	Not Detected	---	6.78E-001
RA-224	8.55E-001	2.03E-001	8.83E-002
PB-212	7.93E-001	1.41E-001	3.37E-002
BI-212	8.40E-001	3.12E-001	4.10E-001
TL-208	7.72E-001	1.32E-001	8.69E-002
U-235	Not Detected	---	1.79E-001
TH-231	Not Detected	---	7.07E+000
PA-231	Not Detected	---	1.26E+000
TH-227	Not Detected	---	3.56E-001
RA-223	Not Detected	---	1.33E-001
RN-219	Not Detected	---	3.69E-001
PB-211	Not Detected	---	8.31E-001
TL-207	Not Detected	---	1.47E+001
AM-241	Not Detected	---	1.43E-001
PU-239	Not Detected	---	3.20E+002
NP-237	Not Detected	---	1.61E+000
PA-233	Not Detected	---	5.44E-002
TH-229	Not Detected	---	1.62E-001

[Summary Report] - Sample ID: : 00198201

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.03E-002
AG-110m	Not Detected	---	3.06E-002
BA-133	Not Detected	---	4.33E-002
BE-7	Not Detected	---	2.44E-001
CD-115	Not Detected	---	1.70E-001
CE-139	Not Detected	---	2.41E-002
CE-141	Not Detected	---	4.18E-002
CE-144	Not Detected	---	1.74E-001
CO-56	Not Detected	---	3.10E-002
CO-57	Not Detected	---	2.23E-002
CO-58	Not Detected	---	3.37E-002
CO-60	Not Detected	---	3.73E-002
CR-51	Not Detected	---	2.32E-001
CS-134	Not Detected	---	5.39E-002
CS-137	Not Detected	---	3.41E-002
EU-152	Not Detected	---	6.70E-002
EU-154	Not Detected	---	1.86E-001
EU-155	Not Detected	---	9.81E-002
FE-59	Not Detected	---	8.21E-002
GD-153	Not Detected	---	6.53E-002
HG-203	Not Detected	---	2.89E-002
I-131	Not Detected	---	3.54E-002
IR-192	Not Detected	---	2.63E-002
K-40	1.64E+001	2.25E+000	3.23E-001
MN-52	Not Detected	---	4.45E-002
MN-54	Not Detected	---	3.74E-002
MO-99	Not Detected	---	5.40E-001
NA-22	Not Detected	---	4.83E-002
NA-24	Not Detected	---	9.93E-001
NB-95	Not Detected	---	2.94E-001
ND-147	Not Detected	---	2.31E-001
NI-57	Not Detected	---	2.01E-001
RU-103	Not Detected	---	2.86E-002
RU-106	Not Detected	---	2.97E-001
SB-122	Not Detected	---	8.60E-002
SB-124	Not Detected	---	3.27E-002
SB-125	Not Detected	---	8.12E-002
SN-113	Not Detected	---	3.66E-002
SR-85	Not Detected	---	3.51E-002
TA-182	Not Detected	---	1.56E-001
TA-183	Not Detected	---	1.83E-001
TL-201	Not Detected	---	1.61E-001
XE-133	Not Detected	---	2.02E-001
Y-88	Not Detected	---	2.58E-002
ZN-65	Not Detected	---	1.08E-001
ZR-95	Not Detected	---	6.03E-002

Memo

To: File

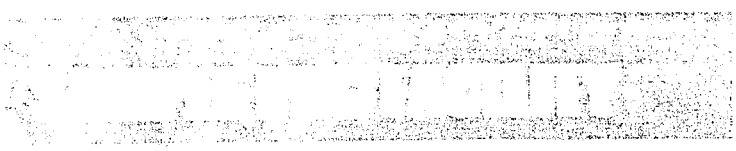
CC: NA

From: Robert P. Rivera Dept. 7135

Date: 10/24/00

Re: COC 603804

I am releasing the samples on COC 603804 for off-site laboratory analysis based upon results of gamma spectroscopic analysis performed on samples under COC 603805. COC 603805 was analyzed in order to determine if any radioactive content above background levels was present. That analysis was reviewed by Mike Enghauser, Dept. 7135, Certified Health Physicist, who determined that the detected activity was within the range of Sandia National Laboratories established background concentrations. The samples on COC 603804 are therefore being managed as non-radioactive in accordance with applicable Sandia National Laboratories, DOE and DOT, policies and procedures.



ON-SITE LABORATORY (RPSD)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

AR/COC 603807

Batch No. 002014 SAR/WR No.

Dept. No./Mail Stop:	6134	Date Samples Shipped:	HC	SMO USE	Logged By:
Project/Task Manager:	C Byrd/M Mignardot	Carrier/Waybill No.	HC		Project/Task No.: 7213.02.02.06
Project Name:	Site 58/UCS	Lab Contact:	R Reese 505-844-7683		SMO Authorization:
Record Center Code:		Lab Destination:	RPSD		Location: N/A Tech Area: N/A
Logbook Ref. No.:	062, 072	SMO Contact/Phone:	D Salmi 505-844-3110		Building: N/A Room: N/A
Service Order No.:	CF 0090-01				

- ☐ Characterization Only
- ☐ Waste Characterization
  - -RCRA Date = _____
  - -Send preliminary/copy report to:
- ☐ Release to ERCL On-Site Lab
- ☐ Release to Off-Site Lab
  - -This COC Number Releases
  - COC No(s).: 603806

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Analysis Request
054070-003	58UCS-GR-204-0-SS	4.5 ft	58	102500 1016	S	M	500 ml	None	G	S	Gamma Spec (901.1)
01			703.14								
LCS											
02											

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☑ Return to Client ☐ Disposal by Lab

Turnaround Time ☐ Normal ☑ Rush

Required Report Date

Sample Tracking Smo Use

Date Entered(mm/dd/yy)

Entered by:

QC inits.

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Raw Data Package ☑ Yes ☐ No

*Heads Up: More samples to follow.

*Please send report to:

emigna@sandia.gov

Please list as separate report.

Sample Team Members

Name	Signature	Init	Company/Organization/Phone/Cellular
M Sanchez	Margaret Sanchez	MD	Weston/6135/845-3267
~~W Gibson~~			~~MDM/6135/845-3267~~

1.Relinquished by	Margaret Sanchez	Org.	6135	Date	102500	Time	1245	4.Relinquished by	Org. Date Time
1. Received by		SMO	Org.	7135	Date	102500	Time	1245	4. Received by	Org. Date Time
2.Relinquished by		SMO	Org.	7135	Date	102600	Time	0948	5.Relinquished by	Org. Date Time
2. Received by			Org.	7132	Date	10-26-00	Time	0948	5. Received by	Org. Date Time
3.Relinquished by			Org.	7132	Date	10-30-00	Time	0940	6.Relinquished by	Org. Date Time
3. Received by		SMO	Org.	6177	Date	10-30-00	Time	0940	6. Received by	Org. Date Time

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 10/26/00 11:48:04 AM *
****
*
* Analyzed by: LH 10.26.00 Reviewed by: AM 10/26/00 *
****

Customer : C. BYRD /R. RIVERA (6134/SMO)
Customer Sample ID : 054070-003
Lab Sample ID : 00201401

Sample Description : 58UCS-GR-204-0-SS
Sample Quantity : 703.100 gram
Sample Date/Time : 10/25/00 10:16:00 AM
Acquire Start Date/Time : 10/26/00 10:07:50 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.00E-001
RA-226	1.13E+000	5.27E-001	7.81E-001
PB-214	6.31E-001	1.02E-001	7.10E-002
BI-214	5.57E-001	9.84E-002	6.31E-002
PB-210	Not Detected	---	3.89E+000
TH-232	9.22E-001	4.29E-001	1.93E-001
RA-228	7.97E-001	3.46E-001	1.78E-001
AC-228	8.14E-001	1.63E-001	1.14E-001
TH-228	9.44E-001	4.95E-001	7.35E-001
RA-224	1.01E+000	2.31E-001	6.78E-002
PB-212	8.22E-001	1.49E-001	3.72E-002
BI-212	8.50E-001	3.05E-001	3.88E-001
TL-208	7.52E-001	1.36E-001	1.04E-001
U-235	Not Detected	---	1.86E-001
TH-231	Not Detected	---	7.23E+000
PA-231	Not Detected	---	1.26E+000
TH-227	Not Detected	---	3.75E-001
RA-223	Not Detected	---	1.21E-001
RN-219	Not Detected	---	3.92E-001
PB-211	Not Detected	---	8.90E-001
TL-207	Not Detected	---	1.59E+001
AM-241	Not Detected	---	1.49E-001
PU-239	Not Detected	---	3.32E+002
NP-237	Not Detected	---	1.74E+000
PA-233	Not Detected	---	5.80E-002
TH-229	Not Detected	---	1.65E-001

[Summary Report] - Sample ID: : 00201401

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.25E-002
AG-110m	Not Detected	---------	3.44E-002
BA-133	Not Detected	---------	4.70E-002
BE-7	Not Detected	---------	2.60E-001
CD-115	Not Detected	---------	9.47E-002
CE-139	Not Detected	---------	2.47E-002
CE-141	Not Detected	---------	4.11E-002
CE-144	Not Detected	---------	1.80E-001
CO-56	Not Detected	---------	3.46E-002
CO-57	Not Detected	---------	2.27E-002
CO-58	Not Detected	---------	3.62E-002
CO-60	Not Detected	---------	4.13E-002
CR-51	Not Detected	---------	2.39E-001
CS-134	Not Detected	---------	5.84E-002
CS-137	Not Detected	---------	3.71E-002
EU-152	Not Detected	---------	6.82E-002
EU-154	Not Detected	---------	1.96E-001
EU-155	Not Detected	---------	1.04E-001
FE-59	Not Detected	---------	7.97E-002
GD-153	Not Detected	---------	6.73E-002
HG-203	Not Detected	---------	2.89E-002
I-131	Not Detected	---------	3.21E-002
IR-192	Not Detected	---------	2.80E-002
K-40	1.80E+001	2.47E+000	3.27E-001
MN-52	Not Detected	---------	4.16E-002
MN-54	Not Detected	---------	3.78E-002
MO-99	Not Detected	---------	3.35E-001
NA-22	Not Detected	---------	4.65E-002
NA-24	Not Detected	---------	1.13E-001
NB-95	Not Detected	---------	2.08E-001
ND-147	Not Detected	---------	2.09E-001
NI-57	Not Detected	---------	8.41E-002
RU-103	Not Detected	---------	2.86E-002
RU-106	Not Detected	---------	3.19E-001
SB-122	Not Detected	---------	5.73E-002
SB-124	Not Detected	---------	3.50E-002
SB-125	Not Detected	---------	8.51E-002
SN-113	Not Detected	---------	3.89E-002
SR-85	Not Detected	---------	3.53E-002
TA-182	Not Detected	---------	1.63E-001
TA-183	Not Detected	---------	1.45E-001
TL-201	Not Detected	---------	1.07E-001
XE-133	Not Detected	---------	1.08E-001
Y-88	Not Detected	---------	3.23E-002
ZN-65	Not Detected	---------	1.15E-001
ZR-95	Not Detected	---------	6.25E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 10/26/00 12:14:47 PM *
****

* Analyzed by: UH 10-26-00 Reviewed by: AM 10/26/00 *

****

Customer : C. BYRD /R. RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 00201402

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 10/26/00 12:04:33 PM
Detector Name : LAB03
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.62E+003
RA-226	Not Detected	---	5.71E+003
PB-214	Not Detected	---	7.37E+002
BI-214	Not Detected	---	6.56E+002
PB-210	Not Detected	---	4.76E+004
TH-232	Not Detected	---	2.23E+003
RA-228	Not Detected	---	2.68E+003
AC-228	Not Detected	---	1.54E+003
TH-228	Not Detected	---	2.57E+005
RA-224	Not Detected	---	9.66E+003
PB-212	Not Detected	---	1.75E+004
BI-212	Not Detected	---	1.57E+005
TL-208	Not Detected	---	3.65E+004
U-235	Not Detected	---	1.29E+003
TH-231	Not Detected	---	3.88E+004
PA-231	Not Detected	---	1.38E+004
TH-227	Not Detected	---	2.55E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.48E+003
PB-211	Not Detected	---	1.48E+004
TL-207	Not Detected	---	2.45E+005
AM-241	8.87E+004	1.26E+004	2.16E+003
PU-239	Not Detected	---	2.28E+006
NP-237	Not Detected	---	1.20E+004
PA-233	Not Detected	---	6.22E+002
TH-229	Not Detected	---	1.09E+003

[Summary Report] - Sample ID: : 00201402

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.33E+002
AG-110m	Not Detected	---------	4.62E+007
BA-133	Not Detected	---------	8.75E+002
BE-7	Not Detected	---------	1.00E+026
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	1.78E+010
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	8.89E+006
CO-56	Not Detected	---------	6.38E+016
CO-57	Not Detected	---------	1.80E+006
CO-58	Not Detected	---------	1.05E+018
CO-60	8.20E+004	1.07E+004	8.80E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	8.74E+003
CS-137	7.07E+004	9.11E+003	4.93E+002
EU-152	Not Detected	---------	8.27E+002
EU-154	Not Detected	---------	3.23E+003
EU-155	Not Detected	---------	2.98E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	1.51E+007
HG-203	Not Detected	---------	1.00E+026
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	2.16E+017
K-40	Not Detected	---------	1.47E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	1.16E+006
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	3.24E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	2.83E+006
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	5.19E+020
SB-125	Not Detected	---------	1.47E+004
SN-113	Not Detected	---------	1.58E+012
SR-85	Not Detected	---------	3.19E+019
TA-182	Not Detected	---------	4.08E+012
TA-183	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	3.21E+012
ZN-65	Not Detected	---------	2.83E+007
ZR-95	Not Detected	---------	7.87E+019

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
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Report Date : 10/26/00 12:14:49 PM
QA File : C:\GENIE2K\CAMFILES\LCS3.QAF
Analyst : LRHERRE
Sample ID : 00201402
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 10/26/00 12:04:33 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.693E-002	1.755E-003	8.868E-002	<	:	:	: >
CS-137 Activity	6.979E-002	1.753E-003	7.074E-002	<	:	:	: >
CO-60 Activity	7.964E-002	1.680E-003	7.999E-002	<	:	:	: >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: LH 10-26-00

ON-SITE LABORATORY (RPSD)
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. 002040 SAR/WR No. AR/COC 603809

Dept. No./Mail Stop:	6134	Date Samples Shipped	10-30-00 SMO USE	Logged By	
Project/Task Manager:	C Byrd/M Mignardot	Carrier/Waybill No.	HC	Project/Task No.:	7213 02 02 06
Project Name:	Site 58/UCS	Lab Contact:	R Reese 505 844-7683	SMO Authorization	
Record Center Code:		Lab Destination:	RPSD	Location N/A	Tech Area: N/A
Logbook Ref. No.:	062, 072	SMO Contact/Phone	D Salmi 505-844-3110	Building: N/A	Room: N/A
Service Order No.:	CF 0090-01				

☐ Characterization Only
☐ Waste Characterization
-RCRA Date = _____
-Send preliminary/copy report to:

☐ Release to ERCL On-Site Lab
☐ Release to Off-Site Lab
-This COC Number Releases
COC No(s).: 603808

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Analysis Request
054071-003	58UCS-GR-205-0-SS	4.5	58	102700 1036	S	M	500 ml	None	G	S	
01 ✓			714.9 ✓								Gamma Spec (901.1) LAB03
LCS 02											

Analysis Request

RMMA	☐ Yes ☑ No	Ref. No.	
Sample Disposal	☑ Return to Client	☐ Disposal by Lab	
Turnaround Time	☑ Normal	☐ Rush	
	Required Report Date		QC inits.

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Raw Data Package ☑ Yes ☐ No
*Heads Up: More samples to follow.
*Please send report to:
emigna@sandia gov
*Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	M Sanchez	Manuel Sanchez	MS	Weston/6135/845-3267
	W Gibson			MDM/6135/845-3267

1 Relinquished by	Manuel Sanchez	Org 6135	Date 10/30/00	Time 0900	4 Relinquished by	Org	Date	Time
1. Received by	[illegible]	Org 6132	Date 10/30/00	Time 0900	4 Received by	Org	Date	Time
2 Relinquished by	[illegible]	Org 6132	Date 10/30/00	Time 0930	5 Relinquished by	Org	Date	Time
2. Received by	[illegible]	Org 7132	Date 10/30/00	Time 0930	5 Received by	Org	Date	Time
3 Relinquished by	[illegible]	Org 7132	Date 10-30-00	Time 1515	6 Relinquished by	Org	Date	Time
3 Received by	[illegible]	Org 6132	Date 10/30/00	Time 1515	6 Received by	Org	Date	Time

* Per Doug Berry - RUSH.

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/30/00 12:13:19 PM

Analyzed by: 10/30/00 Reviewed by: 10/30/00

Customer : BYRD/PERRY (6134/SMO)
Customer Sample ID : 054071-003
Lab Sample ID : 00204001

Sample Description : 58UCS-GR-205-0-SS
Sample Quantity : 714.900 gram
Sample Date/Time : 10/27/00 10:36:00 AM
Acquire Start Date/Time : 10/30/00 10:00:26 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.77E-001
RA-226	1.29E+000	5.34E-001	7.75E-001
PB-214	5.87E-001	1.03E-001	9.01E-002
BI-214	5.03E-001	9.07E-002	6.09E-002
PB-210	Not Detected	---	3.78E+000
TH-232	8.33E-001	3.93E-001	2.00E-001
RA-228	8.21E-001	5.59E-001	1.74E-001
AC-228	7.15E-001	1.51E-001	1.19E-001
TH-228	4.67E-001	3.51E-001	5.42E-001
RA-224	7.91E-001	1.92E-001	8.15E-002
PB-212	7.71E-001	4.17E-001	3.49E-002
BI-212	9.31E-001	3.22E-001	4.07E-001
TL-208	7.25E-001	1.32E-001	1.03E-001
U-235	Not Detected	---	1.79E-001
TH-231	Not Detected	---	6.67E+000
PA-231	Not Detected	---	1.25E+000
TH-227	Not Detected	---	3.58E-001
RA-223	Not Detected	---	1.28E-001
RN-219	Not Detected	---	3.63E-001
PB-211	Not Detected	---	8.44E-001
TL-207	Not Detected	---	1.40E+001
AM-241	Not Detected	---	1.45E-001
PU-239	Not Detected	---	3.11E+002
NP-237	Not Detected	---	1.66E+000
PA-233	Not Detected	---	5.51E-002
TH-229	Not Detected	---	1.64E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 00204001

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.30E-002
AG-110m	Not Detected	---------	3.13E-002
BA-133	Not Detected	---------	4.30E-002
BE-7	Not Detected	---------	2.42E-001
CD-115	Not Detected	---------	1.68E-001
CE-139	Not Detected	---------	2.32E-002
CE-141	Not Detected	---------	4.07E-002
CE-144	Not Detected	---------	1.68E-001
CO-56	Not Detected	---------	3.20E-002
CO-57	Not Detected	---------	2.16E-002
CO-58	Not Detected	---------	3.18E-002
CO-60	Not Detected	---------	3.83E-002
CR-51	Not Detected	---------	2.43E-001
CS-134	Not Detected	---------	5.49E-002
CS-137	Not Detected	---------	3.42E-002
EU-152	Not Detected	---------	6.45E-002
EU-154	Not Detected	---------	1.97E-001
EU-155	Not Detected	---------	9.96E-002
FE-59	Not Detected	---------	7.60E-002
GD-153	Not Detected	---------	6.74E-002
HG-203	Not Detected	---------	2.90E-002
I-131	Not Detected	---------	3.48E-002
IR-192	Not Detected	---------	2.67E-002
K-40	1.39E+001	1.93E+000	3.16E-001
MN-52	Not Detected	---------	4.88E-002
MN-54	Not Detected	---------	3.67E-002
MO-99	Not Detected	---------	5.20E-001
NA-22	Not Detected	---------	4.59E-002
NA-24	Not Detected	---------	1.00E-000
NB-95	Not Detected	---------	2.93E-001
ND-147	Not Detected	---------	2.31E-001
NI-57	Not Detected	---------	2.05E-001
RU-103	Not Detected	---------	2.87E-002
RU-106	Not Detected	---------	2.90E-001
SB-122	Not Detected	---------	8.37E-002
SB-124	Not Detected	---------	3.56E-002
SB-125	Not Detected	---------	8.22E-002
SN-113	Not Detected	---------	3.48E-002
SR-85	Not Detected	---------	3.52E-002
TA-182	Not Detected	---------	1.50E-001
TA-183	Not Detected	---------	1.85E-001
TL-201	Not Detected	---------	1.56E-001
XE-133	Not Detected	---------	1.88E-001
Y-88	Not Detected	---------	2.68E-002
ZN-65	Not Detected	---------	1.00E-001
ZR-95	Not Detected	---------	5.98E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
10/30/00 12:21:00 PM

Analyzed by: 10/30/00 Reviewed by: 10/30/00

Customer : BYRD/PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 00204002

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 10/30/00 12:10:46 PM
Detector Name : LAB03
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.62E+003
RA-226	Not Detected	---	5.81E+003
PB-214	Not Detected	---	7.23E+002
BI-214	Not Detected	---	6.39E+002
PB-210	Not Detected	---	4.69E+004
TH-232	Not Detected	---	2.32E+003
RA-228	Not Detected	---	2.74E+003
AC-228	Not Detected	---	1.57E+003
TH-228	Not Detected	---	2.55E+005
RA-224	Not Detected	---	1.12E+004
PB-212	Not Detected	---	1.71E+004
BI-212	Not Detected	---	1.55E+005
TL-208	Not Detected	---	3.66E+004
U-235	Not Detected	---	1.34E+003
TH-231	Not Detected	---	3.90E+004
PA-231	Not Detected	---	1.33E+004
TH-227	Not Detected	---	2.38E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.67E+003
PB-211	Not Detected	---	1.49E+004
TL-207	Not Detected	---	2.45E+005
AM-241	8.84E+004	1.27E+004	2.58E+003
PU-239	Not Detected	---	2.22E+006
NP-237	Not Detected	---	1.14E+004
PA-233	Not Detected	---	6.25E+002
TH-229	Not Detected	---	1.10E+003

[Summary Report] - Sample ID: : 00204002

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.18E+002
AG-110m	Not Detected	---------	4.64E+007
BA-133	Not Detected	---------	8.72E+002
BE-7	Not Detected	---------	1.00E+026
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	1.77E+010
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	9.22E+006
CO-56	Not Detected	---------	6.49E+016
CO-57	Not Detected	---------	1.82E+006
CO-58	Not Detected	---------	1.09E+018
CO-60	7.71E+004	1.01E+004	8.05E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	8.53E+003
CS-137	7.01E+004	9.02E+003	5.37E+002
EU-152	Not Detected	---------	8.20E+002
EU-154	Not Detected	---------	3.11E+003
EU-155	Not Detected	---------	2.97E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	1.54E+007
HG-203	Not Detected	---------	1.00E+026
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	2.23E+017
K-40	Not Detected	---------	1.32E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	1.20E+006
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	3.12E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	2.94E+006
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	5.36E+020
SB-125	Not Detected	---------	1.48E+004
SN-113	Not Detected	---------	1.61E+012
SR-85	Not Detected	---------	3.36E+019
TA-182	Not Detected	---------	3.98E+012
TA-183	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	2.87E+012
ZN-65	Not Detected	---------	2.77E+007
ZR-95	Not Detected	---------	7.89E+019

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

Quality Assurance Report

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Report Date : 10/30/00 12:21:03 PM
QA File : C:\GENIE2K\CAMFILES\LCS3.QAF
Analyst : KICHAVE
Sample ID : 00204002
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 10/30/00 12:10:46 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.693E-002	1.764E-003	8.839E-002	<	:	:	: >
CS-137 Activity	6.979E-002	1.752E-003	7.007E-002	<	:	:	: >
CO-60 Activity	7.964E-002	1.677E-003	7.891E-002	<	:	:	: >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____ 10/30/00

ON-SITE LABORATORY (RPSD)
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No 002056 SAR/WR No

AR/COC 603811

Dept. No./Mail Stop:	6134	Date Samples Shipped: 10-31-00 SMO USE	Logged By		☐ Characterization Only
Project/Task Manager:	C Byrd/M Mignardot	Carrier/Waybill No. HC	Project/Task No:	7213.02.02.06	☐ Waste Characterization
Project Name:	Site 58/UCS	Lab Contact: R Reese 505-844-7683	SMO Authorization:		-RCRA Date =
Record Center Code:		Lab Destination: RPSD	Location: N/A	Tech Area: N/A	-Send preliminary/copy report to:
Logbook Ref. No.:	062, 072	SMO Contact/Phone: D Salmi 505-844-3110	Building: N/A	Room: N/A	☐ Release to ERCL On-Site Lab
Service Order No.:	CF 0900-01				☐ Release to Off-Site Lab
					-This COC Number Releases COC No(s).: 603810

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Analysis Request
054075-003	58UCS-GR-209-0-SS	4.5	58	103100 0941	S	M	500 ml	None	G	S	Gamma Spec (901.1) LAB03
01			605.5g								
054076-003	58UCS-GR-210-0-SS	4.5	58	103100 0949	S	M	500 ml	None	G	S	Gamma Spec (901.1) LAB04
02 ✓			688.3g								
LCS 03	(LAB04)										
LCS 04	(LAB03)										

RMMA	☐ Yes ☑ No Ref. No.	**Sample Tracking**	**Smo Use**
Sample Disposal	☑ Return to Client ☐ Disposal by Lab	Date Entered(mm/dd/yy)	
Turnaround Time	☑ ~~Normal~~ ☒ Rush	Entered by:	
	Required Report Date	QC inits.	

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Raw Data Package ☑ Yes ☐ No
*Heads Up: More samples to follow.
*Please send report to:
emigna@sandia gov
Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	M Sanchez	Margaret Sanchez	MS	Weston/6135/845-3267
	W Gibson	William Gibson	WG	MDM/6135/845-3267

1 Relinquished by	Margaret Sanchez	Org 6135	Date 10-31-00	Time 1245	4 Relinquished by	Org	Date	Time
1. Received by	[illegible] Gibson	Org 6132	Date 10-31-00	Time 1245	4 Received by	Org	Date	Time
2 Relinquished by	[illegible] Gibson	Org 6132	Date 10-31-00	Time 1345	5 Relinquished by	Org	Date	Time
2 Received by		Org 7132	Date 10-31-00	Time 1345	5 Received by	Org	Date	Time
3 Relinquished by		Org 7132	Date 10-31-00	Time 1820	6 Relinquished by	Org	Date	Time
3 Received by	[illegible]	Org 6132	Date 10/31/00	Time 1820	6 Received by	Org	Date	Time

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 4

To MIKE ENGH.	From D. PERRY
Co. — WBSTON —	
Dept.	Phone # JUST CALL ME
Fax # 264-2105	Fax # 845-0867

Sandia National I
Radiation Protection Sample Diac
10/31/00 3:41:

Analyzed by: 10/31/00 Reviewed by: JPK 10-31-00

Customer : BYRD/PERRY (6134/SMO)
Customer Sample ID : 054075-003
Lab Sample ID : 00205601 656.5g

Sample Description : 58UCS-GR-209-0-SS
Sample Quantity : 656.500 gram
Sample Date/Time : 10/31/00 9:41:00 AM
Acquire Start Date/Time : 10/31/00 2:01:10 PM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.61E-001	4.01E-001	4.07E-001
RA-226	8.31E-001	5.45E-001	8.43E-001
PB-214	4.60E-001	7.95E-002	5.93E-002
BI-214	3.77E-001	7.34E-002	5.43E-002
PB-210	Not Detected	---	3.50E+000
TH-232	4.49E-001	2.35E-001	1.85E-001
RA-228	5.43E-001	2.73E-001	1.51E-001
AC-228	5.28E-001	1.26E-001	1.14E-001
TH-228	Not Detected	---	6.42E-001
RA-224	5.16E-001	1.54E-001	1.24E-001
PB-212	5.50E-001	1.25E-001	3.52E-002
BI-212	3.48E-001	2.73E-001	4.20E-001
TL-208	5.87E-001	1.18E-001	1.07E-001
U-235	Not Detected	---	1.67E-001
TH-231	Not Detected	---	6.41E+000
PA-231	Not Detected	---	1.24E+000
TH-227	Not Detected	---	3.24E-001
RA-223	Not Detected	---	1.01E-001
RN-219	Not Detected	---	3.59E-001
PB-211	Not Detected	---	8.35E-001
TL-207	Not Detected	---	1.47E+001
AM-241	Not Detected	---	1.35E-001
PU-239	Not Detected	---	3.01E+002
NP-237	Not Detected	---	1.63E+000
PA-233	Not Detected	---	5.32E-002
TH-229	Not Detected	---	1.54E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 00205601

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.15E-002
AG-110m	Not Detected	---	3.68E-002
BA-133	Not Detected	---	4.42E-002
BE-7	Not Detected	---	2.31E-001
CD-115	Not Detected	---	6.33E-002
CE-139	Not Detected	---	2.24E-002
CE-141	Not Detected	---	3.69E-002
CE-144	Not Detected	---	1.65E-001
CO-56	Not Detected	---	3.17E-002
CO-57	Not Detected	---	1.98E-002
CO-58	Not Detected	---	3.09E-002
CO-60	Not Detected	---	3.90E-002
CR-51	Not Detected	---	2.10E-001
CS-134	Not Detected	---	4.99E-002
CS-137	3.84E-002	1.76E-002	2.41E-002
EU-152	Not Detected	---	5.99E-002
EU-154	Not Detected	---	1.91E-001
EU-155	Not Detected	---	9.54E-002
FE-59	Not Detected	---	7.46E-002
GD-153	Not Detected	---	6.26E-002
HG-203	Not Detected	---	2.75E-002
I-131	Not Detected	---	2.79E-002
IR-192	Not Detected	---	2.56E-002
K-40	1.36E+001	1.91E+000	3.22E-001
MN-52	Not Detected	---	3.15E-002
MN-54	Not Detected	---	3.40E-002
MO-99	Not Detected	---	2.52E-001
NA-22	Not Detected	---	4.40E-002
NA-24	Not Detected	---	4.24E-002
NB-95	Not Detected	---	1.55E-001
ND-147	Not Detected	---	1.86E-001
NI-57	Not Detected	---	5.18E-002
RU-103	Not Detected	---	2.56E-002
RU-106	Not Detected	---	2.86E-001
SB-122	Not Detected	---	4.07E-002
SB-124	Not Detected	---	3.17E-002
SB-125	Not Detected	---	8.39E-002
SN-113	Not Detected	---	3.34E-002
SR-85	Not Detected	---	3.47E-002
TA-182	Not Detected	---	1.47E-001
TA-183	Not Detected	---	1.16E-001
TL-201	Not Detected	---	7.70E-002
XE-133	Not Detected	---	7.56E-002
Y-88	Not Detected	---	3.13E-002
ZN-65	Not Detected	---	1.05E-001
ZR-95	Not Detected	---	5.65E-002

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

10/31/00 3:21:48 PM

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Analyzed by: 10/31/00 Reviewed by: JPK 10-31-00

****

Customer : BYRD/BERRY (6134/SMO)
Customer Sample ID : 0540776-003
Lab Sample ID : 00205602

688.3g

Sample Description : 58UCS-GR-210-0-SS
Sample Quantity : 688.300 gram
Sample Date/Time : 10/31/00 9:49:00 AM
Acquire Start Date/Time : 10/31/00 1:41:36 PM
Detector Name : LAB04
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	4.79E-001	3.83E-001	3.93E-001
RA-226	1.15E+000	4.86E-001	7.09E-001
PB-214	5.01E-001	7.86E-002	4.42E-002
BI-214	4.51E-001	7.62E-002	4.01E-002
PB-210	Not Detected	---	7.63E+000
TH-232	5.91E-001	2.78E-001	1.31E-001
RA-228	6.50E-001	2.37E-001	1.19E-001
AC-228	5.96E-001	1.22E-001	9.26E-002
TH-228	5.57E-001	5.31E-001	3.84E-001
RA-224	6.10E-001	1.47E-001	7.58E-002
PB-212	6.48E-001	9.62E-002	3.14E-002
BI-212	7.41E-001	2.38E-001	2.91E-001
TL-208	5.36E-001	9.60E-002	7.17E-002
U-235	Not Detected	---	1.66E-001
TH-231	Not Detected	---	8.06E+000
PA-231	Not Detected	---	1.09E+000
TH-227	Not Detected	---	2.94E-001
RA-223	Not Detected	---	1.34E-001
RN-219	Not Detected	---	3.09E-001
PB-211	Not Detected	---	7.06E-001
TL-207	Not Detected	---	1.15E+001
AM-241	Not Detected	---	1.87E-001
PU-239	Not Detected	---	3.14E+002
NP-237	Not Detected	---	1.67E+000
PA-233	Not Detected	---	4.90E-002
TH-229	Not Detected	---	1.76E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 00205602

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.32E-002
AG-110m	Not Detected	---	2.81E-002
BA-133	Not Detected	---	5.10E-002
BE-7	Not Detected	---	1.85E-001
CD-115	Not Detected	---	5.58E-002
CE-139	Not Detected	---	2.24E-002
CE-141	Not Detected	---	3.62E-002
CE-144	Not Detected	---	1.66E-001
CO-56	Not Detected	---	2.47E-002
CO-57	Not Detected	---	2.14E-002
CO-58	Not Detected	---	2.49E-002
CO-60	Not Detected	---	2.94E-002
CR-51	Not Detected	---	1.92E-001
CS-134	Not Detected	---	3.87E-002
CS-137	3.00E-002	1.35E-002	1.87E-002
EU-152	Not Detected	---	6.45E-002
EU-154	Not Detected	---	1.55E-001
EU-155	Not Detected	---	9.84E-002
FE-59	Not Detected	---	5.70E-002
GD-153	Not Detected	---	7.32E-002
HG-203	Not Detected	---	2.39E-002
I-131	Not Detected	---	2.38E-002
IR-192	Not Detected	---	2.31E-002
K-40	1.27E+001	1.73E+000	2.37E-001
MN-52	Not Detected	---	2.45E-002
MN-54	Not Detected	---	2.74E-002
MO-99	Not Detected	---	2.11E-001
NA-22	Not Detected	---	3.15E-002
NA-24	Not Detected	---	3.08E-002
NB-95	Not Detected	---	1.39E-001
ND-147	Not Detected	---	1.64E-001
NI-57	Not Detected	---	3.94E-002
RU-103	Not Detected	---	2.34E-002
RU-106	Not Detected	---	2.36E-001
SB-122	Not Detected	---	3.44E-002
SB-124	Not Detected	---	2.30E-002
SB-125	Not Detected	---	6.60E-002
SN-113	Not Detected	---	2.98E-002
SR-85	Not Detected	---	2.98E-002
TA-182	Not Detected	---	1.18E-001
TA-183	Not Detected	---	1.63E-001
TL-201	Not Detected	---	9.99E-002
XE-133	Not Detected	---	1.03E-001
Y-88	Not Detected	---	1.97E-002
ZN-65	Not Detected	---	8.15E-002
ZR-95	Not Detected	---	4.47E-002

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

10/31/00 3:36:07 PM

Analyzed by: 10/31/00 Reviewed by: JPC 10-31-00

Customer : BYRD/PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 00205603

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 10/31/00 3:25:54 PM
Detector Name : LAB04
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	3.07E+003
RA-226	Not Detected	---	4.66E+003
PB-214	Not Detected	---	5.95E+002
BI-214	Not Detected	---	4.97E+002
PB-210	Not Detected	---	8.68E+004
TH-232	Not Detected	---	1.90E+003
RA-228	Not Detected	---	2.09E+003
AC-228	Not Detected	---	1.23E+003
TH-228	Not Detected	---	2.08E+005
RA-224	Not Detected	---	5.04E+003
PB-212	Not Detected	---	1.51E+004
BI-212	Not Detected	---	1.27E+005
TL-208	Not Detected	---	2.89E+004
U-235	Not Detected	---	1.23E+003
TH-231	Not Detected	---	4.96E+004
PA-231	Not Detected	---	1.17E+004
TH-227	Not Detected	---	2.18E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	5.38E+003
PB-211	Not Detected	---	1.19E+004
TL-207	Not Detected	---	1.87E+005
AM-241	9.01E+004	1.30E+004	2.96E+003
PU-239	Not Detected	---	2.15E+006
NP-237	Not Detected	---	1.18E+004
PA-233	Not Detected	---	5.26E+002
TH-229	Not Detected	---	1.24E+003

[Summary Report] - Sample ID: : 00205603

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	2.68E+002
AG-110m	Not Detected	---	3.87E+007
BA-133	Not Detected	---	7.24E+002
BE-7	Not Detected	---	1.00E+026
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	1.66E+010
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	8.75E+006
CO-56	Not Detected	---	5.13E+016
CO-57	Not Detected	---	1.77E+006
CO-58	Not Detected	---	8.36E+017
CO-60	8.02E+004	1.04E+004	7.96E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	6.64E+003
CS-137	7.23E+004	9.30E+003	3.24E+002
EU-152	Not Detected	---	8.03E+002
EU-154	Not Detected	---	2.60E+003
EU-155	Not Detected	---	3.08E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	1.78E+007
HG-203	Not Detected	---	1.00E+026
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	1.96E+017
K-40	Not Detected	---	1.25E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	9.30E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	2.33E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	2.28E+006
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	4.23E+020
SB-125	Not Detected	---	1.22E+004
SN-113	Not Detected	---	1.33E+012
SR-85	Not Detected	---	2.96E+019
TA-182	Not Detected	---	3.39E+012
TA-183	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	2.27E+012
ZN-65	Not Detected	---	2.18E+007
ZR-95	Not Detected	---	6.58E+019

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report

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Report Date	: 10/31/00 3:36:09 PM
QA File	: C:\GENIE2K\CAMFILES\LCS4.QAF
Analyst	: KICHAVE
Sample ID	: 00205603
Sample Quantity	: 1.00 Each
Sample Date	: 11/01/90 12:00:00 PM
Measurement Date	: 10/31/00 3:25:54 PM
Elapsed Live Time	: 600 seconds
Elapsed Real Time	: 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.769E-002	1.363E-003	9.010E-002	<			>
CS-137 Activity	7.148E-002	1.466E-003	7.234E-002	<			>
CO-60 Activity	8.000E-002	1.644E-003	8.075E-002	<			>

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____ 10/31/00

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

10/31/00 4:05:58 PM

Analyzed by: KS 10/31/00 Reviewed by: APK 10-31-00

Customer : BYRD/PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 00205604

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 10/31/00 3:55:44 PM
Detector Name : LAB03
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.64E+003
RA-226	Not Detected	---	5.86E+003
PB-214	Not Detected	---	7.19E+002
BI-214	Not Detected	---	6.44E+002
PB-210	Not Detected	---	4.72E+004
TH-232	Not Detected	---	2.21E+003
RA-228	Not Detected	---	2.76E+003
AC-228	Not Detected	---	1.56E+003
TH-228	Not Detected	---	2.53E+005
RA-224	Not Detected	---	9.71E+003
PB-212	Not Detected	---	1.75E+004
BI-212	Not Detected	---	1.59E+005
TL-208	Not Detected	---	3.49E+004
U-235	Not Detected	---	1.34E+003
TH-231	Not Detected	---	3.92E+004
PA-231	Not Detected	---	1.35E+004
TH-227	Not Detected	---	2.55E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.59E+003
PB-211	Not Detected	---	1.51E+004
TL-207	Not Detected	---	2.47E+005
AM-241	8.87E+004	1.27E+004	2.42E+003
PU-239	Not Detected	---	2.20E+006
NP-237	Not Detected	---	1.13E+004
PA-233	Not Detected	---	6.14E+002
TH-229	Not Detected	---	1.07E+003

[Summary Report] - Sample ID: : 00205604

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.19E+002
AG-110m	Not Detected	---------	4.69E+007
BA-133	Not Detected	---------	8.59E+002
BE-7	Not Detected	---------	1.00E+026
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	1.83E+010
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	9.18E+006
CO-56	Not Detected	---------	6.75E+016
CO-57	Not Detected	---------	1.79E+006
CO-58	Not Detected	---------	1.10E+018
CO-60	7.83E+004	1.02E+004	8.73E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	8.88E+003
CS-137	7.11E+004	9.15E+003	5.48E+002
EU-152	Not Detected	---------	8.12E+002
EU-154	Not Detected	---------	3.09E+003
EU-155	Not Detected	---------	2.94E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	1.52E+007
HG-203	Not Detected	---------	1.00E+026
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	2.26E+017
K-40	Not Detected	---------	1.57E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	1.19E+006
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	2.89E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	2.86E+006
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	5.63E+020
SB-125	Not Detected	---------	1.53E+004
SN-113	Not Detected	---------	1.62E+012
SR-85	Not Detected	---------	3.53E+019
TA-182	Not Detected	---------	4.24E+012
TA-183	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	2.81E+012
ZN-65	Not Detected	---------	2.76E+007
ZR-95	Not Detected	---------	8.35E+019

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

Quality Assurance Report

Report Date : 10/31/00 4:06:01 PM
QA File : C:\GENIE2K\CAMFILES\LCS3.QAF
Analyst : KICHAVE
Sample ID : 00205604
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 10/31/00 3:55:44 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.693E-002	1.753E-003	8.872E-002	<	:	:	>
CS-137 Activity	6.979E-002	1.750E-003	7.108E-002	<	:	:	>
CO-60 Activity	7.964E-002	1.676E-003	7.951E-002	<	:	:	>

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 10/31/00

Feature 58E

SF 2001-COC (6-95)

Internal Lab Batch No. 700218

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

AR/COC- 04973

Dept. No./Mail Stop: 7585/1148
Project/Task Manager: Mike Young
Project Name: Site 58 Brand Sampling
Record Center Code: ER/1332/58/DAT
Logbook Ref No: 190
Service Order No.: CF0180

SMO USE
Date Samples Shipped: 2/11/97
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: RPSD Bldg. 881
SMO Contact/Phone: ~~ [illegible] ~~
Send Report to SMO: Mike Young 284-2595

Contract No.: N/A
Case No.: 3622.400
SMO Authorization: —
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location Tech Area N/A
Building N/A Room N/A

Reference LOV (available at SMO)

Parameter & Method Requested: Gamma Spec.

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec.										Lab Sample ID
030764-02	SEM-GS-306-0-6	0-1	58	2-11-97 0916	Soil	M	500ml	None	GR	SA	X										
-																					
-																					
-																					
-																					
-																					
-																					
-																					
-																					
-																					

LAB USE

RMMA ☐ Yes ☒ No Ref. No. ______

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date ______

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ______
Entered by: ______
QC inits. ______

Special Instructions/QC Requirements
Send results to Mike Young @ Fax #284-2617.

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members

Name	Signature	Init	Company/Organization/Phone
N. Crapton	[signature]	NC	IT/6654 284-3307

	Org.	Date	Time		Org.	Date	Time
1. Relinquished by [signature]	6684/IT	2-11-97	1310	4. Relinquished by			
1. Received by [signature]	SUL 7578	2/11/97	1310	4. Received by			
2. Relinquished by				5. Relinquished by			
2. Received by				5. Received by			
3. Relinquished by				6. Relinquished by			
3. Received by				6. Received by			

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

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*
Sandia National Laboratories
*
*
Radiation Protection Sample Diagnostics Program [881 Laboratory]
*
*
2-11-97 2:53:46 PM
*
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*
*
* Analyzed by: 2/11/97 Reviewed by: 2/12/97 *
****

Customer : M.YOUNG/N.CAPITAN (7585/IT)
Customer Sample ID : 030768-02
Lab Sample ID : 70021801

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 701.000 gram
Sample Date/Time : 2-11-97 9:16:00 AM
Acquire Start Date/Time : 2-11-97 1:11:01 PM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.16E+00
TH-234	1.07E+00	3.64E-01	3.66E-01
RA-226	1.33E+00	8.60E-01	5.49E-01
PB-214	6.35E-01	3.30E-01	1.04E-01
BI-214	6.13E-01	1.28E-01	4.80E-02
TH-232	7.01E-01	3.74E-01	1.38E-01
RA-228	7.40E-01	2.71E-01	1.95E-01
AC-228	7.46E-01	2.73E-01	9.23E-02
TH-228	Not Detected	---	6.64E-01
RA-224	7.17E-01	2.74E-01	9.91E-02
PB-212	7.44E-01	1.71E-01	3.85E-02
BI-212	8.54E-01	5.15E-01	3.41E-01
TL-208	6.56E-01	4.41E-01	7.32E-02
U-235	Not Detected	---	1.70E-01
TH-231	Not Detected	---	1.49E+00
PA-231	Not Detected	---	1.30E+00
TH-227	Not Detected	---	3.53E-01
RA-223	Not Detected	---	1.03E-01
RN-219	Not Detected	---	3.88E-01
PB-211	Not Detected	---	8.53E-01
TL-207	Not Detected	---	1.51E+01
AM-241	Not Detected	---	1.45E-01
PU-239	Not Detected	---	3.13E+02
NP-237	Not Detected	---	2.25E-01
PA-233	Not Detected	---	5.57E-02
TH-229	Not Detected	---	1.68E-01

[Summary Report] - Sample ID: : 70021801

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.34E-02
AG-110m	Not Detected	---	3.79E-02
BA-133	Not Detected	---	5.97E-02
BE-7	Not Detected	---	2.42E-01
CD-109	~~1.63E+00~~	~~4.75E-01~~	5.84E-01
CD-115	Not Detected	---	6.87E-02
CE-139	Not Detected	---	2.44E-02
CE-141	Not Detected	---	3.88E-02
CE-144	Not Detected	---	1.66E-01
CO-56	Not Detected	---	3.63E-02
CO-57	Not Detected	---	2.14E-02
CO-58	Not Detected	---	3.59E-02
CO-60	Not Detected	---	4.07E-02
CR-51	Not Detected	---	2.20E-01
CS-134	Not Detected	---	5.59E-02
CS-137	4.55E-02	3.46E-02	2.38E-02
EU-152	Not Detected	---	2.63E-01
EU-154	Not Detected	---	1.87E-01
EU-155	Not Detected	---	8.58E-02
FE-59	Not Detected	---	7.92E-02
GD-153	Not Detected	---	6.37E-02
HG-203	Not Detected	---	2.65E-02
I-131	Not Detected	---	2.84E-02
IR-192	Not Detected	---	2.61E-02
K-40	1.74E+01	2.69E+00	3.04E-01
MN-52	Not Detected	---	3.62E-02
MN-54	Not Detected	---	3.69E-02
MO-99	Not Detected	---	2.73E-01
NA-22	Not Detected	---	4.74E-02
NA-24	Not Detected	---	4.40E-02
NB-95	Not Detected	---	1.69E-01
ND-147	Not Detected	---	2.04E-01
NI-57	Not Detected	---	5.99E-02
RU-103	Not Detected	---	2.81E-02
RU-106	Not Detected	---	3.23E-01
SB-122	Not Detected	---	4.21E-02
SB-124	Not Detected	---	3.41E-02
SB-125	Not Detected	---	8.04E-02
SR-85	Not Detected	---	3.94E-02
TA-182	Not Detected	---	1.74E-01
TA-183	Not Detected	---	1.26E-01
TC-99m	Not Detected	---	3.18E-02
TL-201	Not Detected	---	7.64E-02
XE-133	Not Detected	---	7.05E-02
Y-88	Not Detected	---	3.40E-02
ZN-65	Not Detected	---	1.16E-01
ZR-95	Not Detected	---	6.20E-02

NOT Detected mec 2/11/97 mec

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

2-11-97 3:50:35 PM

Analyzed by: 2/11/97 Reviewed by: 2/12/97

Customer : M.YOUNG/N.CAPITAN (7585/IT)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 70021802

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 2-11-97 3:38:12 PM
Detector Name : LAB03
Elapsed Live/Real Time : 600 / 607 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	6.36E+03
TH-234	Not Detected	---	2.70E+03
RA-226	Not Detected	---	5.59E+03
PB-214	Not Detected	---	6.97E+02
BI-214	Not Detected	---	6.89E+02
TH-232	Not Detected	---	2.08E+03
RA-228	Not Detected	---	3.16E+03
AC-228	Not Detected	---	1.80E+03
TH-228	Not Detected	---	6.01E+04
RA-224	Not Detected	---	2.20E+03
PB-212	Not Detected	---	4.50E+03
BI-212	Not Detected	---	4.79E+04
TL-208	Not Detected	---	9.24E+03
U-235	Not Detected	---	1.40E+03
TH-231	Not Detected	---	8.68E+03
PA-231	Not Detected	---	1.30E+04
TH-227	Not Detected	---	2.26E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.62E+03
PB-211	Not Detected	---	1.25E+04
TL-207	Not Detected	---	2.43E+05
AM-241	8.58E+04	1.36E+04	1.14E+03
PU-239	Not Detected	---	2.53E+06
NP-237	Not Detected	---	1.37E+03
PA-233	Not Detected	---	5.84E+02
TH-229	Not Detected	---	1.26E+03

[Summary Report] - Sample ID: : 70021802

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.73E+02
AG-110m	Not Detected	---	1.01E+06
BA-133	Not Detected	---	6.32E+02
BE-7	Not Detected	---	3.17E+16
CD-109	3.22E+05	1.57E+05	1.18E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	2.12E+07
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	3.69E+05
CO-56	Not Detected	---	3.84E+11
CO-57	Not Detected	---	6.28E+04
CO-58	Not Detected	---	2.18E+12
CO-60	7.47E+04	1.01E+04	4.31E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	2.64E+03
CS-137	6.73E+04	8.83E+03	3.30E+02
EU-152	Not Detected	---	3.98E+03
EU-154	Not Detected	---	2.71E+03
EU-155	Not Detected	---	1.67E+03
FE-59	Not Detected	---	3.17E+18
GD-153	Not Detected	---	3.51E+05
HG-203	Not Detected	---	1.70E+17
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	6.14E+11
K-40	Not Detected	---	1.76E+03
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	6.89E+04
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.19E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
RU-103	Not Detected	---	1.36E+20
RU-106	Not Detected	---	2.49E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	9.31E+13
SB-125	Not Detected	---	5.33E+03
SR-85	Not Detected	---	1.72E+13
TA-182	Not Detected	---	1.44E+09
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	5.66E+08
ZN-65	Not Detected	---	7.10E+05
ZR-95	Not Detected	---	3.92E+13

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
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Report Date : 2-11-97 3:51:13 PM
QA File : C:\GENIEPC\CAMFILES\LCS3.QAF
Analyst : FCD
Sample ID : 70021802
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 2-11-97 3:38:12 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 607 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.732E-02	2.511E-03	8.583E-02	<	:	:	: >
CS-137 Activity	6.695E-02	7.682E-04	6.726E-02	<	:	:	: >
CO-60 Activity	7.415E-02	9.976E-04	7.406E-02	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____ 2/11/97

Features 58WW, 58XX, and 58YY

Internal Lab

Batch No. 900130

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SAR/WR No.

AR/COC 601311

Dept. No./Mail Stop:	6134/1148	Date Sampled/Shipped: [redacted] SMO Use: 1/20/99	Contract No.: ~~AJ-2480A~~ OR NA
Project/Task Manager:	~~Site 8/58~~ Caroline Byrd	Carrier/Waybill No.: [redacted]	Case No.: 7213.220600
Project Name:	Foothill Test Area - Site 58	Lab Contact: c.c ~~Edie Kent~~ Fernando D.	SMO Authorization:
Record Center Code:	ER/1333/58/DAT	Lab Destination: c.c ~~SEL~~ AMTL	Bill To: Sandia National Laboratories
Logbook Ref. No.:		SMO Contact/Phone: Doug Salmi/848-0963	Supplier Services Dept.:
Service Order No.	CF00655	Send Report to SMO: Robert Rivera	P.O. Box 5800 MS 0154
Location	NA		

COPY

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Lab Sample ID
044107-004	S58UP1-GR-001-0-SS	0	58	11899/1040	s	M	500m	none	G	SA	Gamma Spec	[redacted]
044108-004	S58UP2-GR-001-0-SS	0	58	11899/1100	s	M	500m	none	G	SA	Gamma Spec	
044109-004	S58WP-GR-001-0-SS	0	58	11899/1130	s	M	500m	none	G	SA	Gamma Spec	
044110-004	S8YV-GR-001-0-SS	0	58	11999/1500	s	M	500m	none	G	SA	Gamma Spec	
044111-004	S8YV-GR-002-0-SS	0	58	11999/1510	s	M	500m	none	G	SA	Gamma Spec	
044112-004	S8YV-GR-003-0-SS	0	58	11999/1525	s	M	500m	none	G	SA	Gamma Spec	
044113-004	S8YV-GR-004-0-SS	0	58	11999/1537	s	M	500m	none	G	SA	Gamma Spec	
044114-004	S8YV-GR-005-0-SS	0	58	11999/1549	s	M	500m	none	G	SA	Gamma Spec	
044115-004	S8YV-GR-006-0-SS	0	58	11999/1601	s	M	500m	none	G	SA	Gamma Spec	
044196-004	S8YV-GR-101-0-SD	0	58	11999/1537	s	M	500m	none	G	SA	Gamma Spec	

RMMA	☒ Yes ☐ No	Ref. No.	[redacted]
Sample Disposal	☒ Return to Client	☒ Disposal by lab	[redacted]
Turnaround Time	☐ Normal	☒ Rush	[redacted]
	Required Report Date		[redacted]

Special Instructions/QC Requirements

EDD ☐ Yes ☒ No

Raw Data Package ☐ Yes ☒ No

This CoC releases CoC 601310 and 601331.

Please list as separate report.

	Name	Signature	Init	Company/Organization/Phone
Sample Team Members	Chris Catechis	Ch. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	William J. Gibson Jr	WJG	MDM/6131/235-3841

1.Relinquished by	William J. Gibson Jr	Org. 6131	Date 1-20-99	Time 13:08	4.Relinquished by	Org.	Date	Time
1. Received by	Scott Gibson (SMO)	Org. 7578	Date 1-20-99	Time 1308	4. Received by	Org.	Date	Time
2.Relinquished by	Scott Gibson (SMO)	Org. 7578	Date 1-20-99	Time 1540	5.Relinquished by	Org.	Date	Time
2. Received by	[redacted]	Org. SMO 7578	Date 1-20-99	Time 1540	5. Received by	Org.	Date	Time
3 Relinquished by	[redacted]	Org. [redacted]	Date 1/22/99	Time 741	6 Relinquished by	Org.	Date	Time
3. Received by	[redacted]	Org. [redacted]	Date 1/22/99	Time 0741	6. Received by	Org.	Date	Time

Survey Number: S15672

RADIOLOGICAL SURVEY FORM

Location ER site 58	Requester/Org. Ed Mignardot \ 6134	Date 1/19/99	Time 1700	Duration 1.0
Purpose Samples		Request # N\A	RWP # 0309	RPIR # N\A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1 \ HP 260 \ 2883	N\A	Arthur L Tucker	
N\A	N\A	N\A	N\A
N\A	N\A	N\A	N\A

#	Item Description/Location	BETA-GAMMA ACTIVITY Counting Data Attached ☒Yes ☐No % Eff. 0.2 /Radionuclide N\A				ALPHA ACTIVITY Counting Data Attached ☒Yes ☐No % Eff. N\A /Radionuclide N\A				RADIATION SURVEY Bkg. N\A	
		cpm	Bkg. cpm	dpm / 100 cm² [1]	T/R/F [2]	cpm	Bkg. cpm	dpm / 100 cm² [1]	T/R/F [2]	mrem/hr [3]	Distance
1	Sample #441321	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
2	Sample #44135	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
3	Sample #44130	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
4	Sample #44125	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
5	Sample #44131	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
6	Sample #44128	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
7	Sample #44129	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
8	Sample #44127	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
9	Sample #44126	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
10	Sample #44136	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
11	Sample #44133	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A

[1] If area other than 100 cm², record as dpm/probe, or dpm/I.A.W. [2] Total/Removable/Fixed [3] Indicate type, if other than gamma (i.e., n, α, or β).

Remarks: NCD = No Contamination Detected

COPY

	Reviewed by:	Date:

Survey Number: S15672

RADIOLOGICAL SURVEY FORM CONTINUATION

#	Item Description/Location	BETA-GAMMA ACTIVITY				ALPHA ACTIVITY				RADIATION SURVEY	
		cpm	Bkg. cpm	dpm / 100 cm² (1)	T/R/F(2)	cpm	Bkg. cpm	dpm / 100 cm² (1)	T/R/F(2)	mrem/hr (3)	Distance
12	Sample #44115	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
13	Sample #44114	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
14	Sample #44196	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
15	Sample #44110	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
16	Sample #44111	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
17	Sample #44112	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
18	Sample #44113	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
					N\A						

(1) If area other than 100 cm², record as dpm/probe, or dpm/LAW. (2) Total/Removable/Fixed. (3) Indicate type, if other than gamma (i.e., n, α, or β).

COPY

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Site 8/SD
Phone: 845-0868
Date Results Needed: 1-21-99
Suspect Isotopes: 4 NK
Other Information: 72 MB. 2206

Hazards/Special Instructions:

CoC 601311

Batch Log Number: 900130
Logged By: TM

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044107 - 004	Soil	11899/1040	500 ml	Gamma Spec	01	< 300	776 g	
044108 - 004		11899/1100			02		784 g	
044109 - 004		11899/1130			03		832 g	
044110 - 004		11999/1500			04		857 g	
044111 - 004		11999/1510			05		930 g	
044112 - 004		11999/1525			06		790 g	
044113 - 004		11999/1537			07		949 g	
044114 - 004		11999/1549			08		884 g	
044115 - 004		11999/1601			09		590 g	
044116 - 004		11999/1537			10	< 300	895 g	
LCS	—	1/18/99	—	Gamma Spec	11	N/A	N/A	

Relinquished by [signature] Date 1/20/99 Time 1545 Received by [signature] Date 1/20/99 Time 1545
Relinquished by [signature] Date 1/22/99 Time 0741 Received by [signature] Date 1/22/99 Time 0741
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

1/21/99 9:13:07 AM

****

Analyzed by: 1/21/99 Reviewed by: 1/21/99

****

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044107-004
Lab Sample ID : 90013001

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 776.000 gram
Sample Date/Time : 1/18/99 10:40:00 AM
Acquire Start Date/Time : 1/20/99 5:08:00 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	5.36E-001
RA-226	1.42E+000	8.61E-001	5.53E-001
PB-214	6.41E-001	1.44E-001	6.31E-002
BI-214	5.74E-001	4.68E-001	4.99E-002
PB-210	Not Detected	---------	7.88E+000
TH-232	8.78E-001	4.65E-001	1.30E-001
RA-228	9.10E-001	3.44E-001	1.68E-001
AC-228	8.03E-001	2.38E-001	8.88E-002
TH-228	7.63E-001	2.56E-001	4.71E-001
RA-224	9.81E-001	6.94E-001	8.54E-002
PB-212	8.52E-001	2.60E-001	4.20E-002
BI-212	8.57E-001	5.77E-001	3.20E-001
TL-208	6.98E-001	1.80E-001	7.65E-002
U-235	Not Detected	---------	1.97E-001
TH-231	Not Detected	---------	7.23E+000
PA-231	Not Detected	---------	1.26E+000
TH-227	Not Detected	---------	3.07E-001
RA-223	Not Detected	---------	1.38E-001
RN-219	Not Detected	---------	3.70E-001
PB-211	Not Detected	---------	8.14E-001
TL-207	Not Detected	---------	1.49E+001
AM-241	Not Detected	---------	1.95E-001
PU-239	Not Detected	---------	3.62E+002
NP-237	Not Detected	---------	2.55E-001
PA-233	Not Detected	---------	5.66E-002
TH-229	Not Detected	---------	1.67E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013001

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.00E-002
AG-110m	Not Detected	---------	5.55E-002
BA-133	Not Detected	---------	4.69E-002
BE-7	Not Detected	---------	2.55E-001
CD-109	Not Detected	---------	8.27E-001
CD-115	Not Detected	---------	1.37E-001
CE-139	Not Detected	---------	2.52E-002
CE-141	Not Detected	---------	4.58E-002
CE-144	Not Detected	---------	1.89E-001
CO-56	Not Detected	---------	3.51E-002
CO-57	Not Detected	---------	2.46E-002
CO-58	Not Detected	---------	3.45E-002
CO-60	Not Detected	---------	3.94E-002
CR-51	Not Detected	---------	2.36E-001
CS-134	Not Detected	---------	3.19E-002
CS-137	2.71E-001	2.11E-001	2.42E-002
EU-152	Not Detected	---------	7.30E-002
EU-154	Not Detected	---------	1.93E-001
EU-155	Not Detected	---------	1.14E-001
FE-59	Not Detected	---------	8.18E-002
GD-153	Not Detected	---------	6.67E-002
HG-203	Not Detected	---------	3.04E-002
I-131	Not Detected	---------	3.59E-002
IR-192	Not Detected	---------	2.62E-002
K-40	1.70E+001	2.64E+000	6.29E-001
MN-52	Not Detected	---------	4.39E-002
MN-54	Not Detected	---------	3.66E-002
MO-99	Not Detected	---------	4.25E-001
NA-22	Not Detected	---------	4.53E-002
NA-24	Not Detected	---------	4.34E-001
NB-95	Not Detected	---------	1.68E-001
ND-147	Not Detected	---------	2.34E-001
NI-57	Not Detected	---------	1.76E-001
RU-103	Not Detected	---------	2.81E-002
RU-106	Not Detected	---------	2.92E-001
SB-122	Not Detected	---------	7.07E-002
SB-124	Not Detected	---------	2.71E-002
SB-125	Not Detected	---------	8.14E-002
SN-113	Not Detected	---------	3.87E-002
SR-85	Not Detected	---------	3.60E-002
TA-182	Not Detected	---------	1.66E-001
TA-183	Not Detected	---------	2.27E-001
TC-99m	Not Detected	---------	1.33E+001
TL-201	Not Detected	---------	1.54E-001
XE-133	Not Detected	---------	1.66E-001
Y-88	Not Detected	---------	2.87E-002
ZN-65	Not Detected	---------	1.08E-001
ZR-95	Not Detected	---------	5.82E-002

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/20/99 8:30:17 PM
*
****

* Analyzed by: 1/21/99 Reviewed by: 1/21/99 *

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044108-004
Lab Sample ID : 90013002

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 784.000 gram
Sample Date/Time : 1/18/99 11:00:00 AM
Acquire Start Date/Time : 1/20/99 6:50:03 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.41E-001
RA-226	1.47E+000	1.10E+000	5.42E-001
PB-214	6.54E-001	1.50E-001	6.37E-002
BI-214	6.14E-001	1.34E-001	4.80E-002
PB-210	Not Detected	---	4.51E+000
TH-232	9.40E-001	4.70E-001	1.65E-001
RA-228	8.01E-001	3.06E-001	1.71E-001
AC-228	8.60E-001	2.23E-001	9.14E-002
TH-228	1.12E+000	6.58E-001	4.49E-001
RA-224	9.95E-001	3.80E-001	8.64E-002
PB-212	9.13E-001	4.98E-001	4.23E-002
BI-212	9.69E-001	6.05E-001	3.38E-001
TL-208	7.83E-001	5.42E-001	6.95E-002
U-235	Not Detected	---	2.03E-001
TH-231	Not Detected	---	7.25E+000
PA-231	Not Detected	---	1.34E+000
TH-227	Not Detected	---	3.08E-001
RA-223	Not Detected	---	1.39E-001
RN-219	Not Detected	---	3.70E-001
PB-211	Not Detected	---	8.52E-001
TL-207	Not Detected	---	1.44E+001
AM-241	Not Detected	---	1.98E-001
PU-239	Not Detected	---	3.72E+002
NP-237	~~5.54E-001~~	~~2.66E-001~~	2.06E-001
PA-233	Not Detected	---	5.66E-002
TH-229	Not Detected	---	1.76E-001

Not detected

1/21/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013002

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.08E-002
AG-110m	Not Detected	---	5.20E-002
BA-133	Not Detected	---	4.70E-002
BE-7	Not Detected	---	2.72E-001
CD-109	Not Detected	---	8.41E-001
CD-115	Not Detected	---	1.48E-001
CE-139	Not Detected	---	2.56E-002
CE-141	Not Detected	---	4.64E-002
CE-144	Not Detected	---	1.97E-001
CO-56	Not Detected	---	3.59E-002
CO-57	Not Detected	---	2.45E-002
CO-58	Not Detected	---	3.58E-002
CO-60	Not Detected	---	3.93E-002
CR-51	Not Detected	---	2.39E-001
CS-134	Not Detected	---	3.41E-002
CS-137	2.24E-001	6.46E-002	2.63E-002
EU-152	Not Detected	---	7.41E-002
EU-154	Not Detected	---	2.01E-001
EU-155	Not Detected	---	1.19E-001
FE-59	Not Detected	---	8.26E-002
GD-153	Not Detected	---	6.82E-002
HG-203	Not Detected	---	3.12E-002
I-131	Not Detected	---	3.56E-002
IR-192	Not Detected	---	2.79E-002
K-40	1.79E+001	2.72E+000	6.08E-001
MN-52	Not Detected	---	4.65E-002
MN-54	Not Detected	---	1.97E-002
MO-99	Not Detected	---	4.35E-001
NA-22	Not Detected	---	4.61E-002
NA-24	Not Detected	---	4.52E-001
NB-95	Not Detected	---	1.69E-001
ND-147	Not Detected	---	2.26E-001
NI-57	Not Detected	---	1.65E-001
RU-103	Not Detected	---	3.04E-002
RU-106	Not Detected	---	3.01E-001
SB-122	Not Detected	---	7.59E-002
SB-124	Not Detected	---	2.99E-002
SB-125	Not Detected	---	7.82E-002
SN-113	Not Detected	---	3.86E-002
SR-85	Not Detected	---	3.72E-002
TA-182	Not Detected	---	1.66E-001
TA-183	Not Detected	---	2.32E-001
TC-99m	Not Detected	---	1.61E+001
TL-201	Not Detected	---	1.57E-001
XE-133	Not Detected	---	1.71E-001
Y-88	Not Detected	---	2.89E-002
ZN-65	Not Detected	---	1.12E-001
ZR-95	Not Detected	---	5.90E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/20/99 10:12:20 PM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044109-004
Lab Sample ID : 90013003

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 832.000 gram
Sample Date/Time : 1/18/99 11:30:00 AM
Acquire Start Date/Time : 1/20/99 8:32:06 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.88E-001
RA-226	1.71E+000	8.89E-001	5.23E-001
PB-214	6.61E-001	1.45E-001	6.36E-002
BI-214	6.50E-001	6.67E-001	5.12E-002
PB-210	Not Detected	---------	7.90E+000
TH-232	1.04E+000	5.32E-001	1.46E-001
RA-228	7.88E-001	3.30E-001	1.63E-001
AC-228	9.32E-001	2.56E-001	9.68E-002
TH-228	1.03E+000	3.38E-001	4.66E-001
RA-224	1.00E+000	3.82E-001	8.86E-002
PB-212	9.32E-001	1.69E-001	3.99E-002
BI-212	9.34E-001	5.24E-001	3.35E-001
TL-208	9.13E-001	3.99E-001	6.83E-002
U-235	1.56E-001	1.74E-001	2.03E-001
TH-231	Not Detected	---------	7.30E+000
PA-231	Not Detected	---------	1.27E+000
TH-227	Not Detected	---------	3.02E-001
RA-223	Not Detected	---------	1.38E-001
RN-219	Not Detected	---------	3.65E-001
PB-211	Not Detected	---------	7.95E-001
TL-207	Not Detected	---------	1.39E+001
AM-241	Not Detected	---------	1.97E-001
PU-239	Not Detected	---------	3.60E+002
NP-237	Not Detected	---------	2.46E-001
PA-233	Not Detected	---------	5.67E-002
TH-229	Not Detected	---------	1.71E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013003

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.04E-002
AG-110m	Not Detected	---	4.43E-002
BA-133	Not Detected	---	4.55E-002
BE-7	Not Detected	---	2.44E-001
CD-109	Not Detected	---	8.36E-001
CD-115	Not Detected	---	1.47E-001
CE-139	Not Detected	---	2.51E-002
CE-141	Not Detected	---	4.57E-002
CE-144	Not Detected	---	2.00E-001
CO-56	Not Detected	---	3.65E-002
CO-57	Not Detected	---	2.51E-002
CO-58	Not Detected	---	3.35E-002
CO-60	Not Detected	---	4.24E-002
CR-51	Not Detected	---	2.28E-001
CS-134	Not Detected	---	3.48E-002
CS-137	1.47E-001	5.15E-002	2.47E-002
EU-152	Not Detected	---	7.56E-002
EU-154	Not Detected	---	1.92E-001
EU-155	Not Detected	---	1.13E-001
FE-59	Not Detected	---	7.91E-002
GD-153	Not Detected	---	6.48E-002
HG-203	Not Detected	---	3.01E-002
I-131	Not Detected	---	3.42E-002
IR-192	Not Detected	---	2.67E-002
K-40	1.84E+001	2.80E+000	5.81E-001
MN-52	Not Detected	---	4.76E-002
MN-54	Not Detected	---	3.70E-002
MO-99	Not Detected	---	4.27E-001
NA-22	Not Detected	---	4.44E-002
NA-24	Not Detected	---	5.21E-001
NB-95	~~6.43E-002~~	~~3.57E-002~~	1.02E-001
ND-147	Not Detected	---	2.40E-001
NI-57	Not Detected	---	1.68E-001
RU-103	Not Detected	---	2.80E-002
RU-106	Not Detected	---	2.93E-001
SB-122	Not Detected	---	7.16E-002
SB-124	Not Detected	---	3.04E-002
SB-125	Not Detected	---	7.80E-002
SN-113	Not Detected	---	3.62E-002
SR-85	Not Detected	---	3.78E-002
TA-182	Not Detected	---	1.72E-001
TA-183	Not Detected	---	2.32E-001
TC-99m	Not Detected	---	1.85E+001
TL-201	Not Detected	---	1.60E-001
XE-133	Not Detected	---	1.73E-001
Y-88	Not Detected	---	3.39E-002
ZN-65	Not Detected	---	1.15E-001
ZR-95	Not Detected	---	5.98E-002

Not detected
1/21/99

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 1/20/99 11:54:23 PM *
****

* Analyzed by: 1/21/99 Reviewed by: 1/21/99 *

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044110-004
Lab Sample ID : 90013004

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 857.000 gram
Sample Date/Time : 1/19/99 3:00:00 PM
Acquire Start Date/Time : 1/20/99 10:14:09 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.52E-001
RA-226	1.30E+000	8.61E-001	5.43E-001
PB-214	5.04E-001	1.15E-001	5.88E-002
BI-214	4.98E-001	1.19E-001	4.43E-002
PB-210	Not Detected	---------	7.50E+000
TH-232	6.37E-001	3.79E-001	1.54E-001
RA-228	6.42E-001	2.88E-001	1.82E-001
AC-228	7.05E-001	2.13E-001	8.28E-002
TH-228	6.63E-001	2.57E-001	4.12E-001
RA-224	8.16E-001	3.56E-001	1.00E-001
PB-212	6.84E-001	1.82E-001	3.91E-002
BI-212	7.11E-001	3.96E-001	3.22E-001
TL-208	6.15E-001	1.61E-001	6.81E-002
U-235	Not Detected	---------	1.84E-001
TH-231	Not Detected	---------	6.69E+000
PA-231	Not Detected	---------	1.24E+000
TH-227	Not Detected	---------	2.70E-001
RA-223	Not Detected	---------	1.19E-001
RN-219	Not Detected	---------	3.51E-001
PB-211	Not Detected	---------	7.99E-001
TL-207	Not Detected	---------	1.45E+001
AM-241	Not Detected	---------	1.76E-001
PU-239	Not Detected	---------	3.45E+002
NP-237	Not Detected	---------	2.29E-001
PA-233	Not Detected	---------	5.69E-002
TH-229	Not Detected	---------	1.56E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013004

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.70E-002
AG-110m	Not Detected	---------	5.38E-002
BA-133	Not Detected	---------	4.22E-002
BE-7	Not Detected	---------	2.49E-001
CD-109	Not Detected	---------	7.65E-001
CD-115	Not Detected	---------	9.37E-002
CE-139	Not Detected	---------	2.31E-002
CE-141	Not Detected	---------	4.17E-002
CE-144	Not Detected	---------	1.80E-001
CO-56	Not Detected	---------	3.41E-002
CO-57	Not Detected	---------	2.18E-002
CO-58	Not Detected	---------	3.22E-002
CO-60	Not Detected	---------	4.06E-002
CR-51	Not Detected	---------	2.24E-001
CS-134	Not Detected	---------	3.10E-002
CS-137	2.76E-001	2.86E-001	2.35E-002
EU-152	Not Detected	---------	6.55E-002
EU-154	Not Detected	---------	1.77E-001
EU-155	Not Detected	---------	1.08E-001
FE-59	Not Detected	---------	8.12E-002
GD-153	Not Detected	---------	6.09E-002
HG-203	Not Detected	---------	2.87E-002
I-131	Not Detected	---------	2.89E-002
IR-192	Not Detected	---------	2.64E-002
K-40	2.23E+001	3.36E+000	5.51E-001
MN-52	Not Detected	---------	3.82E-002
MN-54	Not Detected	---------	3.76E-002
MO-99	Not Detected	---------	3.09E-001
NA-22	Not Detected	---------	4.73E-002
NA-24	Not Detected	---------	1.53E-001
NB-95	Not Detected	---------	1.26E-001
ND-147	Not Detected	---------	1.96E-001
NI-57	Not Detected	---------	8.79E-002
RU-103	Not Detected	---------	2.70E-002
RU-106	Not Detected	---------	2.89E-001
SB-122	Not Detected	---------	5.20E-002
SB-124	Not Detected	---------	2.72E-002
SB-125	Not Detected	---------	7.27E-002
SN-113	Not Detected	---------	3.52E-002
SR-85	Not Detected	---------	3.32E-002
TA-182	Not Detected	---------	1.62E-001
TA-183	Not Detected	---------	1.79E-001
TC-99m	Not Detected	---------	8.64E-001
TL-201	Not Detected	---------	1.10E-001
XE-133	Not Detected	---------	1.13E-001
Y-88	Not Detected	---------	2.80E-002
ZN-65	Not Detected	---------	1.09E-001
ZR-95	Not Detected	---------	5.45E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/21/99 9:23:35 AM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044111-004
Lab Sample ID : 90013005

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 930.000 gram
Sample Date/Time : 1/19/99 3:10:00 PM
Acquire Start Date/Time : 1/20/99 11:56:11 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	2.51E-001	3.06E-001	4.19E-001
RA-226	1.33E+000	7.66E-001	5.29E-001
PB-214	4.68E-001	1.13E-001	5.61E-002
BI-214	4.25E-001	1.14E-001	4.47E-002
PB-210	Not Detected	---	6.98E+000
TH-232	7.12E-001	3.96E-001	1.36E-001
RA-228	6.97E-001	3.07E-001	1.49E-001
AC-228	6.54E-001	2.09E-001	8.49E-002
TH-228	6.68E-001	4.73E-001	4.01E-001
RA-224	7.51E-001	2.78E-001	8.63E-002
PB-212	7.02E-001	1.38E-001	3.63E-002
BI-212	9.84E-001	5.02E-001	2.67E-001
TL-208	5.88E-001	3.92E-001	5.46E-002
U-235	Not Detected	---	1.77E-001
TH-231	Not Detected	---	6.32E+000
PA-231	Not Detected	---	1.20E+000
TH-227	Not Detected	---	2.60E-001
RA-223	Not Detected	---	1.13E-001
RN-219	Not Detected	---	3.18E-001
PB-211	Not Detected	---	7.07E-001
TL-207	Not Detected	---	1.37E+001
AM-241	Not Detected	---	1.75E-001
PU-239	Not Detected	---	3.20E+002
NP-237	~~4.37E-001~~	~~1.54E-001~~	1.74E-001 Not detected
PA-233	Not Detected	---	4.99E-002
TH-229	Not Detected	---	1.51E-001

1/21/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013005

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.53E-002
AG-110m	Not Detected	---	3.93E-002
BA-133	Not Detected	---	4.12E-002
BE-7	Not Detected	---	2.22E-001
CD-109	Not Detected	---	7.14E-001
CD-115	Not Detected	---	9.06E-002
CE-139	Not Detected	---	2.20E-002
CE-141	Not Detected	---	3.98E-002
CE-144	Not Detected	---	1.72E-001
CO-56	Not Detected	---	3.35E-002
CO-57	Not Detected	---	2.14E-002
CO-58	Not Detected	---	3.23E-002
CO-60	Not Detected	---	3.97E-002
CR-51	Not Detected	---	2.07E-001
CS-134	Not Detected	---	2.90E-002
CS-137	1.11E-001	4.24E-002	2.22E-002
EU-152	Not Detected	---	6.48E-002
EU-154	Not Detected	---	1.70E-001
EU-155	Not Detected	---	1.02E-001
FE-59	Not Detected	---	8.27E-002
GD-153	Not Detected	---	6.11E-002
HG-203	Not Detected	---	2.74E-002
I-131	Not Detected	---	2.75E-002
IR-192	Not Detected	---	2.39E-002
K-40	2.25E+001	3.30E+000	5.13E-001
MN-52	Not Detected	---	3.48E-002
MN-54	Not Detected	---	3.32E-002
MO-99	Not Detected	---	3.20E-001
NA-22	Not Detected	---	4.82E-002
NA-24	Not Detected	---	1.61E-001
NB-95	Not Detected	---	1.24E-001
ND-147	Not Detected	---	1.92E-001
NI-57	Not Detected	---	8.63E-002
RU-103	Not Detected	---	2.50E-002
RU-106	Not Detected	---	2.63E-001
SB-122	Not Detected	---	4.89E-002
SB-124	Not Detected	---	2.60E-002
SB-125	Not Detected	---	6.92E-002
SN-113	Not Detected	---	3.27E-002
SR-85	Not Detected	---	3.30E-002
TA-182	Not Detected	---	1.48E-001
TA-183	Not Detected	---	1.80E-001
TC-99m	Not Detected	---	1.00E+000
TL-201	Not Detected	---	1.12E-001
XE-133	Not Detected	---	1.10E-001
Y-88	Not Detected	---	2.88E-002
ZN-65	Not Detected	---	1.03E-001
ZR-95	Not Detected	---	5.20E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 1/21/99 8:34:49 AM *
****

* Analyzed by: 1/21/99 Reviewed by: 1/21/99 *

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044112-004
Lab Sample ID : 90013006

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 790.000 gram
Sample Date/Time : 1/19/99 3:25:00 PM
Acquire Start Date/Time : 1/20/99 5:51:35 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	7.48E-001
RA-226	1.86E+000	9.72E-001	5.93E-001
PB-214	7.71E-001	1.34E-001	4.44E-002
BI-214	6.70E-001	1.40E-001	4.41E-002
PB-210	Not Detected	---------	3.46E+001
TH-232	8.99E-001	4.02E-001	1.53E-001
RA-228	9.93E-001	3.21E-001	1.33E-001
AC-228	8.88E-001	2.25E-001	7.85E-002
TH-228	9.58E-001	3.00E-001	4.23E-001
RA-224	9.27E-001	2.23E-001	4.15E-002
PB-212	8.96E-001	1.58E-001	3.76E-002
BI-212	9.79E-001	5.22E-001	2.92E-001
TL-208	7.80E-001	1.73E-001	5.83E-002
U-235	Not Detected	---------	2.23E-001
TH-231	Not Detected	---------	1.17E+001
PA-231	Not Detected	---------	1.32E+000
TH-227	Not Detected	---------	3.53E-001
RA-223	Not Detected	---------	1.96E-001
RN-219	Not Detected	---------	3.61E-001
PB-211	Not Detected	---------	8.04E-001
TL-207	Not Detected	---------	1.18E+001
AM-241	Not Detected	---------	4.90E-001
PU-239	Not Detected	---------	4.11E+002
NP-237	~~4.96E-001~~	~~2.45E-001~~	2.84E-001 Not detected
PA-233	Not Detected	---------	5.34E-002
TH-229	Not Detected	---------	2.57E-001

1/21/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013006

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.41E-002
AG-110m	Not Detected	---	5.15E-002
BA-133	Not Detected	---	5.64E-002
BE-7	Not Detected	---	2.44E-001
CD-109	Not Detected	---	9.65E-001
CD-115	Not Detected	---	8.87E-002
CE-139	Not Detected	---	2.85E-002
CE-141	Not Detected	---	4.92E-002
CE-144	Not Detected	---	2.15E-001
CO-56	Not Detected	---	2.92E-002
CO-57	Not Detected	---	2.90E-002
CO-58	Not Detected	---	2.95E-002
CO-60	Not Detected	---	3.32E-002
CR-51	Not Detected	---	2.13E-001
CS-134	Not Detected	---	3.37E-002
CS-137	4.14E-001	7.85E-002	2.03E-002
EU-152	Not Detected	---	8.67E-002
EU-154	Not Detected	---	1.65E-001
EU-155	Not Detected	---	1.41E-001
FE-59	Not Detected	---	5.97E-002
GD-153	Not Detected	---	1.06E-001
HG-203	Not Detected	---	2.87E-002
I-131	Not Detected	---	2.82E-002
IR-192	Not Detected	---	2.56E-002
K-40	2.10E+001	2.99E+000	2.16E-001
MN-52	Not Detected	---	3.11E-002
MN-54	Not Detected	---	3.16E-002
MO-99	Not Detected	---	2.56E-001
NA-22	Not Detected	---	3.72E-002
NA-24	Not Detected	---	1.02E-001
NB-95	Not Detected	---	1.90E-001
ND-147	Not Detected	---	1.85E-001
NI-57	Not Detected	---	7.75E-002
RU-103	Not Detected	---	2.68E-002
RU-106	Not Detected	---	2.61E-001
SB-122	Not Detected	---	4.78E-002
SB-124	Not Detected	---	2.62E-002
SB-125	Not Detected	---	7.90E-002
SN-113	Not Detected	---	3.41E-002
SR-85	Not Detected	---	3.39E-002
TA-182	Not Detected	---	1.35E-001
TA-183	Not Detected	---	4.88E-001
TC-99m	Not Detected	---	6.13E-001
TL-201	Not Detected	---	2.12E-001
XE-133	Not Detected	---	1.87E-001
Y-88	Not Detected	---	2.46E-002
ZN-65	Not Detected	---	9.06E-002
ZR-95	Not Detected	---	4.92E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/20/99 9:13:36 PM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044113-004
Lab Sample ID : 90013007

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 949.000 gram
Sample Date/Time : 1/19/99 3:37:00 PM
Acquire Start Date/Time : 1/20/99 7:33:22 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.47E-001
RA-226	1.21E+000	6.49E-001	4.46E-001
PB-214	5.55E-001	1.95E-001	3.61E-002
BI-214	5.01E-001	1.06E-001	3.60E-002
PB-210	Not Detected	---------	2.91E+001
TH-232	7.45E-001	3.84E-001	1.11E-001
RA-228	8.89E-001	2.80E-001	1.16E-001
AC-228	8.13E-001	2.45E-001	6.92E-002
TH-228	8.59E-001	5.21E-001	3.73E-001
RA-224	9.21E-001	2.18E-001	2.85E-002
PB-212	7.86E-001	2.61E-001	3.17E-002
BI-212	9.08E-001	4.91E-001	2.42E-001
TL-208	6.99E-001	1.61E-001	5.24E-002
U-235	Not Detected	---------	1.88E-001
TH-231	Not Detected	---------	1.01E+001
PA-231	Not Detected	---------	1.10E+000
TH-227	Not Detected	---------	3.04E-001
RA-223	Not Detected	---------	1.70E-001
RN-219	Not Detected	---------	2.85E-001
PB-211	Not Detected	---------	6.43E-001
TL-207	Not Detected	---------	1.08E+001
AM-241	Not Detected	---------	4.03E-001
PU-239	Not Detected	---------	3.56E+002
NP-237	Not Detected	---------	2.32E-001
PA-233	Not Detected	---------	4.55E-002
TH-229	Not Detected	---------	2.19E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013007

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.94E-002
AG-110m	Not Detected	---	2.43E-002
BA-133	Not Detected	---	4.63E-002
BE-7	Not Detected	---	1.99E-001
CD-109	Not Detected	---	7.86E-001
CD-115	Not Detected	---	7.51E-002
CE-139	Not Detected	---	2.37E-002
CE-141	Not Detected	---	4.14E-002
CE-144	Not Detected	---	1.91E-001
CO-56	Not Detected	---	2.45E-002
CO-57	Not Detected	---	2.45E-002
CO-58	Not Detected	---	2.60E-002
CO-60	Not Detected	---	2.83E-002
CR-51	Not Detected	---	1.87E-001
CS-134	Not Detected	---	2.71E-002
CS-137	2.54E-002	2.01E-002	1.82E-002
EU-152	Not Detected	---	7.37E-002
EU-154	Not Detected	---	1.40E-001
EU-155	Not Detected	---	1.24E-001
FE-59	Not Detected	---	5.95E-002
GD-153	Not Detected	---	9.35E-002
HG-203	Not Detected	---	2.48E-002
I-131	Not Detected	---	2.44E-002
IR-192	Not Detected	---	2.15E-002
K-40	2.16E+001	3.06E+000	2.04E-001
MN-52	Not Detected	---	2.74E-002
MN-54	Not Detected	---	2.67E-002
MO-99	Not Detected	---	2.45E-001
NA-22	Not Detected	---	3.35E-002
NA-24	Not Detected	---	1.00E-001
NB-95	Not Detected	---	1.65E-001
ND-147	Not Detected	---	1.59E-001
NI-57	Not Detected	---	3.58E-002
RU-103	Not Detected	---	2.15E-002
RU-106	Not Detected	---	2.30E-001
SB-122	Not Detected	---	4.32E-002
SB-124	Not Detected	---	2.17E-002
SB-125	Not Detected	---	6.61E-002
SN-113	Not Detected	---	2.85E-002
SR-85	Not Detected	---	2.79E-002
TA-182	Not Detected	---	1.15E-001
TA-183	Not Detected	---	4.04E-001
TC-99m	Not Detected	---	6.01E-001
TL-201	Not Detected	---	1.93E-001
XE-133	Not Detected	---	1.67E-001
Y-88	Not Detected	---	1.77E-002
ZN-65	Not Detected	---	7.47E-002
ZR-95	Not Detected	---	4.31E-002

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

1/20/99 10:55:23 PM

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Analyzed by: 1/21/99 Reviewed by: 1/21/99

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Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044114-004
Lab Sample ID : 90013008

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 884.000 gram
Sample Date/Time : 1/19/99 3:49:00 PM
Acquire Start Date/Time : 1/20/99 9:15:10 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.05E-001
RA-226	9.42E-001	6.62E-001	4.07E-001
PB-214	4.65E-001	9.94E-002	3.91E-002
BI-214	4.35E-001	9.99E-002	3.95E-002
PB-210	Not Detected	---------	2.88E+001
TH-232	6.57E-001	3.51E-001	1.11E-001
RA-228	6.26E-001	2.68E-001	1.14E-001
AC-228	7.23E-001	1.98E-001	7.06E-002
TH-228	5.31E-001	5.77E-001	3.20E-001
RA-224	6.78E-001	1.67E-001	2.62E-002
PB-212	6.57E-001	1.37E-001	3.18E-002
BI-212	6.27E-001	5.24E-001	2.38E-001
TL-208	6.06E-001	1.48E-001	4.91E-002
U-235	Not Detected	---------	1.84E-001
TH-231	Not Detected	---------	9.89E+000
PA-231	Not Detected	---------	1.13E+000
TH-227	Not Detected	---------	2.94E-001
RA-223	Not Detected	---------	1.68E-001
RN-219	Not Detected	---------	2.88E-001
PB-211	Not Detected	---------	6.36E-001
TL-207	Not Detected	---------	1.09E+001
AM-241	Not Detected	---------	3.96E-001
PU-239	Not Detected	---------	3.37E+002
NP-237	Not Detected	---------	3.06E-001
PA-233	Not Detected	---------	4.52E-002
TH-229	Not Detected	---------	2.19E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013008

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	2.75E-002
AG-110m	Not Detected	---------	3.71E-002
BA-133	Not Detected	---------	4.50E-002
BE-7	Not Detected	---------	2.01E-001
CD-109	Not Detected	---------	1.02E+000
CD-115	Not Detected	---------	7.63E-002
CE-139	Not Detected	---------	2.38E-002
CE-141	Not Detected	---------	4.10E-002
CE-144	Not Detected	---------	1.84E-001
CO-56	Not Detected	---------	2.59E-002
CO-57	Not Detected	---------	2.45E-002
CO-58	Not Detected	---------	2.57E-002
CO-60	Not Detected	---------	3.03E-002
CR-51	Not Detected	---------	1.82E-001
CS-134	Not Detected	---------	2.88E-002
CS-137	1.92E-001	4.63E-002	1.84E-002
EU-152	Not Detected	---------	7.40E-002
EU-154	Not Detected	---------	1.34E-001
EU-155	Not Detected	---------	1.21E-001
FE-59	Not Detected	---------	6.00E-002
GD-153	Not Detected	---------	9.10E-002
HG-203	Not Detected	---------	2.48E-002
I-131	Not Detected	---------	2.52E-002
IR-192	Not Detected	---------	2.08E-002
K-40	2.21E+001	3.09E+000	1.87E-001
MN-52	Not Detected	---------	2.67E-002
MN-54	Not Detected	---------	2.73E-002
MO-99	Not Detected	---------	2.38E-001
NA-22	Not Detected	---------	3.50E-002
NA-24	Not Detected	---------	1.03E-001
NB-95	Not Detected	---------	1.62E-001
ND-147	Not Detected	---------	1.55E-001
NI-57	Not Detected	---------	6.37E-002
RU-103	Not Detected	---------	2.25E-002
RU-106	Not Detected	---------	2.09E-001
SB-122	Not Detected	---------	4.26E-002
SB-124	Not Detected	---------	2.42E-002
SB-125	Not Detected	---------	6.90E-002
SN-113	Not Detected	---------	2.85E-002
SR-85	Not Detected	---------	2.87E-002
TA-182	Not Detected	---------	1.13E-001
TA-183	Not Detected	---------	3.99E-001
TC-99m	Not Detected	---------	7.14E-001
TL-201	Not Detected	---------	1.90E-001
XE-133	Not Detected	---------	1.65E-001
Y-88	Not Detected	---------	1.73E-002
ZN-65	Not Detected	---------	7.54E-002
ZR-95	Not Detected	---------	4.36E-002

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

1/21/99 12:37:10 AM

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Analyzed by: 1/21/99 Reviewed by: 1/21/99

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Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044115-004
Lab Sample ID : 90013009

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 590.000 gram
Sample Date/Time : 1/19/99 4:01:00 PM
Acquire Start Date/Time : 1/20/99 10:56:57 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	8.16E-001
RA-226	1.16E+000	6.01E-001	5.53E-001
PB-214	6.29E-001	2.49E-001	5.00E-002
BI-214	5.36E-001	1.35E-001	5.08E-002
PB-210	Not Detected	---------	3.75E+001
TH-232	8.63E-001	4.62E-001	1.68E-001
RA-228	8.68E-001	3.32E-001	1.50E-001
AC-228	7.61E-001	2.33E-001	9.05E-002
TH-228	9.41E-001	7.04E-001	4.78E-001
RA-224	8.37E-001	2.12E-001	4.75E-002
PB-212	8.17E-001	1.28E-001	4.16E-002
BI-212	9.79E-001	5.62E-001	3.47E-001
TL-208	7.15E-001	1.94E-001	6.98E-002
U-235	Not Detected	---------	2.40E-001
TH-231	Not Detected	---------	1.27E+001
PA-231	Not Detected	---------	1.48E+000
TH-227	Not Detected	---------	3.90E-001
RA-223	Not Detected	---------	2.17E-001
RN-219	Not Detected	---------	3.78E-001
PB-211	Not Detected	---------	8.59E-001
TL-207	Not Detected	---------	1.39E+001
AM-241	Not Detected	---------	5.19E-001
PU-239	Not Detected	---------	4.48E+002
NP-237	Not Detected	---------	3.96E-001
PA-233	Not Detected	---------	5.92E-002
TH-229	Not Detected	---------	2.77E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013009

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.69E-002
AG-110m	Not Detected	---------	5.50E-002
BA-133	Not Detected	---------	6.13E-002
BE-7	Not Detected	---------	2.63E-001
CD-109	~~1.38E+000~~	~~8.89E-001~~	1.01E+000
CD-115	Not Detected	---------	1.05E-001
CE-139	Not Detected	---------	3.15E-002
CE-141	Not Detected	---------	5.31E-002
CE-144	Not Detected	---------	2.36E-001
CO-56	Not Detected	---------	3.54E-002
CO-57	Not Detected	---------	3.16E-002
CO-58	Not Detected	---------	3.32E-002
CO-60	Not Detected	---------	3.79E-002
CR-51	Not Detected	---------	2.38E-001
CS-134	Not Detected	---------	3.78E-002
CS-137	3.37E-001	7.47E-002	2.35E-002
EU-152	Not Detected	---------	9.54E-002
EU-154	Not Detected	---------	1.81E-001
EU-155	Not Detected	---------	1.56E-001
FE-59	Not Detected	---------	7.05E-002
GD-153	Not Detected	---------	1.19E-001
HG-203	Not Detected	---------	3.25E-002
I-131	Not Detected	---------	3.47E-002
IR-192	Not Detected	---------	2.75E-002
K-40	2.18E+001	3.17E+000	2.68E-001
MN-52	Not Detected	---------	3.82E-002
MN-54	Not Detected	---------	3.82E-002
MO-99	Not Detected	---------	3.25E-001
NA-22	Not Detected	---------	4.54E-002
NA-24	Not Detected	---------	1.54E-001
NB-95	Not Detected	---------	2.19E-001
ND-147	Not Detected	---------	2.21E-001
NI-57	Not Detected	---------	4.76E-002
RU-103	Not Detected	---------	2.92E-002
RU-106	Not Detected	---------	2.87E-001
SB-122	Not Detected	---------	5.65E-002
SB-124	Not Detected	---------	3.13E-002
SB-125	Not Detected	---------	9.17E-002
SN-113	~~1.05E-002~~	~~1.66E-002~~	1.85E-002
SR-85	Not Detected	---------	3.80E-002
TA-182	Not Detected	---------	1.64E-001
TA-183	Not Detected	---------	5.32E-001
TC-99m	Not Detected	---------	1.13E+000
TL-201	Not Detected	---------	2.51E-001
XE-133	Not Detected	---------	2.19E-001
Y-88	Not Detected	---------	2.31E-002
ZN-65	Not Detected	---------	1.04E-001
ZR-95	Not Detected	---------	5.57E-002

Not detected
1/21/99

Not detected
1/21/99

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/21/99 2:18:57 AM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044196-004
Lab Sample ID : 90013010

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 895.000 gram
Sample Date/Time : 1/19/99 3:37:00 PM
Acquire Start Date/Time : 1/21/99 12:38:43 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.69E-001
RA-226	1.30E+000	7.77E-001	4.29E-001
PB-214	5.36E-001	1.19E-001	4.31E-002
BI-214	5.48E-001	1.13E-001	3.79E-002
PB-210	Not Detected	---------	3.05E+001
TH-232	8.13E-001	4.25E-001	1.33E-001
RA-228	8.25E-001	2.72E-001	1.22E-001
AC-228	8.29E-001	1.53E-001	6.71E-002
TH-228	8.82E-001	8.36E-001	3.98E-001
RA-224	8.98E-001	2.14E-001	3.34E-002
PB-212	8.60E-001	1.52E-001	3.21E-002
BI-212	8.78E-001	5.24E-001	2.75E-001
TL-208	7.29E-001	1.38E-001	5.36E-002
U-235	Not Detected	---------	1.93E-001
TH-231	Not Detected	---------	1.09E+001
PA-231	Not Detected	---------	1.16E+000
TH-227	Not Detected	---------	3.18E-001
RA-223	Not Detected	---------	1.81E-001
RN-219	Not Detected	---------	3.05E-001
PB-211	Not Detected	---------	6.82E-001
TL-207	Not Detected	---------	1.12E+001
AM-241	Not Detected	---------	4.24E-001
PU-239	Not Detected	---------	3.67E+002
NP-237	Not Detected	---------	2.36E-001
PA-233	Not Detected	---------	4.53E-002
TH-229	Not Detected	---------	2.29E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013010

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.00E-002
AG-110m	Not Detected	---------	2.60E-002
BA-133	Not Detected	---------	4.69E-002
BE-7	Not Detected	---------	1.94E-001
CD-109	Not Detected	---------	8.02E-001
CD-115	Not Detected	---------	8.49E-002
CE-139	Not Detected	---------	2.55E-002
CE-141	Not Detected	---------	4.28E-002
CE-144	Not Detected	---------	2.02E-001
CO-56	Not Detected	---------	2.80E-002
CO-57	Not Detected	---------	2.63E-002
CO-58	Not Detected	---------	2.60E-002
CO-60	Not Detected	---------	3.24E-002
CR-51	Not Detected	---------	1.97E-001
CS-134	Not Detected	---------	2.97E-002
CS-137	1.20E-002	1.63E-002	1.59E-002
EU-152	Not Detected	---------	7.85E-002
EU-154	Not Detected	---------	1.45E-001
EU-155	Not Detected	---------	1.31E-001
FE-59	Not Detected	---------	6.28E-002
GD-153	Not Detected	---------	9.62E-002
HG-203	Not Detected	---------	2.62E-002
I-131	Not Detected	---------	2.58E-002
IR-192	Not Detected	---------	2.21E-002
K-40	2.39E+001	3.36E+000	2.02E-001
MN-52	Not Detected	---------	2.74E-002
MN-54	Not Detected	---------	1.94E-002
MO-99	Not Detected	---------	2.68E-001
NA-22	Not Detected	---------	3.57E-002
NA-24	Not Detected	---------	1.20E-001
NB-95	Not Detected	---------	1.80E-001
ND-147	Not Detected	---------	1.79E-001
NI-57	Not Detected	---------	4.66E-002
RU-103	Not Detected	---------	2.39E-002
RU-106	Not Detected	---------	2.30E-001
SB-122	Not Detected	---------	4.59E-002
SB-124	Not Detected	---------	2.34E-002
SB-125	Not Detected	---------	6.93E-002
SN-113	Not Detected	---------	3.13E-002
SR-85	Not Detected	---------	2.95E-002
TA-182	Not Detected	---------	1.26E-001
TA-183	Not Detected	---------	4.35E-001
TC-99m	Not Detected	---------	1.15E+000
TL-201	Not Detected	---------	2.11E-001
XE-133	Not Detected	---------	1.90E-001
Y-88	Not Detected	---------	1.94E-002
ZN-65	Not Detected	---------	8.21E-002
ZR-95	Not Detected	---------	4.52E-002

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

1/21/99 6:29:13 AM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90013011

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/21/99 6:18:59 AM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	2.60E+003
RA-226	Not Detected	---------	5.18E+003
PB-214	Not Detected	---------	7.17E+002
BI-214	Not Detected	---------	6.59E+002
PB-210	Not Detected	---------	6.88E+004
TH-232	Not Detected	---------	2.20E+003
RA-228	Not Detected	---------	2.98E+003
AC-228	Not Detected	---------	1.75E+003
TH-228	Not Detected	---------	1.30E+005
RA-224	Not Detected	---------	7.91E+003
PB-212	Not Detected	---------	8.95E+003
BI-212	Not Detected	---------	9.22E+004
TL-208	Not Detected	---------	1.94E+004
U-235	Not Detected	---------	1.41E+003
TH-231	Not Detected	---------	4.40E+004
PA-231	Not Detected	---------	1.38E+004
TH-227	Not Detected	---------	2.33E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	6.00E+003
PB-211	Not Detected	---------	1.35E+004
TL-207	Not Detected	---------	2.59E+005
AM-241	8.37E+004	1.43E+004	1.35E+003
PU-239	Not Detected	---------	2.37E+006
NP-237	Not Detected	---------	1.33E+003
PA-233	Not Detected	---------	6.27E+002
TH-229	Not Detected	---------	1.13E+003

[Summary Report] - Sample ID: : 90013011

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.59E+002
AG-110m	Not Detected	---	7.61E+006
BA-133	Not Detected	---	7.82E+002
BE-7	Not Detected	---	3.32E+020
CD-109	4.51E+005	5.72E+005	3.24E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	6.92E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.03E+006
CO-56	Not Detected	---	2.19E+014
CO-57	Not Detected	---	3.65E+005
CO-58	Not Detected	---	2.27E+015
CO-60	7.72E+004	1.06E+004	5.79E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.88E+003
CS-137	6.99E+004	9.39E+003	3.07E+002
EU-152	Not Detected	---	7.95E+002
EU-154	Not Detected	---	3.06E+003
EU-155	Not Detected	---	2.62E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	2.51E+006
HG-203	Not Detected	---	7.04E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	5.13E+014
K-40	Not Detected	---	1.69E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	3.27E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.90E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	9.06E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	3.13E+017
SB-125	Not Detected	---	9.00E+003
SN-113	Not Detected	---	3.27E+010
SR-85	Not Detected	---	3.39E+016
TA-182	Not Detected	---	9.49E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	5.47E+010
ZN-65	Not Detected	---	5.04E+006
ZR-95	Not Detected	---	7.79E+016

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report

Report Date : 1/21/99 6:29:16 AM
QA File : C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst : FCD
Sample ID : 90013011
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/21/99 6:18:59 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 ACTIVITY	8.553E-002	2.525E-003	8.371E-002	<			>
CS-137 Activity	6.836E-002	9.861E-004	6.994E-002	<			>
CO-60 Activity	7.598E-002	2.687E-003	7.793E-002	<			>

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 1/21/99

Survey #:_____

Page _____ of _____

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 1/21/99 6:04:06 AM *

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* *
* Analyzed by: 1/21/99 Reviewed by: 1.12.99 *

****

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90013012

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/21/99 5:53:52 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 606 seconds

Comments:

****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	4.14E+003
RA-226	Not Detected	---------	5.78E+003
PB-214	Not Detected	---------	6.36E+002
BI-214	Not Detected	---------	5.46E+002
PB-210	Not Detected	---------	2.67E+005
TH-232	Not Detected	---------	1.94E+003
RA-228	Not Detected	---------	2.32E+003
AC-228	Not Detected	---------	1.37E+003
TH-228	Not Detected	---------	1.22E+005
RA-224	Not Detected	---------	4.53E+003
PB-212	Not Detected	---------	9.31E+003
BI-212	Not Detected	---------	7.56E+004
TL-208	Not Detected	---------	1.68E+004
U-235	Not Detected	---------	1.61E+003
TH-231	Not Detected	---------	7.51E+004
PA-231	Not Detected	---------	1.29E+004
TH-227	Not Detected	---------	2.43E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	5.46E+003
PB-211	Not Detected	---------	1.23E+004
TL-207	Not Detected	---------	1.98E+005
AM-241	7.80E+004	7.97E+004	2.83E+003
PU-239	Not Detected	---------	2.83E+006
NP-237	Not Detected	---------	2.13E+003
PA-233	Not Detected	---------	5.49E+002
TH-229	Not Detected	---------	1.75E+003

Survey #:_____

Page _____ of _____

[Summary Report] - Sample ID: : 90013012

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	2.89E+002
AG-110m	Not Detected	---	5.99E+006
BA-133	Not Detected	---	6.85E+002
BE-7	Not Detected	---	2.82E+020
CD-109	Not Detected	---	6.11E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	7.86E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.37E+006
CO-56	Not Detected	---	1.66E+014
CO-57	Not Detected	---	4.42E+005
CO-58	Not Detected	---	1.68E+015
CO-60	8.20E+004	1.10E+004	4.18E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.16E+003
CS-137	7.16E+004	9.51E+003	2.37E+002
EU-152	Not Detected	---	9.56E+002
EU-154	Not Detected	---	2.46E+003
EU-155	Not Detected	---	3.29E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	4.07E+006
HG-203	Not Detected	---	6.61E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	4.59E+014
K-40	Not Detected	---	1.30E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	2.48E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.71E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	7.45E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	2.76E+017
SB-125	Not Detected	---	8.33E+003
SN-113	Not Detected	---	2.91E+010
SR-85	Not Detected	---	2.88E+016
TA-182	Not Detected	---	7.20E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	4.19E+010
ZN-65	Not Detected	---	3.70E+006
ZR-95	Not Detected	---	6.05E+016

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report

Report Date : 1/21/99 6:04:10 AM
QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 90013012
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/21/99 5:53:52 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.193E-002	4.095E-003	7.805E-002	<	:	:	: >
CS-137 Activity	7.056E-002	1.986E-003	7.157E-002	<	:	:	: >
CO-60 Activity	7.852E-002	2.177E-003	8.103E-002	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____ 1/21/99

Shipping Code: 2 Control No.: 138600

SHIPPER

SF 6951-AEF (5-98)
Supersedes (1-98) Issue

Sandia National Laboratories
1515 Eubank SE
Albuquerque, NM 87123

Blocks with RED letters are required.
Press F1 for instructions for each field.
NOTE: If text entered wraps, the form could print on second page.

(1) FROM: ☒ New Mexico ☐ California ☐ Other

Before Filling Out Form Call 845-0068 for Document Number | (2) Document No. 716551

(3) SHIP TO:

General Engineering Laboratories
Attn: Edie Kent Tel: 843-556-8171
2040 Savage Rd.
Charleston, SC 29414

Contract#: AJ-2480A 91310 601331

COC #: 601005; 601144 601314
NO

(10) RMA # (if applicable) SITE 2 YUCA. SITE 8/58
LEAKED CANNON BORN SITE.

(4) Date Prepared: 1-22-99 | (5) Highest Material Security Classification: UNC | (6) Page 1 of 1

(7) Nuclear Explosive-Like Assembly (NELA)? ☐ Yes ☒ No

(8) Date to be returned: ☒ No Return

(9) Date Due at Destination: 1-23-99 ☒ Firm: (CA only-see instructions or press F1 for PTA justification) ☐ Flex. (Must use Commercial Transportation)

* SATURDAY DELIVERY

(11a) Form Filled Out By (Name)	(11b) Phone:	(12) Case No:	(13) Freight Billing: Sandia Pays ☒ Consignee Pays ☐ If Consignee Pays, Carrier & acct. no.
Robert P. Rivera, 7578	505-845-0868	0876.123000	

(14a) Requester Name:	(14b) Org:	(14c) MS:	(14d) Phone:	(14e) SSN:
Same	7578	1042	505-845-0868	375-64-5982

Pickup Location: (15a) Bldg:	(15b) Room:	New Sandia Location (if applicable) (16a) Site Code:	(16b) Bldg:	(16c) Room:	(16d) Org:
N/A	N/A	N/A	N/A	N/A	N/A

(17) Reason for Shipment: (must select one):	(18) Authority Number:	(19) DOE Transportation Safeguards Dept. Courier Required?
Analysis/Testing	N/A	☐ Yes ☒ No

(20) Item No.	(21) Sec. Class.	(22) Qty	(23) Unit	(24) Haz. Mat'l.	(25) Property Tag No. and/or MID No.	(26) Description	(27) Unit Value	Total $
1	UNC	7	EA	N	N/A	Environmental Solid/Liquid	$0.00	$0.00
						Samples		$0.00
						——Last Item——		$0.00
COOLER #1: 3.0 cu ft / 35 lbs						601005		$0.00
COOLER #2: 3.0 cu ft / 45 lbs						601144		$0.00
COOLER #3: 4.0 cu ft / 70 lbs						601314		$0.00
COOLER #4: 3.0 cu ft / 54 lbs						601331		$0.00
COOLER #5: 3.0 cu ft / 47 lbs						601331		$0.00
COOLER #6: 3.0 cu ft / 54 lbs						601310		$0.00
COOLER #7: 3.0 cu ft / 48 lbs						SANDIA SHIPPING ONLY: Please		$0.00
COOLER #8: / lbs						FAX a copy of this Shipper to SMO		$0.00
				1/22/99 OK		at 844-4976. Thanks!		$0.00
							Grand Total	$0.00

(28) Type or print approval name: R. P. Rivera, 7578

Authorizing Signature: [signature]
Manager or delegated authority

I certify that the material being offered for shipment is non hazardous unless noted as hazardous in block 24 and required information is being provided.

(29) Special Approval (International): Signature Org.

(30) Special Approval (Service Ctrs, DOE): Signature Org.

(31) Recipients's Signature/Co. Signature/Co. Date

(32) Contracting or GFP Rep. Signature Date

Received in Shipping: Date 1/22/99 Time 1220

Shipping Service Clerk:

Property Management Rep:

The listed material and accompanying information have been examined and the hazardous material descriptions and all preparations for shipment are certified correct.

Hazardous Material Consultant

Date Shipped or Handcarried:	Routing:	Bill:	No. of Coolers:	Weight:	Dimension:	Packed by:
FEDERAL EX JAN 22 1999		4223 3365 9298 4223 3365 9287 4223 3365 9276 4223 3365 9265 4223 3365 9243 4223 3365 9254	7	353 lbs	22 cu ft	

Survey # 5156
page 3 of 6

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Sandia Radiation Protection Sample Diagnostics Program
Wednesday, January 20, 1999 (10:09:13 AM)

****

LSC Analysis Program - Version: 2.0.002

Batch Number : 93005301
Count Protocol : 7
Client : ER78 1/19/99 1700 A. TUCKER 7523 93005301
Laboratory ID : 6921 - S#411293
Count Date : 20-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 0 - 12
Count Time : 5 minutes
Background cpm : 27.8 +/- 5.41
Background tSIE : 448
Background Eff : .3806
Sample Aliquot : 1 swipe(s)

H-3 MDA = 3.03E+01 dpm/swipe
H-3 CL = 1.44E+01 dpm/swipe

Tritium Sys. Error : 12.9%
Tritium Efficiency : 0.9385 - exp(-0.0029003*tSIE^0.8689)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

Analyzed by: RT Preston 1/20/99 Reviewed by: RT Preston 1/20/99

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	H-3 Activity dpm/swipe	2s Error	Fla
001	1	1.00E+00	1.96E+01	4.12E+00	424	0.365	-2.25E+01	2.90E+01	<CL
002	2	1.00E+00	2.20E+01	4.31E+00	420	0.363	-1.60E+01	2.88E+01	<CL
003	3	1.00E+00	2.16E+01	4.31E+00	418	0.361	-1.72E+01	2.91E+01	<CL
004	4	1.00E+00	2.24E+01	4.38E+00	417	0.360	-1.50E+01	2.91E+01	<CL
005	5	1.00E+00	1.90E+01	4.14E+00	423	0.365	-2.41E+01	2.93E+01	<CL
006	6	1.00E+00	1.82E+01	4.06E+00	424	0.365	-2.63E+01	2.93E+01	<CL
007	7	1.00E+00	2.48E+01	4.66E+00	422	0.364	-8.24E+00	2.88E+01	<CL
008	8	1.00E+00	2.02E+01	4.25E+00	420	0.363	-2.10E+01	2.93E+01	<CL
009	9	1.00E+00	2.14E+01	4.47E+00	422	0.364	-1.76E+01	2.94E+01	<CL
010	10	1.00E+00	2.08E+01	4.31E+00	419	0.362	-1.93E+01	2.93E+01	<CL
011	11	1.00E+00	2.02E+01	4.25E+00	412	0.357	-2.13E+01	2.98E+01	<CL
012	12	1.00E+00	2.06E+01	4.40E+00	415	0.359	-2.00E+01	2.99E+01	<CL
013	13	1.00E+00	2.30E+01	4.75E+00	422	0.364	-1.32E+01	2.96E+01	<CL
014	14	1.00E+00	1.72E+01	4.12E+00	405	0.352	-3.01E+01	3.09E+01	<CL
015	15	1.00E+00	2.28E+01	4.63E+00	415	0.359	-1.39E+01	2.98E+01	<CL
016	16	1.00E+00	1.68E+01	4.08E+00	413	0.358	-3.07E+01	3.05E+01	<CL
017	17	1.00E+00	1.84E+01	4.23E+00	413	0.358	-2.63E+01	3.03E+01	<CL

COPY

****
Sandia Radiation Protection Sample Diagnostics Program
Wednesday, January 20, 1999
****
LSC Analysis Program - Version: 2.0.002

RPSD	Client						Activity		
018	18	1.00E+00	1.92E+01	4.27E+00	410	0.356	-2.41E+01	3.03E+01	<CL

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Allwaste #51567Z

Page 5 of 6

****
Sandia Radiation Protection Sample Diagnostics Program
Wednesday, January 20, 1999 (10:09:13 AM)
****
LSC Analysis Program - Version: 2.0.002

Batch Number : 93005301
Count Protocol : 7
Client : ER78 1/19/99 1700 A. TUCKER 7523 93005301
Laboratory ID : 6921 - S#411293
Count Date : 20-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 20 - 600
Count Time : 5 minutes
Background cpm : 3.4 +/- 1.65
Background tSIE : 448
Background Eff : .978
Sample Aliquot : 1 swipe(s)

Gross Alpha MDA = 4.48E+00 dpm/swipe
Gross Alpha CL = 1.96E+00 dpm/swipe

Alpha Sys. Error : 8.9%
Alpha Efficiency : 0.978 - exp(-0.0106*tSIE^1.2486)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	Gross Alpha Activity dpm/swipe	2s Error	Fla
001	1	1.00E+00	3.20E+00	1.60E+00	424	0.978	-2.04E-01	3.34E+00	<CL
002	2	1.00E+00	1.20E+00	9.80E-01	420	0.978	-2.25E+00	2.89E+00	<CL
003	3	1.00E+00	1.80E+00	1.20E+00	418	0.978	-1.64E+00	3.06E+00	<CL
004	4	1.00E+00	1.60E+00	1.13E+00	417	0.978	-1.84E+00	3.01E+00	<CL
005	5	1.00E+00	2.00E+00	1.26E+00	423	0.978	-1.43E+00	3.11E+00	<CL
006	6	1.00E+00	3.00E+00	1.55E+00	424	0.978	-4.09E-01	3.31E+00	<CL
007	7	1.00E+00	2.40E+00	1.39E+00	422	0.978	-1.02E+00	3.19E+00	<CL
008	8	1.00E+00	2.20E+00	1.33E+00	420	0.978	-1.23E+00	3.15E+00	<CL
009	9	1.00E+00	3.00E+00	1.55E+00	422	0.978	-4.09E-01	3.31E+00	<CL
010	10	1.00E+00	4.00E+00	1.79E+00	419	0.978	6.13E-01	3.57E+00	<CL
011	11	1.00E+00	2.60E+00	1.44E+00	412	0.978	-8.18E-01	3.23E+00	<CL
012	12	1.00E+00	1.40E+00	1.06E+00	415	0.978	-2.04E+00	2.95E+00	<CL
013	13	1.00E+00	3.40E+00	1.65E+00	422	0.978	0.00E+00	3.37E+00	<CL
014	14	1.00E+00	1.60E+00	1.13E+00	405	0.978	-1.84E+00	3.01E+00	<CL
015	15	1.00E+00	1.80E+00	1.20E+00	415	0.978	-1.64E+00	3.06E+00	<CL
016	16	1.00E+00	3.40E+00	1.65E+00	413	0.978	0.00E+00	3.37E+00	<CL
017	17	1.00E+00	3.20E+00	1.60E+00	413	0.978	-2.04E-01	3.34E+00	<CL
018	18	1.00E+00	2.60E+00	1.44E+00	410	0.978	-8.18E-01	3.23E+00	<CL

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Survey # 515672

Page 6 of 6

****
Sandia Radiation Protection Sample Diagnostics Program
Wednesday, January 20, 1999 (10:09:14 AM)
****
LSC Analysis Program - Version: 2.0.002

Batch Number : 93005301
Count Protocol : 7
Client : ER78 1/19/99 1700 A. TUCKER 7523 93005301
Laboratory ID : 6921 - S#411293
Count Date : 20-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 12 - 2000
Count Time : 5 minutes
Background cpm : 46.8 +/- 6.12
Background tSIE : 448
Background Eff : .931
Sample Aliquot : 1 swipe(s)

Gross Beta MDA = 1.59E+01 dpm/swipe
Gross Beta CL = 7.66E+00 dpm/swipe

Beta Sys. Error : 6.3%
Beta Efficiency : 0.9314 - exp(-0.031*tSIE^0.9041)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	Gross Beta Activity dpm/swipe	2s Error	Flag
001	1	1.00E+00	3.42E+01	5.23E+00	424	0.931	-1.35E+01	1.30E+01	<CL
002	2	1.00E+00	4.48E+01	5.99E+00	420	0.931	-2.15E+00	1.31E+01	<CL
003	3	1.00E+00	4.20E+01	5.80E+00	418	0.931	-5.16E+00	1.31E+01	<CL
004	4	1.00E+00	4.34E+01	5.89E+00	417	0.931	-3.65E+00	1.31E+01	<CL
005	5	1.00E+00	4.04E+01	5.68E+00	423	0.931	-6.88E+00	1.31E+01	<CL
006	6	1.00E+00	3.92E+01	5.60E+00	424	0.931	-8.17E+00	1.31E+01	<CL
007	7	1.00E+00	3.96E+01	5.63E+00	422	0.931	-7.74E+00	1.31E+01	<CL
008	8	1.00E+00	3.98E+01	5.64E+00	420	0.931	-7.52E+00	1.31E+01	<CL
009	9	1.00E+00	3.50E+01	5.29E+00	422	0.931	-1.27E+01	1.31E+01	<CL
010	10	1.00E+00	4.04E+01	5.68E+00	419	0.931	-6.88E+00	1.31E+01	<CL
011	11	1.00E+00	4.22E+01	5.81E+00	412	0.931	-4.94E+00	1.31E+01	<CL
012	12	1.00E+00	4.38E+01	5.92E+00	415	0.931	-3.22E+00	1.31E+01	<CL
013	13	1.00E+00	4.10E+01	5.73E+00	422	0.931	-6.23E+00	1.31E+01	<CL
014	14	1.00E+00	4.02E+01	5.67E+00	405	0.931	-7.09E+00	1.31E+01	<CL
015	15	1.00E+00	4.02E+01	5.67E+00	415	0.931	-7.09E+00	1.31E+01	<CL
016	16	1.00E+00	4.46E+01	5.97E+00	413	0.931	-2.36E+00	1.31E+01	<CL
017	17	1.00E+00	4.02E+01	5.67E+00	413	0.931	-7.09E+00	1.31E+01	<CL
018	18	1.00E+00	3.50E+01	5.29E+00	410	0.931	-1.27E+01	1.31E+01	<CL

COPY

Survey Number: S15667

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept.	Date	Time	Duration
ER Site #58	Mike Young #6134	011899	1505	N/A

Purpose	Request #	RWP #	RPIR #
Release the exterior of soil samples only.	N/A	RWP0309	N/A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP-260/#2356	N/A	John P. Kilbane	John P. Kilbane
Bicron Micro Rem #B776L	N/A	N/A	N/A
N/A	N/A	N/A	N/A

#	Item Description/Location	BETA-GAMMA CONTAMINATION Counting Data Attached ☒ Yes ☐ No: %Eff. cpm	20 Bkg cpm	/Radionuclide dpm / 100 cm² (1)	DU (2) T/R/F	ALPHA CONTAMINATION Counting Data Attached ☒ Yes ☐ No: %Eff cpm	N/A Bkg cpm	/Radionuclide dpm / 100 cm² (1)	DU (2) T/RF	RADIATION SURVEY Bkg. 7µrem/hr: µrem/hr (3)	Distance
1	Sample #044109-004 Sample #044109-001	≤80	80	ND	T				R	≤7	Contact
2	Sample #044107-004 Sample #044107-001	≤80	80	ND	T				R	≤7	Contact
3	Sample #044108-004 Sample #044108-001	≤80	80	ND	T				R	≤7	Contact
4	Sample #044195-001 Sample #044195002	≤80	80	ND	T				R	≤7	Contact
5	Sample #044124-001 Sample #044124-002	≤80	80	ND	T				R	≤7	Contact
6	Sample #044123-001 Sample #044123-002	≤80	80	ND	T				R	≤7	Contact
7	Sample # 044122-001 Sample #044122-002	≤80	80	ND	T				R	≤7	Contact
8	Sample #044121-001 Sample #044121-002	≤80	80	ND	T				R	≤7	Contact
9	Sample #044120-001 Sample #044120-002	≤80	80	ND	T				R	≤7	Contact
10	Sample #044119-001 Sample #044119-002	≤80	80	ND	T				R	≤7	Contact
						N					
						A					

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3). Indicate type, of other than gamma (i.e., η or β).

Remarks

COPY

Reviewed by: Date:

****
Sandia Radiation Protection Sample Diagnostics Program
Tuesday, January 19, 1999 (9:11:49 AM)
****
LSC Analysis Program - Version: 2.0.002

2-4
#515667

Batch Number : 93004901
Count Protocol : 9
Client : ER 58 SAMPLES 1/18/99 J.P. KILBANE (7523) 93004901
Laboratory ID : 6921 - S#411293
Count Date : 19-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 0 - 12
Count Time : 5 minutes
Background cpm : 21.6 +/- 4.38
Background tSIE : 449
Background Eff : .3815
Sample Aliquot : 1 swipe(s)

H-3 MDA = 2.68E+01 dpm/swipe
H-3 CL = 1.27E+01 dpm/swipe

Tritium Sys. Error : 12.9%
Tritium Efficiency : 0.9385 - exp(-0.0029003*tSIE^0.8689)

COPY

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

Analyzed by: R Preston 1/19/99 Reviewed by: R Preston 1/19/99

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	H-3 Activity dpm/swipe	2s Error	F
001	1	1.00E+00	2.12E+01	5.00E+00	436	0.373	-1.07E+00	2.53E+01	<
002	2	1.00E+00	2.16E+01	5.12E+00	431	0.370	0.00E+00	2.57E+01	<
003	3	1.00E+00	2.34E+01	5.38E+00	433	0.371	4.85E+00	2.69E+01	<
004	4	1.00E+00	1.66E+01	4.92E+00	431	0.370	-1.35E+01	2.69E+01	<
005	5	1.00E+00	1.86E+01	5.01E+00	441	0.376	-7.97E+00	2.60E+01	<
006	6	1.00E+00	2.26E+01	5.32E+00	434	0.372	2.69E+00	2.65E+01	<
007	7	1.00E+00	2.20E+01	5.46E+00	435	0.372	1.07E+00	2.66E+01	<
008	8	1.00E+00	2.52E+01	5.69E+00	437	0.374	9.64E+00	2.82E+01	<
009	9	1.00E+00	2.34E+01	5.67E+00	432	0.370	4.86E+00	2.78E+01	<
010	10	1.00E+00	1.82E+01	4.61E+00	437	0.374	-9.10E+00	2.53E+01	<

```
**********************************************************************
Sandia Radiation Protection Sample Diagnostics Program
Tuesday, January 19, 1999 (9:11:49 AM)
**********************************************************************
LSC Analysis Program - Version: 2.0.002                          3-4
                                                                 #515667
Batch Number        : 93004901
Count Protocol      : 9
Client              : ER 58 SAMPLES 1/18/99 J.P. KILBANE (7523) 93004901
Laboratory ID       : 6921 - S#411293
Count Date          : 19-Jan-99
Protocol Name       : H3AB -- SWIPE
Region of Interest  : 20 - 600
Count Time          : 5 minutes
Background cpm      : 4.6 +/- 1.92
Background tSIE     : 449
Background Eff      : .978
Sample Aliquot      : 1 swipe(s)

Gross Alpha MDA = 5.12E+00 dpm/swipe
Gross Alpha CL  = 2.29E+00 dpm/swipe

Alpha Sys. Error    : 8.9%
Alpha Efficiency    : 0.978 - exp(-0.0106*tSIE^1.2486)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
ERR : Efficiency <= 0.
```

COPY

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	Gross Alpha Activity dpm/swipe	2s Error	Fl
001	1	1.00E+00	4.40E+00	1.88E+00	436	0.978	-2.04E-01	3.90E+00	<(
002	2	1.00E+00	4.80E+00	1.96E+00	431	0.978	2.04E-01	3.98E+00	<(
003	3	1.00E+00	5.20E+00	2.04E+00	433	0.978	6.13E-01	4.10E+00	<(
004	4	1.00E+00	2.80E+00	1.50E+00	431	0.978	-1.84E+00	3.66E+00	<(
005	5	1.00E+00	3.80E+00	1.74E+00	441	0.978	-8.18E-01	3.82E+00	<(
006	6	1.00E+00	3.80E+00	1.74E+00	434	0.978	-8.18E-01	3.82E+00	<(
007	7	1.00E+00	2.80E+00	1.50E+00	435	0.978	-1.84E+00	3.66E+00	<(
008	8	1.00E+00	4.00E+00	1.79E+00	437	0.978	-6.13E-01	3.85E+00	<(
009	9	1.00E+00	3.40E+00	1.65E+00	432	0.978	-1.23E+00	3.76E+00	<(
010	10	1.00E+00	3.40E+00	1.65E+00	437	0.978	-1.23E+00	3.76E+00	<(

****
Sandia Radiation Protection Sample Diagnostics Program
Tuesday, January 19, 1999 (9:11:50 AM)
****
LSC Analysis Program - Version: 2.0.002

4-4
#515667

Batch Number : 93004901
Count Protocol : 9
Client : ER 58 SAMPLES 1/18/99 J.P. KILBANE (7523) 93004901
Laboratory ID : 6921 - S#411293
Count Date : 19-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 12 - 2000
Count Time : 5 minutes
Background cpm : 42. +/- 5.8
Background tSIE : 449
Background Eff : .931
Sample Aliquot : 1 swipe(s)

Gross Beta MDA = 1.51E+01 dpm/swipe
Gross Beta CL = 7.25E+00 dpm/swipe

Beta Sys. Error : 6.3%
Beta Efficiency : 0.9314 - exp(-0.031*tSIE^0.9041)

COPY

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	Gross Beta Activity dpm/swipe	2s Error	Fl
001	1	1.00E+00	4.60E+01	6.07E+00	436	0.931	4.30E+00	1.30E+01	<C
002	2	1.00E+00	4.46E+01	5.97E+00	431	0.931	2.79E+00	1.28E+01	<C
003	3	1.00E+00	4.08E+01	5.71E+00	433	0.931	-1.29E+00	1.24E+01	<C
004	4	1.00E+00	4.26E+01	5.84E+00	431	0.931	6.45E-01	1.25E+01	<C
005	5	1.00E+00	4.16E+01	5.77E+00	441	0.931	-4.30E-01	1.25E+01	<C
006	6	1.00E+00	4.32E+01	5.88E+00	434	0.931	1.29E+00	1.26E+01	<C
007	7	1.00E+00	4.36E+01	5.91E+00	435	0.931	1.72E+00	1.27E+01	<C
008	8	1.00E+00	4.36E+01	5.91E+00	437	0.931	1.72E+00	1.27E+01	<C
009	9	1.00E+00	4.50E+01	6.00E+00	432	0.931	3.22E+00	1.29E+01	<C
010	10	1.00E+00	3.78E+01	5.50E+00	437	0.931	-4.51E+00	1.24E+01	<C

Features 58OO, 58SS, and 58ZZ

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

SF 2001-COC (6-95)

Internal Lab Batch No. 700659

AR/COC- 06628

Dept. No./Mail Stop: 6655 MS 1148
Project/Task Manager: Mike Young 284-2575
Project Name: Site 8 Borehole VCM
Record Center Code: ER/1332/8/DAT
Logbook Ref No: #190
Service Order No.: CF0180

Date Samples Shipped: 4/25/97
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: RPSD Bldg. 881
SMO Contact/Phone: Doug Salmi 848-0963
Send Report to SMO Kathy Becker

Contract No.: AS2480A
Case No.: 3627.820
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location Tech Area: ER Site 8
Building: N/A Room: N/A

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec.	Gamma Spec. full plan + beta	Lab Sample ID
033102-005	58-GR-001-0-SS	0	8	4-24-97 0905	S	M	500 ml	None	G	SA	X		
033107-006	58-GR-002-040-SA	40'	8	4-24-97 1200	S	M	500 ml	None	G	SA		X	

Reference LOV (available at SMO)

RMMA ☐ Yes ☒ No Ref. No. ____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date ____ QC inits. ____

Sample Tracking (SMO USE)
Date Entered (mm/dd/yy) ____
Entered by: ____

Special Instructions/QC Requirements
- Please send as separate report.
- COC# 06628 releases COC# 06626 and ~~06627~~ 06583. NC
- COC# 06626 has 5 VOC samples and needs immediate attn.

Abnormal Conditions on Receipt (LAB USE)

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Nelson Capitan		NC	IT/6684 284-3307

1. Relinquished by		Org. IT/6684	Date 4/25/97	Time 1155	4. Relinquished by	Org. SMO7578	Date 5/7/97 Time 1545
1. Received by		Org. SMO7578	Date 4/25/97	Time 1155	4. Received by	Org. 6684	Date 5/07/97 Time 1545
2. Relinquished by		Org. SMO7578	Date 4/25/97	Time 1436	5. Relinquished by	Org.	Date Time
2. Received by		Org. SNL 7578	Date 4/25/97	Time 1436	5. Received by	Org.	Date Time
3. Relinquished by		Org. SNL 7578	Date 4/28/97	Time 0825	6. Relinquished by	Org.	Date Time
3. Received by		Org. SMO7578	Date 4/28/97	Time 0825	6. Received by	Org.	Date Time

WHITE - To Accompany Samples, Laboratory Copy **BLUE**- To Accompany Samples, Return to SMO **YELLOW**- SMO Suspense Copy **PINK**- Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

RUSH

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Mike Young
Organization: 6685 MS 1148
Project Location: Site 8 B.H. Vcm
Phone: 284-2575
Date Results Needed: ASAP (4/28/97)
Suspect Isotopes: unk
Other Information: 06628

Hazards/Special Instructions:
COC # 06628 releases COC # 06626 and 06583.

Case # 3622.820

Batch Log Number: 70065-9
Logged By:

Analysis Type:
- LIMS Login
- Results Faxed
- Sample Disposal

☐ Gamma Spec
☐ H-3
☐ Alpha/Beta
☐ Alpha Spec
☐ Total U
☐ Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
033102-005	Soil	4-24-97 0905	500ml	Gamma Spec.	01	< 300	589g	
033107-006	Soil	4-24-97 1200	500 ml	Gamma spec and gross alpha+beta	02	< 300	931g	
LCS	—	unknown	—	Gamma Spec	03	N/A	N/A	

COPY
ORIGINAL FILED IN RECORDS CENTER BY SMO

Relinquished by	[signature]	Date 4/25/97	Time 1436	Received by	[signature]	Date 4/25/97	Time 1436
Relinquished by	[signature]	Date 4/25/97	Time 0825	Received by	[signature]	Date 4/28/97	Time 0825
Relinquished by		Date	Time	Received by		Date	Time
Relinquished by		Date	Time	Received by		Date	Time

Sandia National Laboratories
Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, New Mexico 87185-1132

date: July 21, 1997

to: Ed Mignardot, MS-1148 (6685)

from: Craig D. Brown (Environmental Dimensions Inc.), MS-1132 (7527)

subject: Review of Radiological Data for ER Site 8

I have reviewed the samples noted below for the presence of radioactivity in excess of natural background. Both samples contained no radioactivity greater than background. Analytical results were compared to Canyons Study radiological background concentrations and DU was assumed to be the contaminant of concern.

Customer Sample ID
033102-005
033107-006

Please let me know if you have any questions.

Copy to:
Correspondence File: 97034.doc

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 4-25-97 4:36:01 PM *
****

* Analyzed by: 4/27/97 Reviewed by: JAM 4/28/97 *

Customer : M.YOUNG/MAC (6685/SMO)
Customer Sample ID : 033102-005
Lab Sample ID : 70065901

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 589.000 gram
Sample Date/Time : 4-24-97 9:05:00 AM
Acquire Start Date/Time : 4-25-97 2:53:21 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.87E+00
TH-234	7.95E-01	3.65E-01	5.44E-01
RA-226	1.52E+00	5.81E-01	6.46E-01
PB-214	7.54E-01	1.76E-01	6.01E-02
BI-214	6.73E-01	1.65E-01	6.45E-02
TH-232	8.02E-01	4.05E-01	1.65E-01
RA-228	8.09E-01	2.76E-01	2.11E-01
AC-228	8.15E-01	2.60E-01	1.01E-01
TH-228	7.00E-01	5.62E-01	5.91E-01
RA-224	8.43E-01	3.24E-01	1.09E-01
PB-212	8.87E-01	1.67E-01	4.90E-02
BI-212	1.14E+00	6.16E-01	4.62E-01
TL-208	8.69E-01	1.85E-01	9.38E-02
U-235	Not Detected	---	2.62E-01
TH-231	Not Detected	---	1.07E+01
PA-231	Not Detected	---	1.84E+00
TH-227	Not Detected	---	4.51E-01
RA-223	Not Detected	---	1.81E-01
RN-219	Not Detected	---	5.52E-01
PB-211	Not Detected	---	1.27E+00
TL-207	Not Detected	---	1.88E+01
AM-241	Not Detected	---	2.28E-01
PU-239	Not Detected	---	4.25E+02
NP-237	~~4.14E-01~~	~~2.19E-01~~	2.72E-01 not detected 4/27/97
PA-233	Not Detected	---	7.45E-02
TH-229	Not Detected	---	2.35E-01

[Summary Report] - Sample ID: : 70065901

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.62E-02
AG-110m	Not Detected	---------	9.70E-02
BA-133	Not Detected	---------	6.97E-02
BE-7	2.04E-01	1.50E-01	1.95E-01
CD-109	Not Detected	---------	1.16E+00
CD-115	Not Detected	---------	1.21E-01
CE-139	Not Detected	---------	3.28E-02
CE-141	Not Detected	---------	5.87E-02
CE-144	Not Detected	---------	2.41E-01
CO-56	Not Detected	---------	3.36E-02
CO-57	Not Detected	---------	2.91E-02
CO-58	Not Detected	---------	4.21E-02
CO-60	Not Detected	---------	5.26E-02
CR-51	Not Detected	---------	3.10E-01
CS-134	Not Detected	---------	5.06E-02
CS-137	7.83E-01	2.14E-01	3.11E-02
EU-152	Not Detected	---------	8.78E-02
EU-154	Not Detected	---------	2.63E-01
EU-155	Not Detected	---------	1.38E-01
FE-59	Not Detected	---------	1.06E-01
GD-153	Not Detected	---------	9.93E-02
HG-203	Not Detected	---------	4.06E-02
I-131	Not Detected	---------	4.13E-02
IR-192	Not Detected	---------	3.52E-02
K-40	1.73E+01	2.76E+00	3.74E-01
MN-52	Not Detected	---------	4.71E-02
MN-54	Not Detected	---------	4.56E-02
MO-99	Not Detected	---------	4.27E-01
NA-22	Not Detected	---------	5.42E-02
NA-24	Not Detected	---------	1.53E-01
NB-95	Not Detected	---------	2.39E-01
ND-147	Not Detected	---------	2.94E-01
NI-57	Not Detected	---------	1.18E-01
PB-210	Not Detected	---------	9.35E+00
RU-103	Not Detected	---------	4.08E-02
RU-106	Not Detected	---------	3.82E-01
SB-122	Not Detected	---------	7.36E-02
SB-124	Not Detected	---------	3.89E-02
SB-125	Not Detected	---------	1.20E-01
SN-113	Not Detected	---------	5.24E-02
SR-85	Not Detected	---------	5.05E-02
TA-182	Not Detected	---------	2.08E-01
TA-183	Not Detected	---------	2.30E-01
TC-99m	Not Detected	---------	9.30E-01
TL-201	Not Detected	---------	1.68E-01
XE-133	Not Detected	---------	1.73E-01
Y-88	Not Detected	---------	3.71E-02
ZN-65	Not Detected	---------	1.40E-01
ZR-95	Not Detected	---------	7.51E-02

****
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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [881 Laboratory]

4-27-97 1:37:43 PM

****
*
* Analyzed by: 4/27/97 Reviewed by: JGM 4/28/97 *
****

Customer : M.YOUNG/MAC (6685/SMO)
Customer Sample ID : 033107-006
Lab Sample ID : 70065902

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 931.000 gram
Sample Date/Time : 4-24-97 12:00:00 PM
Acquire Start Date/Time : 4-25-97 4:38:32 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	1.40E+00
TH-234	1.09E+00	3.65E-01	4.12E-01
RA-226	2.52E+00	5.51E-01	5.87E-01
PB-214	1.24E+00	2.06E-01	4.35E-02
BI-214	1.13E+00	1.94E-01	4.45E-02
TH-232	Not Detected	---	1.31E-01
RA-228	3.82E-01	1.73E-01	1.64E-01
AC-228	Not Detected	---	1.75E-01
TH-228	3.48E-01	1.73E-01	4.52E-01
RA-224	4.75E-01	2.00E-01	7.11E-02
PB-212	4.31E-01	7.59E-02	3.21E-02
BI-212	5.47E-01	3.01E-01	2.80E-01
TL-208	4.16E-01	9.94E-02	6.52E-02
U-235	Not Detected	---	1.98E-01
TH-231	Not Detected	---	8.13E+00
PA-231	Not Detected	---	1.30E+00
TH-227	Not Detected	---	2.81E-01
RA-223	Not Detected	---	1.34E-01
RN-219	Not Detected	---	3.80E-01
PB-211	Not Detected	---	8.41E-01
TL-207	Not Detected	---	1.37E+01
AM-241	Not Detected	---	1.72E-01
PU-239	Not Detected	---	3.21E+02
NP-237	~~5.30E-01~~	~~1.80E-01~~	1.94E-01
PA-233	Not Detected	---	5.25E-02
TH-229	Not Detected	---	1.86E-01

Not detected 4/27/97

Ra-226 may be over-estimated due to interference from U-235.

JGM 4/28/97

[Summary Report] - Sample ID: : 70065902

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.76E-02
AG-110m	Not Detected	---	2.78E-02
BA-133	Not Detected	---	5.98E-02
BE-7	Not Detected	---	2.24E-01
CD-109	Not Detected	---	8.84E-01
CD-115	Not Detected	---	8.10E-02
CE-139	Not Detected	---	2.51E-02
CE-141	Not Detected	---	4.36E-02
CE-144	Not Detected	---	1.80E-01
CO-56	Not Detected	---	3.24E-02
CO-57	Not Detected	---	2.22E-02
CO-58	Not Detected	---	3.16E-02
CO-60	Not Detected	---	3.52E-02
CR-51	Not Detected	---	2.07E-01
CS-134	Not Detected	---	4.55E-02
CS-137	Not Detected	---	3.37E-02
EU-152	Not Detected	---	6.73E-02
EU-154	Not Detected	---	1.74E-01
EU-155	Not Detected	---	1.05E-01
FE-59	Not Detected	---	7.34E-02
GD-153	Not Detected	---	7.66E-02
HG-203	Not Detected	---	2.81E-02
I-131	Not Detected	---	2.90E-02
IR-192	Not Detected	---	2.40E-02
K-40	1.36E+01	2.15E+00	2.62E-01
MN-52	Not Detected	---	3.56E-02
MN-54	Not Detected	---	3.34E-02
MO-99	Not Detected	---	3.08E-01
NA-22	Not Detected	---	4.16E-02
NA-24	Not Detected	---	1.29E-01
NB-95	Not Detected	---	1.52E-01
ND-147	Not Detected	---	1.98E-01
NI-57	Not Detected	---	9.54E-02
PB-210	Not Detected	---	7.37E+00
RU-103	Not Detected	---	2.92E-02
RU-106	Not Detected	---	2.50E-01
SB-122	Not Detected	---	4.89E-02
SB-124	Not Detected	---	2.85E-02
SB-125	Not Detected	---	8.05E-02
SN-113	Not Detected	---	3.57E-02
SR-85	Not Detected	---	3.18E-02
TA-182	Not Detected	---	1.77E-01
TA-183	Not Detected	---	1.72E-01
TC-99m	Not Detected	---	6.31E-01
TL-201	Not Detected	---	1.30E-01
XE-133	Not Detected	---	1.30E-01
Y-88	Not Detected	---	2.41E-02
ZN-65	Not Detected	---	1.20E-01
ZR-95	Not Detected	---	5.54E-02

```
**************************************************************************
*                     Sandia National Laboratories                       *
*    Radiation Protection Sample Diagnostics Program [881 Laboratory]    *
*                         4-27-97  1:11:45 PM                            *
**************************************************************************
*                                                                        *
* Analyzed by:          4/27/97       Reviewed by:    4/28/97            *
**************************************************************************
```

Customer : M.YOUNG/MAC (6685/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 70065903

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 4-27-97 12:58:13 PM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	9.06E+03
TH-234	Not Detected	---------	3.54E+03
RA-226	Not Detected	---------	5.90E+03
PB-214	Not Detected	---------	7.96E+02
BI-214	Not Detected	---------	7.42E+02
TH-232	Not Detected	---------	2.34E+03
RA-228	Not Detected	---------	3.37E+03
AC-228	Not Detected	---------	2.05E+03
TH-228	Not Detected	---------	7.67E+04
RA-224	Not Detected	---------	2.37E+03
PB-212	Not Detected	---------	5.70E+03
BI-212	Not Detected	---------	5.72E+04
TL-208	Not Detected	---------	1.21E+04
U-235	Not Detected	---------	1.63E+03
TH-231	Not Detected	---------	5.45E+04
PA-231	Not Detected	---------	1.56E+04
TH-227	Not Detected	---------	2.63E+03
RA-223	Not Detected	---------	1.00E+26
RN-219	Not Detected	---------	6.75E+03
PB-211	Not Detected	---------	1.52E+04
TL-207	Not Detected	---------	2.79E+05
AM-241	8.34E+04	1.40E+04	1.57E+03
PU-239	Not Detected	---------	2.57E+06
NP-237	2.77E+02	1.68E+02	1.13E+03
PA-233	Not Detected	---------	6.84E+02
TH-229	Not Detected	---------	1.40E+03

[Summary Report] - Sample ID: : 70065903

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	4.30E+02
AG-110m	Not Detected	---	1.29E+06
BA-133	Not Detected	---	7.55E+02
BE-7	Not Detected	---	9.31E+16
CD-109	3.61E+05	7.44E+04	1.38E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	3.20E+07
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	4.67E+05
CO-56	Not Detected	---	8.40E+11
CO-57	Not Detected	---	7.89E+04
CO-58	Not Detected	---	5.00E+12
CO-60	7.82E+04	1.08E+04	5.68E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	3.12E+03
CS-137	6.86E+04	9.19E+03	3.52E+02
EU-152	Not Detected	---	7.84E+02
EU-154	Not Detected	---	3.24E+03
EU-155	Not Detected	---	2.19E+03
FE-59	Not Detected	---	1.18E+19
GD-153	Not Detected	---	5.24E+05
HG-203	Not Detected	---	6.25E+17
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.45E+12
K-40	Not Detected	---	1.76E+03
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	8.99E+04
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.32E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
PB-210	Not Detected	---	6.74E+04
RU-103	Not Detected	---	6.17E+20
RU-106	Not Detected	---	2.99E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	2.43E+14
SB-125	Not Detected	---	6.76E+03
SN-113	Not Detected	---	8.09E+08
SR-85	Not Detected	---	4.19E+13
TA-182	Not Detected	---	2.52E+09
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	9.87E+08
ZN-65	Not Detected	---	9.88E+05
ZR-95	Not Detected	---	1.00E+14

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 4-27-97 1:12:46 PM
QA File : C:\GENIEPC\CAMFILES\LCS1.QAF
Analyst : FCD
Sample ID : 70065903
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 4-27-97 12:58:13 PM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.772E-02	2.591E-03	8.341E-02	<	In		>
CS-137 Activity	6.888E-02	1.602E-03	6.862E-02	<			>
CO-60 Activity	7.572E-02	2.973E-03	7.915E-02	<	In		>

OK 9/27/97

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 4/27/97

****
* Sandia Radioactive Sample Diagnostics Program 4-28-1997 *
****
LSC Analysis Program - version 5.3

Batch Number : 70065902
Count Protocol : 13
Client : SITE 8 SOIL (M.YOUNG 6685) 70065902
Laboratory ID : 881-2
Count Date : 27-Apr-97
Protocol Name : H3AB -- SWIPE/SOLID
Region of Interest : 0-12
Count Time : 100.0 minutes
Background cpm : 13.17 +- 1.38
Background tSIE : 255.8
Background Eff : 0.227
Systematic Error : 12.90%
Sample Aliquot : 0.100 g

H-3 MDA = 3.41E+01 pCi/g
H-3 CL = 1.68E+01 pCi/g

H-3 Efficiency = 0.9740 - exp(-0.00047*tSIE^1.1600)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: 4/28/97 Reviewed by: 4/28/97

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity pCi/g	Error	Flag
2	002	33107-6	1.24E+01	8.27E-01	103	0.071	-5.23E+01	1.47E+02	<CL
3	003	33107-6	1.29E+01	7.90E-01	86	0.053	-2.56E+01	1.88E+02	<CL

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program            4-28-1997 *
**********************************************************************
LSC Analysis Program - version 5.3

Batch Number        : 70065902
Count Protocol      : 13
Client              : SITE 8 SOIL  (M.YOUNG 6685)              70065902
Laboratory ID       : 881-2
Count Date          : 27-Apr-97
Protocol Name       : H3AB -- SWIPE/SOLID
Region of Interest  : 20-600
Count Time          : 100.0 minutes
Background cpm      : 5.25 +- 0.46
Background tSIE     : 255.8
Background Eff      : 1.038
Systematic Error    :  8.90%
Sample Aliquot      : 0.100 g

Alpha MDA =  4.75E+00 pCi/g
Alpha CL  =  2.32E+00 pCi/g

Alpha Efficiency = 1.0390 - exp(-0.00990*tSIE^1.1780)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity pCi/g	Error	Flag
2	002	33107-6	4.49E+00	4.24E-01	103	0.942	-3.64E+00	4.54E+00	<CL
3	003	33107-6	4.70E+00	4.34E-01	86	0.886	-2.80E+00	4.78E+00	<CL

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program              4-28-1997 *
**********************************************************************
LSC Analysis Program - version 5.3

Batch Number        : 70065902
Count Protocol      : 13
Client              : SITE 8 SOIL  (M.YOUNG 6685)                70065902
Laboratory ID       : 881-2
Count Date          : 27-Apr-97
Protocol Name       : H3AB -- SWIPE/SOLID
Region of Interest  : 12-2000
Count Time          : 100.0 minutes
Background cpm      : 36.02 +- 1.20
Background tSIE     : 255.8
Background Eff      : 0.839
Systematic Error    :  6.30%
Sample Aliquot      : 0.100 g

Beta MDA =  1.52E+01 pCi/g
Beta CL  =  7.51E+00 pCi/g

Beta Efficiency = 0.8410 - exp(-0.01319*tSIE^1.1040)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity pCi/g	Error	Flag
2	002	33107-6	3.06E+01	1.11E+00	103	0.731	-3.34E+01	1.63E+01	<CL
3	003	33107-6	3.10E+01	1.11E+00	86	0.676	-3.35E+01	1.75E+01	<CL

Internal Lab

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Batch No. 900194 SAR/WR No.

AR/COC 601348

Dept. No./Mail Stop:	6134/1148	Date Samples Shipped: [redacted] SMO Use: 1/27/99		Contract No.: ~~AJ-2480A~~ BCR	
Project/Task Manager:	Caroline Byrd	Carrier/Waybill No.: [redacted]		Case No.:	7213.220600
Project Name:	Foothill Test Area S'(le 8/58	Lab Contact:	Fernando	SMO Authorization:	
Record Center Code:	ER/1333/58/DAT	Lab Destination:	AMIR	Bill To:	Sandia National Laboratories
Logbook Ref. No.:		SMO Contact/Phone:	Doug Salmi/844-3110	Supplier Services Dept.:	
Service Order No.	CFO655	Send Report to SMO:	Robert Rivera	P.O. Box 5800 MS 0154	
Location	NA				

RUSH

COPY

Reference LOV(available at SMO)

Lab Use

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
044265-004	S58BH1-GR-001-6-S	6	58	12699/922	s	M	500ml	NONE	G	SA	Gamma Spec	[redacted]
044266-004	S58BH1-GR-002-10-S	10	58	12699/937	s	M	500ml	NONE	G	SA	Gamma Spec	
044267-004	S58BH1-GR-003-15-S	15	58	12699/956	s	M	500ml	NONE	G	SA	Gamma Spec	
044273-004	S58BH1-GR-103-0-SD	0	58	12699/956	S	M	500ml	NONE	G	SD DU	Gamma Spec	
044274-004	S58B-GR-101-5-S	5	58	12699/1130	S	M	500ml	NONE	G	SA	Gamma Spec	
044275-004	S58B-GR-102-10-S	10	58	12699/1231	S	M	500ml	NONE	G	SA	Gamma Spec	

RMMA	☒ Yes ☐ No Ref. No.	[redacted]	Special Instructions/QC Requirements
Sample Disposal	☒ Return to Client ☒ Disposal by lab		EDD ☐ Yes ☒ No
Turnaround Time	☐ Normal ☒ Rush		Raw Data Package ☐ Yes ☒ No
	Required Report Date		This COC releases COC 601347 and 601351

	Name	Signature	Init	Company/Organization/Phone
Sample Team Members	Chris Catechis	Ch. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	Bill Gibson	BG	MDM/6131/235-3841

Please list as separate report.

1.Relinquished by	Ch. Catechis	Org. 6131	Date 1/27/99	Time 1505	4.Relinquished by	Org.	Date	Time
1. Received by	Robert Rivera (SMO)	Org. 7578	Date 1/27/99	Time 1505	4. Received by	Org.	Date	Time
2.Relinquished by	Robert Rivera (SMO)	Org. 7578	Date 1/27/99	Time 1517	5.Relinquished by	Org.	Date	Time
2. Received by		Org. 7578	Date 1/27/99	Time 1514	5. Received by	Org.	Date	Time
3.Relinquished by	for GLS	Org. SNL7578	Date 1/28/99	Time 1010	6.Relinquished by	Org.	Date	Time
3. Received by	Robert Rivera (SMO)	Org. 7578	Date 1/28/99	Time 1010	6. Received by	Org.	Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Site 8/58
Phone: 845-0868 (SMO)
Date Results Needed: Rush 1/28/99
Suspect Isotopes: UNK
Other Information: 7213, 2206

Hazards/Special Instructions:

RUSH

COC # 601348

Batch Log Number: 900194
Logged By:

Analysis Type:
- ☑ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044265-004	Soil	12699/922	500 ml	Gamma Spec	01	L300	918g	
044266-004		12699/937			02	L300	882g	
044267-004		12699/956			03	L300	1023g	
044273-004		12699/956			04	L300	1033g	
044274-004		12699/1130			05	L300	845g	
044275-004		12699/1231			06	L300	787g	
				LCS	07,08	N/A	N/A	

Relinquished by Robert G. Rivera (SMO) 7578 Date 1/27/99 Time 1512 Received by _____ Date 1/27/99 Time 1512
Relinquished by _____ Date 1/28/99 Time 1010 Received by Robert G. Rivera Date 1/28/99 Time 1010
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 8:32:11 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044265-004
Lab Sample ID : 90019401

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 918.000 gram
Sample Date/Time : 1/26/99 9:22:00 AM
Acquire Start Date/Time : 1/27/99 3:32:04 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.08E-001
RA-226	1.47E+000	7.24E-001	4.16E-001
PB-214	6.22E-001	1.21E-001	3.51E-002
BI-214	5.72E-001	2.72E-001	3.52E-002
PB-210	Not Detected	---	2.96E+001
TH-232	5.75E-001	3.24E-001	1.18E-001
RA-228	6.51E-001	2.35E-001	1.11E-001
AC-228	5.62E-001	1.65E-001	6.12E-002
TH-228	7.18E-001	4.61E-001	3.39E-001
RA-224	6.51E-001	1.63E-001	5.53E-002
PB-212	6.56E-001	1.18E-001	3.03E-002
BI-212	7.64E-001	4.00E-001	2.09E-001
TL-208	5.87E-001	1.33E-001	4.59E-002
U-235	Not Detected	---	1.77E-001
TH-231	Not Detected	---	1.15E+000
PA-231	Not Detected	---	1.03E+000
TH-227	Not Detected	---	2.80E-001
RA-223	Not Detected	---	1.64E-001
RN-219	Not Detected	---	2.66E-001
PB-211	Not Detected	---	6.12E-001
TL-207	Not Detected	---	9.77E+000
AM-241	Not Detected	---	3.88E-001
PU-239	Not Detected	---	3.29E+002
NP-237	~~4.67E-001~~	~~2.59E-001~~	2.43E-001 Not detected
PA-233	Not Detected	---	4.25E-002
TH-229	Not Detected	---	2.10E-001

1/28/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019401

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.62E-002
AG-110m	Not Detected	---	2.16E-002
BA-133	Not Detected	---	4.61E-002
BE-7	Not Detected	---	1.84E-001
CD-109	Not Detected	---	8.23E-001
CD-115	Not Detected	---	7.21E-002
CE-139	Not Detected	---	2.24E-002
CE-141	Not Detected	---	3.97E-002
CE-144	Not Detected	---	1.83E-001
CO-56	Not Detected	---	2.30E-002
CO-57	Not Detected	---	2.33E-002
CO-58	Not Detected	---	2.24E-002
CO-60	Not Detected	---	2.54E-002
CR-51	Not Detected	---	1.66E-001
CS-134	Not Detected	---	2.72E-002
CS-137	Not Detected	---	2.40E-002
EU-152	Not Detected	---	6.92E-002
EU-154	Not Detected	---	1.28E-001
EU-155	Not Detected	---	1.17E-001
FE-59	Not Detected	---	5.32E-002
GD-153	Not Detected	---	8.86E-002
HG-203	Not Detected	---	2.29E-002
I-131	Not Detected	---	2.23E-002
IR-192	Not Detected	---	2.01E-002
K-40	1.55E+001	2.24E+000	1.91E-001
MN-52	Not Detected	---	2.48E-002
MN-54	Not Detected	---	2.63E-002
MO-99	Not Detected	---	2.32E-001
NA-22	Not Detected	---	2.86E-002
NA-24	Not Detected	---	9.72E-002
NB-95	Not Detected	---	1.53E-001
ND-147	Not Detected	---	1.52E-001
NI-57	Not Detected	---	4.70E-002
RU-103	Not Detected	---	2.05E-002
RU-106	Not Detected	---	1.93E-001
SB-122	Not Detected	---	3.95E-002
SB-124	Not Detected	---	2.09E-002
SB-125	Not Detected	---	6.17E-002
SN-113	Not Detected	---	2.71E-002
SR-85	Not Detected	---	2.63E-002
TA-182	Not Detected	---	1.14E-001
TA-183	Not Detected	---	3.91E-001
TC-99m	Not Detected	---	7.38E-001
TL-201	Not Detected	---	1.85E-001
XE-133	Not Detected	---	1.60E-001
Y-88	Not Detected	---	1.89E-002
ZN-65	Not Detected	---	7.43E-002
ZR-95	Not Detected	---	3.95E-002

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

1/28/99 8:40:40 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044266-004
Lab Sample ID : 90019402

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 882.000 gram
Sample Date/Time : 1/26/99 9:37:00 AM
Acquire Start Date/Time : 1/27/99 5:24:09 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.19E-001
RA-226	1.36E+000	6.15E-001	4.52E-001
PB-214	6.00E-001	1.87E-001	3.58E-002
BI-214	5.69E-001	2.06E-001	3.61E-002
PB-210	Not Detected	---	2.92E+001
TH-232	6.67E-001	3.42E-001	9.78E-002
RA-228	6.22E-001	2.04E-001	1.10E-001
AC-228	6.19E-001	1.79E-001	6.54E-002
TH-228	6.61E-001	2.10E-001	3.94E-001
RA-224	6.52E-001	1.64E-001	5.03E-002
PB-212	6.72E-001	1.17E-001	3.30E-002
BI-212	6.59E-001	3.80E-001	2.42E-001
TL-208	6.29E-001	1.45E-001	4.82E-002
U-235	9.43E-002	1.47E-001	1.87E-001
TH-231	Not Detected	---	1.18E+000
PA-231	Not Detected	---	1.07E+000
TH-227	Not Detected	---	2.91E-001
RA-223	Not Detected	---	1.67E-001
RN-219	Not Detected	---	2.80E-001
PB-211	Not Detected	---	6.45E-001
TL-207	Not Detected	---	1.04E+001
AM-241	Not Detected	---	3.96E-001
PU-239	Not Detected	---	3.29E+002
NP-237	Not Detected	---	2.39E-001
PA-233	Not Detected	---	4.27E-002
TH-229	Not Detected	---	2.13E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019402

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.62E-002
AG-110m	Not Detected	---	2.42E-002
BA-133	Not Detected	---	4.73E-002
BE-7	Not Detected	---	1.83E-001
CD-109	Not Detected	---	8.10E-001
CD-115	Not Detected	---	7.64E-002
CE-139	Not Detected	---	2.31E-002
CE-141	Not Detected	---	4.13E-002
CE-144	Not Detected	---	1.83E-001
CO-56	Not Detected	---	2.49E-002
CO-57	Not Detected	---	2.32E-002
CO-58	Not Detected	---	2.50E-002
CO-60	Not Detected	---	2.72E-002
CR-51	Not Detected	---	1.80E-001
CS-134	Not Detected	---	2.71E-002
CS-137	2.44E-002	2.47E-002	1.63E-002
EU-152	Not Detected	---	6.97E-002
EU-154	Not Detected	---	1.27E-001
EU-155	Not Detected	---	1.18E-001
FE-59	Not Detected	---	5.30E-002
GD-153	Not Detected	---	8.86E-002
HG-203	Not Detected	---	2.38E-002
I-131	Not Detected	---	2.34E-002
IR-192	Not Detected	---	2.04E-002
K-40	1.52E+001	2.19E+000	1.91E-001
MN-52	Not Detected	---	2.62E-002
MN-54	Not Detected	---	2.66E-002
MO-99	Not Detected	---	2.36E-001
NA-22	Not Detected	---	3.03E-002
NA-24	Not Detected	---	1.07E-001
NB-95	Not Detected	---	1.63E-001
ND-147	Not Detected	---	1.56E-001
NI-57	Not Detected	---	6.79E-002
RU-103	Not Detected	---	2.07E-002
RU-106	Not Detected	---	2.09E-001
SB-122	Not Detected	---	4.21E-002
SB-124	Not Detected	---	2.13E-002
SB-125	Not Detected	---	6.50E-002
SN-113	Not Detected	---	2.79E-002
SR-85	Not Detected	---	2.71E-002
TA-182	Not Detected	---	1.20E-001
TA-183	Not Detected	---	4.06E-001
TC-99m	Not Detected	---	9.39E-001
TL-201	Not Detected	---	1.87E-001
XE-133	Not Detected	---	1.70E-001
Y-88	Not Detected	---	1.78E-002
ZN-65	Not Detected	---	7.67E-002
ZR-95	Not Detected	---	4.08E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 7:32:33 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044267-004
Lab Sample ID : 90019403

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 1023.000 gram
Sample Date/Time : 1/26/99 9:56:00 AM
Acquire Start Date/Time : 1/28/99 5:52:18 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	5.66E-001
RA-226	1.36E+000	6.71E-001	4.40E-001
PB-214	5.64E-001	1.09E-001	3.20E-002
BI-214	4.72E-001	7.84E-002	3.29E-002
PB-210	Not Detected	---------	2.53E+001
TH-232	5.14E-001	2.89E-001	9.99E-002
RA-228	6.39E-001	2.15E-001	1.03E-001
AC-228	5.52E-001	1.50E-001	6.14E-002
TH-228	4.77E-001	4.65E-001	3.50E-001
RA-224	6.41E-001	1.56E-001	2.23E-002
PB-212	5.38E-001	9.89E-002	2.80E-002
BI-212	6.89E-001	1.39E-001	2.17E-001
TL-208	5.27E-001	1.06E-001	4.49E-002
U-235	9.50E-002	1.31E-001	1.66E-001
TH-231	Not Detected	---------	1.08E+000
PA-231	Not Detected	---------	9.83E-001
TH-227	Not Detected	---------	2.50E-001
RA-223	Not Detected	---------	1.56E-001
RN-219	Not Detected	---------	2.60E-001
PB-211	Not Detected	---------	5.83E-001
TL-207	Not Detected	---------	9.41E+000
AM-241	Not Detected	---------	3.43E-001
PU-239	Not Detected	---------	3.05E+002
NP-237	~~4.15E-001~~	~~1.97E-001~~	2.41E-001 Not detected
PA-233	Not Detected	---------	4.04E-002
TH-229	Not Detected	---------	1.95E-001

1/28/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019403

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.40E-002
AG-110m	Not Detected	---	2.04E-002
BA-133	Not Detected	---	4.17E-002
BE-7	Not Detected	---	1.75E-001
CD-109	Not Detected	---	8.19E-001
CD-115	Not Detected	---	7.67E-002
CE-139	Not Detected	---	2.09E-002
CE-141	Not Detected	---	3.70E-002
CE-144	Not Detected	---	1.61E-001
CO-56	Not Detected	---	2.31E-002
CO-57	Not Detected	---	2.17E-002
CO-58	Not Detected	---	2.12E-002
CO-60	Not Detected	---	2.65E-002
CR-51	Not Detected	---	1.58E-001
CS-134	Not Detected	---	2.44E-002
CS-137	Not Detected	---	2.28E-002
EU-152	Not Detected	---	6.47E-002
EU-154	Not Detected	---	1.16E-001
EU-155	Not Detected	---	1.09E-001
FE-59	Not Detected	---	4.93E-002
GD-153	Not Detected	---	8.05E-002
HG-203	Not Detected	---	2.20E-002
I-131	Not Detected	---	2.26E-002
IR-192	Not Detected	---	1.81E-002
K-40	1.65E+001	2.38E+000	1.69E-001
MN-52	Not Detected	---	2.40E-002
MN-54	Not Detected	---	2.27E-002
MO-99	Not Detected	---	2.47E-001
NA-22	Not Detected	---	2.91E-002
NA-24	Not Detected	---	1.78E-001
NB-95	Not Detected	---	1.55E-001
ND-147	Not Detected	---	1.42E-001
NI-57	Not Detected	---	8.23E-002
RU-103	Not Detected	---	1.86E-002
RU-106	Not Detected	---	1.85E-001
SB-122	Not Detected	---	4.08E-002
SB-124	Not Detected	---	2.00E-002
SB-125	Not Detected	---	5.73E-002
SN-113	Not Detected	---	2.51E-002
SR-85	Not Detected	---	2.45E-002
TA-182	Not Detected	---	1.10E-001
TA-183	Not Detected	---	3.72E-001
TC-99m	Not Detected	---	3.41E+000
TL-201	Not Detected	---	1.96E-001
XE-133	Not Detected	---	1.84E-001
Y-88	Not Detected	---	1.54E-002
ZN-65	Not Detected	---	7.10E-002
ZR-95	Not Detected	---	3.80E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:11:23 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044273-004
Lab Sample ID : 90019404

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 1033.000 gram
Sample Date/Time : 1/26/99 9:56:00 AM
Acquire Start Date/Time : 1/28/99 6:05:52 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.42E-001
RA-226	1.27E+000	5.94E-001	3.99E-001
PB-214	5.43E-001	1.13E-001	3.83E-002
BI-214	4.65E-001	1.11E-001	3.76E-002
PB-210	Not Detected	---------	3.36E+000
TH-232	5.12E-001	2.86E-001	1.11E-001
RA-228	5.55E-001	5.65E-001	1.27E-001
AC-228	5.39E-001	9.67E-002	6.72E-002
TH-228	6.11E-001	2.21E-001	3.83E-001
RA-224	Not Detected	---------	2.03E-001
PB-212	5.42E-001	9.84E-002	2.99E-002
BI-212	7.52E-001	4.49E-001	2.70E-001
TL-208	5.03E-001	2.96E-001	5.85E-002
U-235	Not Detected	---------	1.61E-001
TH-231	Not Detected	---------	8.37E-001
PA-231	Not Detected	---------	1.08E+000
TH-227	Not Detected	---------	2.65E-001
RA-223	Not Detected	---------	1.01E-001
RN-219	Not Detected	---------	3.04E-001
PB-211	Not Detected	---------	6.89E-001
TL-207	Not Detected	---------	1.25E+001
AM-241	Not Detected	---------	1.21E-001
PU-239	Not Detected	---------	2.66E+002
NP-237	~~4.95E-001~~	~~2.61E-001~~	1.57E-001 Not detected 1/28/99
PA-233	Not Detected	---------	4.49E-002
TH-229	Not Detected	---------	1.48E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019404

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.32E-002
AG-110m	Not Detected	---	2.63E-002
BA-133	Not Detected	---	4.56E-002
BE-7	Not Detected	---	1.92E-001
CD-109	Not Detected	---	7.06E-001
CD-115	Not Detected	---	8.87E-002
CE-139	Not Detected	---	2.08E-002
CE-141	Not Detected	---	3.60E-002
CE-144	Not Detected	---	1.42E-001
CO-56	Not Detected	---	2.63E-002
CO-57	Not Detected	---	1.82E-002
CO-58	Not Detected	---	2.55E-002
CO-60	Not Detected	---	3.27E-002
CR-51	Not Detected	---	1.94E-001
CS-134	Not Detected	---	4.25E-002
CS-137	Not Detected	---	2.84E-002
EU-152	Not Detected	---	5.46E-002
EU-154	Not Detected	---	1.53E-001
EU-155	Not Detected	---	8.49E-002
FE-59	Not Detected	---	6.73E-002
GD-153	Not Detected	---	6.03E-002
HG-203	Not Detected	---	2.46E-002
I-131	Not Detected	---	2.62E-002
IR-192	Not Detected	---	2.17E-002
K-40	1.54E+001	2.35E+000	3.52E-001
MN-52	Not Detected	---	3.32E-002
MN-54	Not Detected	---	1.40E-002
MO-99	Not Detected	---	3.18E-001
NA-22	Not Detected	---	3.95E-002
NA-24	Not Detected	---	1.98E-001
NB-95	Not Detected	---	1.70E-001
ND-147	Not Detected	---	1.88E-001
NI-57	Not Detected	---	9.91E-002
RU-103	Not Detected	---	2.34E-002
RU-106	Not Detected	---	2.32E-001
SB-122	Not Detected	---	5.39E-002
SB-124	Not Detected	---	2.54E-002
SB-125	Not Detected	---	6.67E-002
SN-113	Not Detected	---	3.05E-002
SR-85	Not Detected	---	2.86E-002
TA-182	Not Detected	---	1.38E-001
TA-183	Not Detected	---	1.32E-001
TC-99m	Not Detected	---	3.39E+000
TL-201	Not Detected	---	1.01E-001
XE-133	Not Detected	---	1.13E-001
Y-88	Not Detected	---	2.19E-002
ZN-65	Not Detected	---	9.41E-002
ZR-95	Not Detected	---	4.92E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:22:46 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044274-004
Lab Sample ID : 90019405

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 842.000 gram
Sample Date/Time : 1/26/99 11:30:00 AM
Acquire Start Date/Time : 1/28/99 7:33:47 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.59E-001
RA-226	4.60E-001	3.10E-001	3.73E-001
PB-214	2.92E-001	7.62E-002	2.97E-002
BI-214	2.58E-001	7.04E-002	3.00E-002
PB-210	Not Detected	---------	2.29E+001
TH-232	3.41E-001	2.16E-001	9.42E-002
RA-228	2.93E-001	1.28E-001	8.67E-002
AC-228	2.86E-001	1.25E-001	5.00E-002
TH-228	3.64E-001	1.77E-001	3.10E-001
RA-224	3.22E-001	9.44E-002	5.07E-002
PB-212	3.22E-001	7.24E-002	2.58E-002
BI-212	2.16E-001	2.03E-001	1.98E-001
TL-208	2.52E-001	2.06E-001	3.80E-002
U-235	Not Detected	---------	1.41E-001
TH-231	Not Detected	---------	8.86E-001
PA-231	Not Detected	---------	8.53E-001
TH-227	Not Detected	---------	2.14E-001
RA-223	Not Detected	---------	1.33E-001
RN-219	Not Detected	---------	2.18E-001
PB-211	Not Detected	---------	4.98E-001
TL-207	Not Detected	---------	8.06E+000
AM-241	Not Detected	---------	3.06E-001
PU-239	Not Detected	---------	2.59E+002
NP-237	Not Detected	---------	2.23E-001
PA-233	Not Detected	---------	3.41E-002
TH-229	Not Detected	---------	1.60E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019405

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.10E-002
AG-110m	Not Detected	---	1.66E-002
BA-133	Not Detected	---	3.41E-002
BE-7	Not Detected	---	1.50E-001
CD-109	Not Detected	---	7.57E-001
CD-115	Not Detected	---	6.70E-002
CE-139	Not Detected	---	1.83E-002
CE-141	Not Detected	---	3.12E-002
CE-144	Not Detected	---	1.42E-001
CO-56	Not Detected	---	2.14E-002
CO-57	Not Detected	---	1.89E-002
CO-58	Not Detected	---	1.92E-002
CO-60	Not Detected	---	2.27E-002
CR-51	Not Detected	---	1.53E-001
CS-134	Not Detected	---	2.04E-002
CS-137	Not Detected	---	1.87E-002
EU-152	Not Detected	---	5.64E-002
EU-154	Not Detected	---	9.93E-002
EU-155	Not Detected	---	8.97E-002
FE-59	Not Detected	---	4.49E-002
GD-153	Not Detected	---	6.55E-002
HG-203	Not Detected	---	1.91E-002
I-131	Not Detected	---	1.99E-002
IR-192	Not Detected	---	1.63E-002
K-40	9.41E+000	1.44E+000	1.82E-001
MN-52	Not Detected	---	2.31E-002
MN-54	Not Detected	---	2.04E-002
MO-99	Not Detected	---	2.24E-001
NA-22	Not Detected	---	2.55E-002
NA-24	Not Detected	---	1.65E-001
NB-95	Not Detected	---	1.33E-001
ND-147	Not Detected	---	1.31E-001
NI-57	Not Detected	---	7.05E-002
RU-103	Not Detected	---	1.68E-002
RU-106	Not Detected	---	1.86E-001
SB-122	Not Detected	---	3.80E-002
SB-124	Not Detected	---	1.69E-002
SB-125	Not Detected	---	5.12E-002
SN-113	Not Detected	---	2.37E-002
SR-85	Not Detected	---	2.21E-002
TA-182	Not Detected	---	8.58E-002
TA-183	Not Detected	---	3.37E-001
TC-99m	Not Detected	---	3.00E+000
TL-201	Not Detected	---	1.61E-001
XE-133	Not Detected	---	1.53E-001
Y-88	Not Detected	---	1.60E-002
ZN-65	Not Detected	---	5.91E-002
ZR-95	Not Detected	---	3.17E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:41:55 AM

Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044275-004
Lab Sample ID : 90019406

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 787.000 gram
Sample Date/Time : 1/26/99 12:31:00 PM
Acquire Start Date/Time : 1/28/99 7:48:01 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.16E-001
RA-226	5.91E-001	5.41E-001	3.89E-001
PB-214	2.99E-001	8.69E-002	3.56E-002
BI-214	2.33E-001	8.50E-002	4.25E-002
PB-210	Not Detected	---------	3.62E+000
TH-232	4.13E-001	2.54E-001	1.34E-001
RA-228	3.78E-001	2.55E-001	1.46E-001
AC-228	3.37E-001	1.60E-001	7.55E-002
TH-228	5.28E-001	1.40E-001	3.95E-001
RA-224	Not Detected	---------	2.23E-001
PB-212	3.83E-001	8.12E-002	3.07E-002
BI-212	5.03E-001	3.32E-001	2.15E-001
TL-208	3.71E-001	1.33E-001	5.28E-002
U-235	Not Detected	---------	1.52E-001
TH-231	Not Detected	---------	7.95E-001
PA-231	Not Detected	---------	1.02E+000
TH-227	Not Detected	---------	2.60E-001
RA-223	Not Detected	---------	9.86E-002
RN-219	Not Detected	---------	3.05E-001
PB-211	Not Detected	---------	7.21E-001
TL-207	Not Detected	---------	1.28E+001
AM-241	Not Detected	---------	1.18E-001
PU-239	Not Detected	---------	2.62E+002
NP-237	Not Detected	---------	1.43E-001
PA-233	Not Detected	---------	4.57E-002
TH-229	Not Detected	---------	1.39E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90019406

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.37E-002
AG-110m	Not Detected	---	2.51E-002
BA-133	Not Detected	---	4.10E-002
BE-7	Not Detected	---	2.00E-001
CD-109	Not Detected	---	6.52E-001
CD-115	Not Detected	---	9.06E-002
CE-139	Not Detected	---	1.95E-002
CE-141	Not Detected	---	3.41E-002
CE-144	Not Detected	---	1.34E-001
CO-56	Not Detected	---	2.97E-002
CO-57	Not Detected	---	1.72E-002
CO-58	Not Detected	---	2.78E-002
CO-60	Not Detected	---	3.11E-002
CR-51	Not Detected	---	1.87E-001
CS-134	Not Detected	---	3.89E-002
CS-137	Not Detected	---	2.64E-002
EU-152	Not Detected	---	5.16E-002
EU-154	Not Detected	---	1.55E-001
EU-155	Not Detected	---	8.03E-002
FE-59	Not Detected	---	6.86E-002
GD-153	Not Detected	---	5.64E-002
HG-203	Not Detected	---	2.20E-002
I-131	Not Detected	---	2.71E-002
IR-192	Not Detected	---	2.22E-002
K-40	1.23E+001	2.03E+000	4.31E-001
MN-52	Not Detected	---	3.59E-002
MN-54	Not Detected	---	3.11E-002
MO-99	Not Detected	---	3.42E-001
NA-22	Not Detected	---	3.84E-002
NA-24	Not Detected	---	2.25E-001
NB-95	Not Detected	---	1.66E-001
ND-147	Not Detected	---	1.97E-001
NI-57	Not Detected	---	1.08E-001
RU-103	Not Detected	---	2.39E-002
RU-106	Not Detected	---	2.42E-001
SB-122	Not Detected	---	5.44E-002
SB-124	Not Detected	---	2.67E-002
SB-125	Not Detected	---	6.60E-002
SN-113	Not Detected	---	3.01E-002
SR-85	Not Detected	---	3.10E-002
TA-182	Not Detected	---	1.32E-001
TA-183	Not Detected	---	1.27E-001
TC-99m	Not Detected	---	2.86E+000
TL-201	Not Detected	---	9.14E-002
XE-133	Not Detected	---	1.05E-001
Y-88	Not Detected	---	2.05E-002
ZN-65	Not Detected	---	9.08E-002
ZR-95	Not Detected	---	5.15E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:25:49 AM

* Analyzed by: 1/28/99 Reviewed by: 1/28/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90019407

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/28/99 9:15:34 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 606 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	4.19E+003
RA-226	Not Detected	---------	5.72E+003
PB-214	Not Detected	---------	6.37E+002
BI-214	Not Detected	---------	5.71E+002
PB-210	Not Detected	---------	2.74E+005
TH-232	Not Detected	---------	1.90E+003
RA-228	Not Detected	---------	2.18E+003
AC-228	Not Detected	---------	1.33E+003
TH-228	Not Detected	---------	1.23E+005
RA-224	Not Detected	---------	5.36E+003
PB-212	Not Detected	---------	9.18E+003
BI-212	Not Detected	---------	7.11E+004
TL-208	Not Detected	---------	1.68E+004
U-235	Not Detected	---------	1.54E+003
TH-231	Not Detected	---------	9.67E+003
PA-231	Not Detected	---------	1.30E+004
TH-227	Not Detected	---------	2.37E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	5.32E+003
PB-211	Not Detected	---------	1.20E+004
TL-207	Not Detected	---------	1.93E+005
AM-241	8.07E+004	1.51E+004	2.93E+003
PU-239	Not Detected	---------	2.73E+006
NP-237	Not Detected	---------	2.15E+003
PA-233	Not Detected	---------	5.38E+002
TH-229	Not Detected	---------	1.76E+003

[Summary Report] - Sample ID: : 90019407

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	2.77E+002
AG-110m	Not Detected	---	6.08E+006
BA-133	Not Detected	---	6.82E+002
BE-7	Not Detected	---	3.17E+020
CD-109	Not Detected	---	6.52E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	8.16E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.40E+006
CO-56	Not Detected	---	1.78E+014
CO-57	Not Detected	---	4.54E+005
CO-58	Not Detected	---	1.82E+015
CO-60	8.20E+004	1.11E+004	4.00E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.08E+003
CS-137	7.09E+004	9.42E+003	2.60E+002
EU-152	Not Detected	---	9.59E+002
EU-154	Not Detected	---	2.37E+003
EU-155	Not Detected	---	3.32E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	4.06E+006
HG-203	Not Detected	---	7.52E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	4.84E+014
K-40	Not Detected	---	1.40E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	2.50E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.78E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	7.58E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	2.85E+017
SB-125	Not Detected	---	8.43E+003
SN-113	Not Detected	---	2.99E+010
SR-85	Not Detected	---	3.09E+016
TA-182	Not Detected	---	7.61E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	4.39E+010
ZN-65	Not Detected	---	3.95E+006
ZR-95	Not Detected	---	6.57E+016

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 1/28/99 9:25:51 AM
QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 90019407
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/28/99 9:15:34 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.190E-002	4.074E-003	8.069E-002	<	:	:	: >
CS-137 Activity	7.057E-002	1.981E-003	7.094E-002	<	:	:	: >
CO-60 Activity	7.854E-002	2.171E-003	8.045E-002	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 1/28/99

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/28/99 9:39:28 AM

Analyzed by: 1/28/99 Reviewed by: KA 1/28/98

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90019408

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/28/99 9:29:14 AM
Detector Name : LAB03
Elapsed Live/Real Time : 600 / 606 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.92E+003
RA-226	Not Detected	---	5.97E+003
PB-214	Not Detected	---	7.64E+002
BI-214	Not Detected	---	6.94E+002
PB-210	Not Detected	---	4.59E+004
TH-232	Not Detected	---	2.35E+003
RA-228	Not Detected	---	3.15E+003
AC-228	Not Detected	---	1.82E+003
TH-228	Not Detected	---	1.47E+005
RA-224	Not Detected	---	4.11E+003
PB-212	Not Detected	---	9.71E+003
BI-212	Not Detected	---	9.95E+004
TL-208	Not Detected	---	2.15E+004
U-235	Not Detected	---	1.45E+003
TH-231	Not Detected	---	6.97E+003
PA-231	Not Detected	---	1.50E+004
TH-227	Not Detected	---	2.49E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.69E+003
PB-211	Not Detected	---	1.52E+004
TL-207	Not Detected	---	2.64E+005
AM-241	8.76E+004	1.48E+004	1.22E+003
PU-239	Not Detected	---	2.33E+006
NP-237	Not Detected	---	1.34E+003
PA-233	Not Detected	---	6.76E+002
TH-229	Not Detected	---	1.25E+003

[Summary Report] - Sample ID: : 90019408

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.79E+002
AG-110m	Not Detected	---------	8.03E+006
BA-133	Not Detected	---------	8.26E+002
BE-7	Not Detected	---------	3.76E+020
CD-109	3.53E+005	3.53E+005	2.99E+005
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	7.99E+008
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	2.00E+006
CO-56	Not Detected	---------	2.38E+014
CO-57	Not Detected	---------	3.77E+005
CO-58	Not Detected	---------	2.24E+015
CO-60	8.31E+004	1.17E+004	4.98E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	5.30E+003
CS-137	7.16E+004	9.58E+003	2.97E+002
EU-152	Not Detected	---------	8.03E+002
EU-154	Not Detected	---------	3.22E+003
EU-155	Not Detected	---------	2.39E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	2.82E+006
HG-203	Not Detected	---------	8.34E+021
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	5.93E+014
K-40	Not Detected	---------	1.40E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	3.34E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	2.20E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	9.57E+005
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	3.76E+017
SB-125	Not Detected	---------	9.85E+003
SN-113	Not Detected	---------	3.67E+010
SR-85	Not Detected	---------	3.69E+016
TA-182	Not Detected	---------	9.93E+010
TA-183	Not Detected	---------	1.00E+026
TC-99m	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	5.84E+010
ZN-65	Not Detected	---------	5.09E+006
ZR-95	Not Detected	---------	8.76E+016

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 1/28/99 9:39:30 AM
QA File : C:\GENIE2K\CAMFILES\LCS3.QAF
Analyst : FCD
Sample ID : 90019408
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/28/99 9:29:14 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.693E-002	1.868E-003	8.762E-002	<	:	:	: >
CS-137 Activity	6.935E-002	1.982E-003	7.155E-002	<	:	:	: >
CO-60 Activity	7.941E-002	2.071E-003	8.152E-002	<	:	:	: >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 1/28/99

Survey Number: SI5885

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept.	Date	Time	Duration
ER Site #58B	Mike Young #6134	012699	1545	N/A

Purpose	Request #	RWP #	EPR #
Release the exterior of soil samples only.	N/A	RWP0309	N/A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP-260/#983	N/A	John P. Kilbane	John P. Kilbane
Bicron Micro Rem #B973D	N/A	N/A	N/A
N/A	N/A	N/A	N/A

#	Item Description/Location	BETA-GAMMA CONTAMINATION Counting Data Attached [X] Yes [ ] No: %Eff. cpm	2Ø Bkg cpm	/Radionuclide dpm / 100 cm²(1)	DU (2) T/R/F	ALPHA CONTAMINATION Counting Data Attached [X] Yes [ ] No: %Eff cpm	N/A Bkg cpm	/Radionuclide dpm / 100 cm²(1)	DU (2) T/R/F	RADIATION SURVEY Bkg µrem/hr (3)	7µrem/hr Distance
1	Sample #'S=044274-001,044274-002,044274-003(1of3 & 2of3),044274-004	≤80	80	ND	T				R	≤7	Contact
2	Sample #'S=044275-001,044275-002,044275-003(1of3 & 2of3),044275-004	≤80	80	ND	T				R	≤7	Contact
3	Sample #'S=044273-001,044273-002,044273-004	≤80	80	ND	T				R	≤7	Contact
4	Sample #'S=044265-001,044265-002,044265-004	≤80	80	ND	T				R	≤7	Contact
5	Sample #'S=044267-001,044267-002,044267-004	≤80	80	ND	T				R	≤7	Contact
6	Sample #'S=044266-001,044266-001,044266004	≤80	80	ND	T				R	≤7	Contact
7	Sample # S=044277-008(1of3 & 2of3)	≤80	80	ND	T				R	≤7	Contact
8	Sample # S=044277-006(1of3, 2of3 & 3of3)	≤80	80	ND	T				R	≤7	Contact
9	Sample # S=044277-010 (1of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
10	Sample # S=044277-005 (1of3, 2of3 & 3of3)	≤80	80	ND	T				R	≤7	Contact
11	Sample # S=044277-009 51of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
12	Sample #'S=044277-011(1of2 & 2of2)	≤80	80	ND	T				R	≤7	Contact
						N					
						A					

Note (1) If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, of other than gamma (i.e., η or β).

COPY

Remarks

Reviewed by Date:

****
* Sandia Radioactive Sample Diagnostics Program 1-27-1999 *
****
LSC Analysis Program - version 5.3

2-4
#515885

Batch Number : 93007801
Count Protocol : 3
Client : ER58B SAMPLES 1/26/99 JP KILBANE 7526 93007801
Laboratory ID : 6921 - S#411293
Count Date : 26-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 0-12
Count Time : 5.0 minutes
Background cpm : 25.00 +- 5.61
Background tSIE : 458.8
Background Eff : 0.411
Systematic Error : 12.90%
Sample Aliquot : 1.000 f

H-3 MDA = 2.67E+01 dpm/f
H-3 CL = 1.27E+01 dpm/f

H-3 Efficiency = 0.9740 - exp(-0.00047*tSIE^1.1600)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
©CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: RT Preston 1/27/99 Reviewed by: RT Preston 1/27/99

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	H-3 Activity dpm/f	Error	Flag
2	001	001	2.02E+01	4.40E+00	416	0.375	-1.28E+01	2.84E+01	<CL
3	002	002	2.30E+01	4.58E+00	431	0.388	-5.15E+00	2.69E+01	<CL
4	003	003	1.90E+01	4.29E+00	414	0.373	-1.39E+01	2.83E+01	<CL
5	004	004	2.22E+01	4.58E+00	405	0.366	-7.65E+00	2.88E+01	<CL
6	005	005	2.20E+01	4.53E+00	411	0.371	-8.09E+00	2.84E+01	<CL
7	006	006	1.96E+01	4.35E+00	413	0.372	-1.45E+01	2.86E+01	<CL
8	007	007	1.94E+01	4.44E+00	430	0.387	-1.45E+01	2.79E+01	<CL
9	008	008	2.12E+01	4.70E+00	419	0.377	-1.01E+01	2.86E+01	<CL
10	009	009	2.06E+01	4.65E+00	428	0.385	-1.14E+01	2.81E+01	<CL
11	010	010	1.96E+01	4.42E+00	423	0.381	-1.42E+01	2.82E+01	<CL
12	011	011	2.22E+01	4.72E+00	422	0.380	-7.37E+00	2.81E+01	<CL
13	013	012	2.10E+01	4.44E+00	398	0.360	-1.11E+01	2.94E+01	<CL

COPY

```
**********************************************************************
* Sandia Radioactive Sample Diagnostics Program          1-27 1999 *
**********************************************************************
LSC Analysis Program - version 5.3
```

3-4
#515885

```
Batch Number        : 93007801
Count Protocol      : 3
Client              : ER58B SAMPLES 1/26/99 JP KILBANE 7526      93007801
Laboratory ID       : 6921 - S#411299
Count Date          : 26-Jan-99
Protocol Name       : H3AB -- SWIPE
Region of Interest  : 20-600
Count Time          : 5.0 minutes
Background cpm      : 3.20 +- 1.60
Background tSIE     : 458.8
Background Eff      : 1.039
Systematic Error    :  8.90%
Sample Aliquot      : 1.000 f

Alpha MDA =  4.11E+00 dpm/f
Alpha CL  =  1.79E+00 dpm/f

Alpha Efficiency = 1.0390 - exp(-0.00900*tSIE^1.1780)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
```

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Alpha Activity dpm/f	Error	Flag
2	001	001	3.00E+00	1.55E+00	416	1.039	-1.92E-01	3.05E+00	<CL
3	002	002	3.20E+00	1.60E+00	431	1.039	0.00E+00	3.08E+00	<CL
4	003	003	2.00E+00	1.26E+00	414	1.039	-1.15E+00	2.86E+00	<CL
5	004	004	2.40E+00	1.39E+00	405	1.039	-7.70E-01	2.94E+00	<CL
6	005	005	2.60E+00	1.44E+00	411	1.039	-5.77E-01	2.98E+00	<CL
7	006	006	3.20E+00	1.60E+00	413	1.039	0.00E+00	3.08E+00	<CL
8	007	007	3.20E+00	1.60E+00	430	1.039	0.00E+00	3.08E+00	<CL
9	008	008	2.20E+00	1.33E+00	419	1.039	-9.62E-01	2.90E+00	<CL
10	009	009	2.60E+00	1.44E+00	428	1.039	-5.77E-01	2.98E+00	<CL
11	010	010	3.60E+00	1.70E+00	423	1.039	3.85E-01	3.21E+00	<CL
12	011	011	1.40E+00	1.06E+00	422	1.039	-1.73E+00	2.71E+00	<CL
13	012	012	2.60E+00	1.44E+00	398	1.039	-5.77E-01	2.98E+00	<CL

COPY

****
* Sandia Radioactive Sample Diagnostics Program 1-27-1999 *
****
LSC Analysis Program - version 5.0

4-4
#515885

Batch Number : 93007801
Count Protocol : 3
Client : ER58B SAMPLES 1/26/99 JP KILBANE 7526 93007801
Laboratory ID : 6921 - S#411293
Count Date : 26-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 12-2000
Count Time : 5.0 minutes
Background cpm : 37.40 +- 5.47
Background tSIE : 458.8
Background Eff : 0.841
Systematic Error : 6.30%
Sample Aliquot : 1.000 f

Beta MDA = 7.58E+01 dpm/f
Beta CL = 7.58E+00 dpm/f

Beta Efficiency = 0.8410 - exp(-0.01319*tSIE^1.1040)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.

S#	RPSD ID	Client ID	cpm	Error	tSIE	Eff	Beta Activity dpm/f	Error	Flag
2	001	001	4.06E+01	5.70E+00	416	0.841	3.81E+00	1.35E+01	<CL
3	002	002	4.34E+01	5.89E+00	431	0.841	7.13E+00	1.40E+01	<CL
4	003	003	3.96E+01	5.63E+00	414	0.841	2.62E+00	1.34E+01	<CL
5	004	004	3.64E+01	5.39E+00	405	0.841	-1.19E+00	1.30E+01	<CL
6	005	005	4.28E+01	5.85E+00	411	0.841	6.42E+00	1.39E+01	<CL
7	006	006	4.02E+01	5.67E+00	413	0.841	3.33E+00	1.35E+01	<CL
8	007	007	4.56E+01	6.04E+00	430	0.841	9.75E+00	1.43E+01	@CL
9	008	008	4.02E+01	5.67E+00	419	0.841	3.33E+00	1.35E+01	<CL
10	009	009	4.02E+01	5.67E+00	428	0.841	3.33E+00	1.35E+01	<CL
11	010	010	4.04E+01	5.68E+00	423	0.841	3.57E+00	1.35E+01	<CL
12	011	011	3.66E+01	5.41E+00	422	0.841	-9.51E-01	1.30E+01	<CL
13	012	012	4.04E+01	5.68E+00	398	0.841	3.57E+00	1.35E+01	<CL

COPY

Internal Lab 900183

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Batch No. SAR/WR No.

AR/COC 601350

COPY

Dept. No./Mail Stop:	6134/1148	Data Sample Shipped:	SMO USA	Contract No.:	~~AJ 2480~~
Project/Task Manager:	~~Site 8/58~~ Caroline Byrd	Carrier/Way Bill No.:		Case No.:	7213.220600
Project Name:	Foothill Test Area Site 58	Lab Contact:	~~Edie Kent~~ Fernando	SMO Authorization:	
Record Center Code:	ER/1333/58/DAT	Lab Destination:	~~OEL~~ AMIR	Bill To:	Sandia National Laboratories
Logbook Ref. No.:		SMO Contact/Phone:	Doug Salmi/848-0963	Supplier Services Dept.:	
Service Order No.	CF0655	Send Report to SMO:	Suzi Jonson	P O Box 5800 MS 0154	
Location	NA				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Lab Sample ID
✓ 044269-004	S58BH2-GR-001-3-S	3	58	12599/1350	s	M	500m	NONE	G	SA	Gamma Spec	
✓ 044270-004	S58BH2-GR-002-5-S	5	58	12599/1402	s	M	500m	NONE	G	SA	Gamma Spec	
✓ 044271-004	S58BH2-GR-003-7-S	7	58	12599/~~1418~~ 1433	s	M	500m	NONE	G	SA	Gamma Spec	

RMMA ☒ Yes ☐ No Ref. No.

Sample Disposal ☐ Return to Client ☒ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush

Required Report Date 2/3/99 vg

Special Instructions/QC Requirements

EDD ☒ Yes ☐ No

Raw Data Package ☐ Yes ☒ No

This COC releases 601349

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Chris Catechis	C.J. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	William T Gibson	WTG	MDM/6131/235-3841

Please list as separate report.

1.Relinquished by	William T Gibson	Org. 6131	Date 1-26-99	Time 16:20	4.Relinquished by	Org. 7578	Date 2/1/99 Time 0921
1. Received by	(SMO)	Org. 7578	Date 1-26-99	Time 1620	4. Received by	Org. 6133	Date 2/1/99 Time 0921
2.Relinquished by	SMO	Org. 7577	Date 1-26-99	Time 1635	5.Relinquished by	Org.	Date Time
2. Received by		Org. SWL7578	Date 1-26-99	Time 1635	5. Received by	Org.	Date Time
3.Relinquished by		Org. SWL7578	Date 1/27/99	Time 1010	6.Relinquished by	Org.	Date Time
3. Received by	(SMO)	Org. 7578	Date 1/27/99	Time 1010	6. Received by	Org.	Date Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Site 8/58
Phone: 845-0868
Date Results Needed: Rush
Suspect Isotopes: UNK
Other Information: N/A

Hazards/Special Instructions:

RUSH

Case # 7213.2206
COC # 601350

Batch Log Number: 900183
Logged By: TMO

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044269-004	Soil	12599/1350	500 ml	Gamma Spec	01	<300	902	
049270-004	↓	12599/1402	↓	↓	02	<300	902	
049271-004	↓	12599/1418	↓	↓	03	<300	882	
LCS	—	1/27/99	—	δ spec	04	N/A	N/A	

Relinquished by	[signature]	Date 1-26-99	Time 1635	Received by	[signature]	Date 1/26/99	Time 1635
Relinquished by	[signature]	Date 1/27/99	Time 1010	Received by	[signature]	Date 1/27/99	Time 1010
Relinquished by		Date	Time	Received by		Date	Time
Relinquished by		Date	Time	Received by		Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/26/99 7:55:58 PM

Analyzed by: 1/27/99 Reviewed by: 1/27/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044269-004
Lab Sample ID : 90018301

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 902.000 gram
Sample Date/Time : 1/25/99 1:50:00 PM
Acquire Start Date/Time : 1/26/99 6:15:41 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.35E-001
RA-226	1.39E+000	2.57E+000	4.49E-001
PB-214	5.27E-001	7.08E-001	3.76E-002
BI-214	4.82E-001	1.02E-001	3.22E-002
PB-210	Not Detected	---	2.99E+001
TH-232	7.62E-001	3.85E-001	1.14E-001
RA-228	8.88E-001	1.26E-001	1.34E-001
AC-228	7.26E-001	1.80E-001	6.38E-002
TH-228	7.28E-001	7.65E-001	3.35E-001
RA-224	8.50E-001	2.04E-001	4.37E-002
PB-212	7.39E-001	1.30E-001	3.25E-002
BI-212	8.06E-001	4.10E-001	2.37E-001
TL-208	6.64E-001	1.53E-001	4.92E-002
U-235	8.96E-002	1.46E-001	1.86E-001
TH-231	Not Detected	---	1.15E+000
PA-231	Not Detected	---	1.11E+000
TH-227	Not Detected	---	3.02E-001
RA-223	Not Detected	---	1.65E-001
RN-219	Not Detected	---	2.87E-001
PB-211	Not Detected	---	6.39E-001
TL-207	Not Detected	---	1.01E+001
AM-241	Not Detected	---	4.00E-001
PU-239	Not Detected	---	3.44E+002
NP-237	Not Detected	---	2.82E-001
PA-233	Not Detected	---	4.39E-002
TH-229	Not Detected	---	2.12E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90018301

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	2.71E-002
AG-110m	Not Detected	---------	2.98E-002
BA-133	Not Detected	---------	4.60E-002
BE-7	Not Detected	---------	1.84E-001
CD-109	Not Detected	---------	9.56E-001
CD-115	Not Detected	---------	7.57E-002
CE-139	Not Detected	---------	2.39E-002
CE-141	Not Detected	---------	4.14E-002
CE-144	Not Detected	---------	1.85E-001
CO-56	Not Detected	---------	2.53E-002
CO-57	Not Detected	---------	2.45E-002
CO-58	Not Detected	---------	2.39E-002
CO-60	Not Detected	---------	2.67E-002
CR-51	Not Detected	---------	1.81E-001
CS-134	Not Detected	---------	2.74E-002
CS-137	Not Detected	---------	1.76E-002
EU-152	Not Detected	---------	7.35E-002
EU-154	Not Detected	---------	1.34E-001
EU-155	Not Detected	---------	1.17E-001
FE-59	Not Detected	---------	5.62E-002
GD-153	Not Detected	---------	8.91E-002
HG-203	Not Detected	---------	2.49E-002
I-131	Not Detected	---------	2.30E-002
IR-192	Not Detected	---------	2.14E-002
K-40	1.68E+001	2.38E+000	1.94E-001
MN-52	Not Detected	---------	2.44E-002
MN-54	Not Detected	---------	2.66E-002
MO-99	Not Detected	---------	2.25E-001
NA-22	Not Detected	---------	3.25E-002
NA-24	Not Detected	---------	1.03E-001
NB-95	Not Detected	---------	1.65E-001
ND-147	Not Detected	---------	1.60E-001
NI-57	Not Detected	---------	6.33E-002
RU-103	Not Detected	---------	2.22E-002
RU-106	Not Detected	---------	2.03E-001
SB-122	~~1.20E-002~~	~~9.22E-003~~	1.42E-002
SB-124	Not Detected	---------	2.28E-002
SB-125	Not Detected	---------	6.36E-002
SN-113	Not Detected	---------	2.77E-002
SR-85	Not Detected	---------	2.74E-002
TA-182	Not Detected	---------	1.15E-001
TA-183	Not Detected	---------	3.99E-001
TC-99m	Not Detected	---------	6.33E-001
TL-201	Not Detected	---------	1.89E-001
XE-133	Not Detected	---------	1.66E-001
Y-88	Not Detected	---------	1.82E-002
ZN-65	Not Detected	---------	7.35E-002
ZR-95	Not Detected	---------	4.19E-002

Not detected
1/27/99

```
***********************************************************************
*                  Sandia National Laboratories                       *
*    Radiation Protection Sample Diagnostics Program [806 Laboratory] *
*                   1/26/99   9:37:43 PM                              *
***********************************************************************
*                                                                     *
* Analyzed by:            1/27/99      Reviewed by:        1/27/99    *
***********************************************************************
Customer                     : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID           : 044270-004
Lab Sample ID                : 90018302

Sample Description           : MARINELLI SOLID SAMPLE
Sample Quantity              :   902.000  gram
Sample Date/Time             :  1/25/99    2:02:00 PM
Acquire Start Date/Time      :  1/26/99    7:57:30 PM
Detector Name                : LAB02
Elapsed Live/Real Time       :   6000 /    6003 seconds

Comments:
***********************************************************************
```

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	5.85E-001
RA-226	1.22E+000	7.09E-001	4.35E-001
PB-214	5.05E-001	1.04E-001	3.50E-002
BI-214	4.97E-001	1.08E-001	3.31E-002
PB-210	Not Detected	---------	2.89E+001
TH-232	4.98E-001	2.92E-001	1.07E-001
RA-228	6.16E-001	2.04E-001	1.10E-001
AC-228	5.55E-001	1.75E-001	6.76E-002
TH-228	5.30E-001	2.57E-001	3.24E-001
RA-224	6.28E-001	1.56E-001	2.95E-002
PB-212	5.68E-001	1.19E-001	3.10E-002
BI-212	5.65E-001	3.18E-001	2.88E-001
TL-208	5.43E-001	1.28E-001	4.89E-002
U-235	Not Detected	---------	1.76E-001
TH-231	Not Detected	---------	1.13E+000
PA-231	Not Detected	---------	1.05E+000
TH-227	Not Detected	---------	2.73E-001
RA-223	Not Detected	---------	1.60E-001
RN-219	Not Detected	---------	2.69E-001
PB-211	Not Detected	---------	5.98E-001
TL-207	Not Detected	---------	1.05E+001
AM-241	Not Detected	---------	3.96E-001
PU-239	Not Detected	---------	3.27E+002
NP-237	Not Detected	---------	2.22E-001
PA-233	Not Detected	---------	4.12E-002
TH-229	Not Detected	---------	2.07E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90018302

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	2.58E-002
AG-110m	Not Detected	---------	2.20E-002
BA-133	Not Detected	---------	4.48E-002
BE-7	Not Detected	---------	1.74E-001
CD-109	Not Detected	---------	7.52E-001
CD-115	Not Detected	---------	7.04E-002
CE-139	Not Detected	---------	2.28E-002
CE-141	Not Detected	---------	3.99E-002
CE-144	Not Detected	---------	1.79E-001
CO-56	Not Detected	---------	2.41E-002
CO-57	Not Detected	---------	2.27E-002
CO-58	Not Detected	---------	2.33E-002
CO-60	Not Detected	---------	2.77E-002
CR-51	Not Detected	---------	1.80E-001
CS-134	Not Detected	---------	2.57E-002
CS-137	Not Detected	---------	2.45E-002
EU-152	Not Detected	---------	6.86E-002
EU-154	Not Detected	---------	1.24E-001
EU-155	Not Detected	---------	1.16E-001
FE-59	Not Detected	---------	5.43E-002
GD-153	Not Detected	---------	8.60E-002
HG-203	Not Detected	---------	2.30E-002
I-131	Not Detected	---------	2.35E-002
IR-192	Not Detected	---------	2.04E-002
K-40	1.80E+001	2.54E+000	1.81E-001
MN-52	Not Detected	---------	2.33E-002
MN-54	Not Detected	---------	2.58E-002
MO-99	Not Detected	---------	2.14E-001
NA-22	Not Detected	---------	3.19E-002
NA-24	Not Detected	---------	9.48E-002
NB-95	Not Detected	---------	1.51E-001
ND-147	Not Detected	---------	1.57E-001
NI-57	Not Detected	---------	3.86E-002
RU-103	Not Detected	---------	2.14E-002
RU-106	Not Detected	---------	2.06E-001
SB-122	Not Detected	---------	4.06E-002
SB-124	Not Detected	---------	2.09E-002
SB-125	Not Detected	---------	6.35E-002
SN-113	Not Detected	---------	2.59E-002
SR-85	Not Detected	---------	2.58E-002
TA-182	Not Detected	---------	1.16E-001
TA-183	Not Detected	---------	4.04E-001
TC-99m	Not Detected	---------	7.24E-001
TL-201	Not Detected	---------	1.78E-001
XE-133	Not Detected	---------	1.56E-001
Y-88	Not Detected	---------	1.98E-002
ZN-65	Not Detected	---------	7.57E-002
ZR-95	Not Detected	---------	4.18E-002

****
*
* Sandia National Laboratories
* Radiation Protection Sample Diagnostics Program [806 Laboratory]
* 1/26/99 11:19:30 PM
*
****

* Analyzed by: 1/27/99 Reviewed by: 1/27/99 *

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044271-004
Lab Sample ID : 90018303

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 882.000 gram
Sample Date/Time : 1/25/99 2:18:00 PM
Acquire Start Date/Time : 1/26/99 9:39:17 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.14E-001
RA-226	1.22E+000	7.04E-001	3.98E-001
PB-214	5.57E-001	1.09E-001	3.30E-002
BI-214	5.26E-001	1.11E-001	3.68E-002
PB-210	Not Detected	---	2.81E+001
TH-232	6.50E-001	3.57E-001	1.11E-001
RA-228	5.59E-001	2.46E-001	1.09E-001
AC-228	6.24E-001	1.50E-001	7.06E-002
TH-228	8.12E-001	5.40E-001	3.45E-001
RA-224	6.60E-001	1.64E-001	4.61E-002
PB-212	5.68E-001	3.41E-001	3.04E-002
BI-212	5.92E-001	3.83E-001	2.75E-001
TL-208	5.48E-001	1.32E-001	4.74E-002
U-235	Not Detected	---	1.80E-001
TH-231	Not Detected	---	1.18E+000
PA-231	Not Detected	---	1.05E+000
TH-227	Not Detected	---	2.77E-001
RA-223	Not Detected	---	1.63E-001
RN-219	Not Detected	---	2.84E-001
PB-211	Not Detected	---	6.30E-001
TL-207	Not Detected	---	1.07E+001
AM-241	Not Detected	---	3.89E-001
PU-239	Not Detected	---	3.35E+002
NP-237	Not Detected	---	1.89E-001
PA-233	Not Detected	---	4.22E-002
TH-229	Not Detected	---	2.08E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90018303

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	2.68E-002
AG-110m	Not Detected	---	2.32E-002
BA-133	Not Detected	---	4.44E-002
BE-7	Not Detected	---	1.84E-001
CD-109	Not Detected	---	6.43E-001
CD-115	Not Detected	---	7.37E-002
CE-139	Not Detected	---	2.31E-002
CE-141	Not Detected	---	3.99E-002
CE-144	Not Detected	---	1.80E-001
CO-56	Not Detected	---	2.50E-002
CO-57	Not Detected	---	2.43E-002
CO-58	Not Detected	---	2.44E-002
CO-60	Not Detected	---	2.80E-002
CR-51	Not Detected	---	1.78E-001
CS-134	Not Detected	---	2.83E-002
CS-137	Not Detected	---	2.45E-002
EU-152	Not Detected	---	7.22E-002
EU-154	Not Detected	---	1.28E-001
EU-155	Not Detected	---	1.19E-001
FE-59	Not Detected	---	5.71E-002
GD-153	Not Detected	---	8.64E-002
HG-203	Not Detected	---	2.45E-002
I-131	Not Detected	---	2.36E-002
IR-192	Not Detected	---	2.00E-002
K-40	1.79E+001	2.54E+000	1.87E-001
MN-52	Not Detected	---	2.52E-002
MN-54	Not Detected	---	9.93E-003
MO-99	Not Detected	---	2.18E-001
NA-22	Not Detected	---	3.63E-002
NA-24	Not Detected	---	1.15E-001
NB-95	Not Detected	---	1.56E-001
ND-147	Not Detected	---	1.59E-001
NI-57	Not Detected	---	6.74E-002
RU-103	Not Detected	---	2.21E-002
RU-106	Not Detected	---	2.08E-001
SB-122	Not Detected	---	4.16E-002
SB-124	Not Detected	---	2.23E-002
SB-125	Not Detected	---	6.12E-002
SN-113	Not Detected	---	2.75E-002
SR-85	Not Detected	---	2.76E-002
TA-182	Not Detected	---	1.16E-001
TA-183	Not Detected	---	3.97E-001
TC-99m	Not Detected	---	8.73E-001
TL-201	Not Detected	---	1.90E-001
XE-133	Not Detected	---	1.67E-001
Y-88	Not Detected	---	1.78E-002
ZN-65	Not Detected	---	7.79E-002
ZR-95	Not Detected	---	4.40E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 1/27/99 5:51:04 AM *
****
*
* Analyzed by: 1/27/99 Reviewed by: 1/27/99 *
****

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90018304

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/27/99 5:40:48 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 606 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	4.22E+003
RA-226	Not Detected	---	5.75E+003
PB-214	Not Detected	---	6.36E+002
BI-214	Not Detected	---	5.60E+002
PB-210	Not Detected	---	2.66E+005
TH-232	Not Detected	---	1.94E+003
RA-228	Not Detected	---	2.27E+003
AC-228	Not Detected	---	1.33E+003
TH-228	Not Detected	---	1.24E+005
RA-224	Not Detected	---	4.08E+003
PB-212	Not Detected	---	9.36E+003
BI-212	Not Detected	---	7.32E+004
TL-208	Not Detected	---	1.65E+004
U-235	Not Detected	---	1.57E+003
TH-231	Not Detected	---	9.48E+003
PA-231	Not Detected	---	1.31E+004
TH-227	Not Detected	---	2.40E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	5.31E+003
PB-211	Not Detected	---	1.21E+004
TL-207	Not Detected	---	1.92E+005
AM-241	7.88E+004	5.41E+004	3.11E+003
PU-239	Not Detected	---	2.72E+006
NP-237	Not Detected	---	2.13E+003
PA-233	Not Detected	---	5.54E+002
TH-229	Not Detected	---	1.76E+003

[Summary Report] - Sample ID: : 90018304

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	2.88E+002
AG-110m	Not Detected	---	6.03E+006
BA-133	Not Detected	---	6.76E+002
BE-7	Not Detected	---	3.10E+020
CD-109	Not Detected	---	6.20E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	8.20E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.40E+006
CO-56	Not Detected	---	1.79E+014
CO-57	Not Detected	---	4.51E+005
CO-58	Not Detected	---	1.74E+015
CO-60	7.97E+004	1.07E+004	3.85E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.18E+003
CS-137	7.18E+004	9.52E+003	2.42E+002
EU-152	Not Detected	---	9.65E+002
EU-154	Not Detected	---	2.46E+003
EU-155	Not Detected	---	3.26E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	3.99E+006
HG-203	Not Detected	---	7.33E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	4.71E+014
K-40	Not Detected	---	1.30E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	2.50E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.64E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	7.69E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	2.90E+017
SB-125	Not Detected	---	8.33E+003
SN-113	Not Detected	---	2.98E+010
SR-85	Not Detected	---	2.97E+016
TA-182	Not Detected	---	7.43E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	4.30E+010
ZN-65	Not Detected	---	3.86E+006
ZR-95	Not Detected	---	6.57E+016

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*
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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

Quality Assurance Report

Report Date	:	1/27/99 5:51:08 AM
QA File	:	C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst	:	FCD
Sample ID	:	90018304
Sample Quantity	:	1.00 Each
Sample Date	:	11/01/90 12:00:00 PM
Measurement Date	:	1/27/99 5:40:48 AM
Elapsed Live Time	:	600 seconds
Elapsed Real Time	:	606 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
AM-241 Activity	8.191E-002	4.076E-003	7.877E-002	<	:	:	: >
CS-137 Activity	7.057E-002	1.982E-003	7.175E-002	<	:	:	: >
CO-60 Activity	7.854E-002	2.172E-003	7.980E-002	<	:	:	: >

Flags Key:
- LU = Boundary Test (Ab = Above , Be = Below)
- SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
- UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
- BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____ 1/27/99

Feature 58AAA

Internal Lab

Batch No. 900156

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SAR/WR No. 1/22/99 per R. Rivera V.S.

AR/COC 601312

Dept. No./Mail Stop:	6134/1148	[redacted]	Contract No.: AJ-2480A
Project/Task Manager:	Site 8/58 Caroline Byrd		Case No.: 7213.220600
Project Name:	Foothill Test Area	Lab Contact: ~~Edie Kent~~ Fernando	SMO Authorization:
Record Center Code:	ER/1333/58/DAT	Lab Destination: ~~OEL~~ AMIR RPSD	Bill To: Sandia National Laboratories
Logbook Ref. No.:	N/A	SMO Contact/Phone: Doug Salmi/848-0963	Supplier Services Dept.:
Service Order No.	CF0655	Send Report to SMO: SUZI JENSON	P.O. Box 5800 MS 0154
Location	NA		

COPY

Reference LOV(available at SMO)

Lab Use

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
044132-004	S58BHB-GR-00-0 4-S	0	58	12099 / 1515	S	M	500m	none	G	SA	Gamma Spec	[redacted]
044133-004	S58BHB-GR-105 0-SD	0	58	12099 / 1515	S	M	500m	none	G	DU SA	Gamma Spec	
				Vg 2/3/99								

RMMA ☐ Yes ☒ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush

Required Report Date

Special Instructions/QC Requirements

EDD ☐ Yes (☒ No)

Raw Data Package ☐ Yes ☒ No

Non-releasing COC

Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Chris Catechis	Ch. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	William J. Gibson Jr	WJG	MDM/6131/235-3841

1. Relinquished by	Ch. Catechis	Org. 6131	Date 1/22/99	Time 1050	4. Relinquished by	[redacted]	Org. 7578	Date 1/26/99	Time 12:20
1. Received by	Ralph E. Shaw Sandia	Org. 7577	Date 1/22/99	Time 1050	4. Received by	[redacted] SMO	Org. 7577	Date 1-26-99	Time 1220
2. ~~Relinquished by~~	Ch. Catechis	Org. 6131	~~Date 1/22/99~~	~~Time 10~~	5 Relinquished by	[redacted] (SMO)	Org. 7578	Date 2/1/99	Time 0930
2. ~~Received by~~		Org.	~~Date~~	~~Time~~	5. Received by	[redacted]	Org. 6133	Date 2/1/99	Time 0930
3. Relinquished by	Ralph E. Shaw Sandia	Org. 7577	Date 1/22/99	Time 1420	6 Relinquished by		Org.	Date	Time
3. Received by	[redacted]	Org. SNL 7578	Date 1-22-99	Time 1420	6. Received by		Org.	Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Foothill Test Area 8&9
Phone: 845-0868
Date Results Needed: 1-26-99
Suspect Isotopes: UNK
Other Information: 7213, 2206

Hazards/Special Instructions:
NON-RMMA
COC 601312
100 MIN COUNT

CoC 601312

Batch Log Number: 900156
Logged By: JM

Analysis Type:
- [X] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044132-004	Soil	12099/1515	500 m	Gamma Spec	01	<300	725 g	
044133-004	Soil	12099/1515	500 m	Gamma Spec	02	<300	693 g	
LCS	—	1NOV90	—	g spec	03	N/A	N/A	

Relinquished by [signature] Date 1/22/99 Time 1420 Received by [signature] Date 1/22/99 Time 1420
Relinquished by [signature] Date 1/26/99 Time 12:20 Received by [signature] Date 1/26/99 Time 1220
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

```
****************************************************************************
*                      Sandia National Laboratories                        *
*    Radiation Protection Sample Diagnostics Program [806 Laboratory]     *
*                         1/25/99  4:14:06 PM                              *
****************************************************************************
*                                                                          *
* Analyzed by: [signature] 1/25/99      Reviewed by: [signature] 1/26/99   *
****************************************************************************
```

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044132-004
Lab Sample ID : 90015601

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 725.000 gram
Sample Date/Time : 1/20/99 3:15:00 PM
Acquire Start Date/Time : 1/23/99 12:12:38 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	7.07E-001
RA-226	9.66E-001	7.14E-001	5.26E-001
PB-214	4.77E-001	1.14E-001	4.05E-002
BI-214	4.74E-001	1.09E-001	4.11E-002
PB-210	Not Detected	---------	3.35E+001
TH-232	8.82E-001	4.34E-001	1.21E-001
RA-228	8.85E-001	2.86E-001	1.32E-001
AC-228	7.59E-001	2.24E-001	8.44E-002
TH-228	1.03E+000	3.15E-001	4.42E-001
RA-224	8.38E-001	2.09E-001	6.44E-002
PB-212	8.29E-001	2.71E-001	3.32E-002
BI-212	9.76E-001	5.06E-001	2.74E-001
TL-208	7.22E-001	1.41E-001	5.60E-002
U-235	Not Detected	---------	2.03E-001
TH-231	Not Detected	---------	1.36E+000
PA-231	Not Detected	---------	1.22E+000
TH-227	Not Detected	---------	3.54E-001
RA-223	Not Detected	---------	2.02E-001
RN-219	Not Detected	---------	3.35E-001
PB-211	Not Detected	---------	7.55E-001
TL-207	Not Detected	---------	1.18E+001
AM-241	Not Detected	---------	4.53E-001
PU-239	Not Detected	---------	3.84E+002
NP-237	~~5.90E-001~~	~~3.18E-001~~	2.86E-001 Not detected [initials] 1/25/99
PA-233	Not Detected	---------	5.07E-002
TH-229	Not Detected	---------	2.49E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90015601

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.17E-002
AG-110m	Not Detected	---------	3.21E-002
BA-133	Not Detected	---------	4.97E-002
BE-7	Not Detected	---------	2.16E-001
CD-109	Not Detected	---------	9.73E-001
CD-115	Not Detected	---------	1.26E-001
CE-139	Not Detected	---------	2.75E-002
CE-141	Not Detected	---------	4.66E-002
CE-144	Not Detected	---------	2.14E-001
CO-56	Not Detected	---------	3.07E-002
CO-57	Not Detected	---------	2.83E-002
CO-58	Not Detected	---------	2.81E-002
CO-60	Not Detected	---------	3.25E-002
CR-51	Not Detected	---------	2.12E-001
CS-134	Not Detected	---------	3.09E-002
CS-137	7.54E-002	3.92E-002	2.04E-002
EU-152	Not Detected	---------	8.49E-002
EU-154	Not Detected	---------	1.57E-001
EU-155	Not Detected	---------	1.37E-001
FE-59	Not Detected	---------	6.23E-002
GD-153	Not Detected	---------	1.06E-001
HG-203	Not Detected	---------	2.75E-002
I-131	Not Detected	---------	3.12E-002
IR-192	Not Detected	---------	2.43E-002
K-40	1.86E+001	2.71E+000	2.17E-001
MN-52	Not Detected	---------	3.50E-002
MN-54	Not Detected	---------	3.03E-002
MO-99	Not Detected	---------	3.66E-001
NA-22	Not Detected	---------	3.75E-002
NA-24	Not Detected	---------	3.87E-001
NB-95	Not Detected	---------	2.42E-001
ND-147	Not Detected	---------	1.97E-001
NI-57	Not Detected	---------	7.26E-002
RU-103	Not Detected	---------	2.52E-002
RU-106	Not Detected	---------	2.48E-001
SB-122	Not Detected	---------	6.64E-002
SB-124	Not Detected	---------	2.57E-002
SB-125	Not Detected	---------	7.65E-002
SN-113	Not Detected	---------	3.26E-002
SR-85	Not Detected	---------	3.27E-002
TA-182	Not Detected	---------	1.34E-001
TA-183	Not Detected	---------	5.35E-001
TC-99m	Not Detected	---------	1.92E+001
TL-201	Not Detected	---------	2.79E-001
U-234	Not Detected	---------	6.11E+001
XE-133	Not Detected	---------	2.72E-001
Y-88	Not Detected	---------	1.92E-002
ZN-65	Not Detected	---------	8.75E-002
ZR-95	Not Detected	---------	5.13E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 1/25/99 4:31:14 PM *
****

* Analyzed by: 1/25/99 Reviewed by: 1/26/99 *

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044133-004
Lab Sample ID : 90015602

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 693.000 gram
Sample Date/Time : 1/20/99 3:15:00 PM
Acquire Start Date/Time : 1/23/99 1:53:25 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	7.31E-001
RA-226	1.11E+000	8.98E-001	4.95E-001
PB-214	5.27E-001	4.83E-001	4.25E-002
BI-214	4.76E-001	1.12E-001	4.19E-002
PB-210	Not Detected	---------	3.32E+001
TH-232	7.92E-001	4.21E-001	1.49E-001
RA-228	8.00E-001	3.16E-001	1.40E-001
AC-228	7.98E-001	2.16E-001	8.03E-002
TH-228	9.23E-001	7.79E-001	4.45E-001
RA-224	7.46E-001	1.90E-001	6.94E-002
PB-212	7.89E-001	2.38E-001	3.91E-002
BI-212	8.68E-001	5.45E-001	2.71E-001
TL-208	7.64E-001	1.78E-001	6.25E-002
U-235	Not Detected	---------	2.12E-001
TH-231	Not Detected	---------	1.36E+000
PA-231	Not Detected	---------	1.30E+000
TH-227	Not Detected	---------	3.51E-001
RA-223	Not Detected	---------	2.09E-001
RN-219	Not Detected	---------	3.32E-001
PB-211	Not Detected	---------	7.69E-001
TL-207	Not Detected	---------	1.26E+001
AM-241	Not Detected	---------	4.55E-001
PU-239	Not Detected	---------	4.01E+002
NP-237	~~4.14E-001~~	~~1.82E-001~~	2.57E-001 Not Detected 1/25/99
PA-233	Not Detected	---------	5.18E-002
TH-229	Not Detected	---------	2.48E-001

[Summary Report] - Sample ID: : 90015602

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.34E-002
AG-110m	Not Detected	---------	3.24E-002
BA-133	Not Detected	---------	5.40E-002
BE-7	Not Detected	---------	2.38E-001
CD-109	Not Detected	---------	8.73E-001
CD-115	Not Detected	---------	1.32E-001
CE-139	Not Detected	---------	2.80E-002
CE-141	Not Detected	---------	4.84E-002
CE-144	Not Detected	---------	2.14E-001
CO-56	Not Detected	---------	3.02E-002
CO-57	Not Detected	---------	2.84E-002
CO-58	Not Detected	---------	2.77E-002
CO-60	Not Detected	---------	3.26E-002
CR-51	Not Detected	---------	2.20E-001
CS-134	Not Detected	---------	3.14E-002
CS-137	5.29E-002	3.12E-002	2.21E-002
EU-152	Not Detected	---------	8.62E-002
EU-154	Not Detected	---------	1.61E-001
EU-155	Not Detected	---------	1.38E-001
FE-59	Not Detected	---------	6.86E-002
GD-153	Not Detected	---------	1.06E-001
HG-203	Not Detected	---------	2.96E-002
I-131	Not Detected	---------	3.28E-002
IR-192	Not Detected	---------	2.40E-002
K-40	2.09E+001	3.15E+000	2.26E-001
MN-52	Not Detected	---------	3.57E-002
MN-54	Not Detected	---------	3.11E-002
MO-99	Not Detected	---------	3.79E-001
NA-22	Not Detected	---------	4.11E-002
NA-24	Not Detected	---------	4.23E-001
NB-95	Not Detected	---------	2.44E-001
ND-147	Not Detected	---------	2.05E-001
NI-57	Not Detected	---------	1.31E-001
RU-103	Not Detected	---------	2.58E-002
RU-106	Not Detected	---------	2.43E-001
SB-122	Not Detected	---------	6.74E-002
SB-124	Not Detected	---------	2.64E-002
SB-125	Not Detected	---------	7.70E-002
SN-113	Not Detected	---------	3.42E-002
SR-85	Not Detected	---------	3.45E-002
TA-182	Not Detected	---------	1.40E-001
TA-183	Not Detected	---------	5.41E-001
TC-99m	Not Detected	---------	2.43E+001
TL-201	Not Detected	---------	2.88E-001
U-234	Not Detected	---------	6.07E+001
XE-133	Not Detected	---------	2.85E-001
Y-88	Not Detected	---------	2.50E-002
ZN-65	Not Detected	---------	9.01E-002
ZR-95	Not Detected	---------	4.95E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 1/23/99 12:56:56 PM *
****
*
* Analyzed by: 1/25/99 Reviewed by: 1/26/99 *
****

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90015603

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/23/99 12:46:42 PM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 606 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	4.16E+003
RA-226	Not Detected	---------	5.86E+003
PB-214	Not Detected	---------	6.43E+002
BI-214	Not Detected	---------	5.54E+002
PB-210	Not Detected	---------	2.65E+005
TH-232	Not Detected	---------	1.96E+003
RA-228	Not Detected	---------	2.26E+003
AC-228	Not Detected	---------	1.33E+003
TH-228	Not Detected	---------	1.22E+005
RA-224	Not Detected	---------	4.54E+003
PB-212	Not Detected	---------	9.33E+003
BI-212	Not Detected	---------	7.19E+004
TL-208	Not Detected	---------	1.66E+004
U-235	Not Detected	---------	1.58E+003
TH-231	Not Detected	---------	7.54E+004
PA-231	Not Detected	---------	1.31E+004
TH-227	Not Detected	---------	2.35E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	5.39E+003
PB-211	Not Detected	---------	1.22E+004
TL-207	Not Detected	---------	2.00E+005
AM-241	8.12E+004	1.48E+004	2.94E+003
PU-239	Not Detected	---------	2.79E+006
NP-237	Not Detected	---------	2.18E+003
PA-233	Not Detected	---------	5.66E+002
TH-229	Not Detected	---------	1.72E+003

[Summary Report] - Sample ID: : 90015603

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	2.75E+002
AG-110m	Not Detected	---	6.00E+006
BA-133	Not Detected	---	6.78E+002
BE-7	Not Detected	---	2.97E+020
CD-109	Not Detected	---	6.34E+005
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	7.98E+008
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	2.33E+006
CO-56	Not Detected	---	1.76E+014
CO-57	Not Detected	---	4.29E+005
CO-58	Not Detected	---	1.72E+015
CO-60	8.08E+004	1.09E+004	3.87E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	4.21E+003
CS-137	7.18E+004	1.05E+004	2.57E+002
EU-152	Not Detected	---	9.20E+002
EU-154	Not Detected	---	2.37E+003
EU-155	Not Detected	---	3.40E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	3.92E+006
HG-203	Not Detected	---	6.77E+021
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	4.65E+014
K-40	Not Detected	---	1.32E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	2.50E+005
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	1.65E+003
NA-24	Not Detected	---	1.00E+026
NB-95	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	7.41E+005
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	2.81E+017
SB-125	Not Detected	---	8.43E+003
SN-113	Not Detected	---	2.89E+010
SR-85	Not Detected	---	2.88E+016
TA-182	Not Detected	---	7.32E+010
TA-183	Not Detected	---	1.00E+026
TC-99m	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
XE-133	Not Detected	---	1.00E+026
Y-88	Not Detected	---	3.64E+010
ZN-65	Not Detected	---	3.75E+006
ZR-95	Not Detected	---	6.11E+016

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

Quality Assurance Report

Report Date	:	1/23/99 12:56:59 PM
QA File	:	C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst	:	FCD
Sample ID	:	90015603
Sample Quantity	:	1.00 Each
Sample Date	:	11/01/90 12:00:00 PM
Measurement Date	:	1/23/99 12:46:42 PM
Elapsed Live Time	:	600 seconds
Elapsed Real Time	:	606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.191E-002	4.085E-003	8.124E-002	<	:	:	: >
CS-137 Activity	7.057E-002	1.984E-003	7.184E-002	<	:	:	: >
CO-60 Activity	7.853E-002	2.174E-003	8.020E-002	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 1/25/99

Feature 58CCC

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

AR/COC- 05875

Internal Lab Batch No. 601789

SF 2001-COC (6-95)

Dept. No./Mail Stop: 6695/ MS 1148
Project/Task Manager: Mike Young
Project Name: Foothills 5805
Record Center Code: ER/1332/58/DAT
Logbook Ref No:
Service Order No.: CF0180

Date Samples Shipped: 9-25-96
Carrier/Waybill No.: HC
Lab Contact: Fernando Dominguez
Lab Destination: RPSD Bldg 891
SMO Contact/Phone: D. McGlaughlin
Send Report to SMO: Kathy Becker

Contract No.: NA
Case No.: 3622-400
SMO Authorization:
Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec

Location Tech Area ER Site 58
Building 9905 Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO): Sample Matrix	Container: Type	Container: Volume	Preservative	Sample Collection Method	Sample Type	Gamma Spec	Lab Sample ID
031487-005	58DP-001-0-SS	0	58	9-24-96 1339	S	P	500ml	None	G	SA	X	
031489-005	58DP-002-0-SS	0		1350						SA		
031490-005	58DP-003-3-S	3		1410						SA		
031491-005	58DP-004-3-S	3		1420						SA		
031492-005	58DP-005-0-S	0		1440						SA		
031493-005	58DP-006-0-S	0		1435						SA		

RMMA ☐ Yes ☒ No Ref. No. ____

Sample Disposal ☒ Return to Client ☐ Disposal by lab

Turnaround Time ☒ Normal ☐ Rush Required Report Date ____

Sample Tracking
Date Entered (mm/dd/yy) ____
Entered by: ____
QC inits. ____

Special Instructions/QC Requirements
- Send copy of report to Rod Nagel fax 284-3174

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Rod Nagel	Rod Nagel	RN	I.T./6684 284-3301
	Gilbert Quintana	Gilbert Quintana	GQ	I.T./6684 284-3308

1. Relinquished by	Rod Nagel	Org. I.T./6684	Date 9-25-96	Time 0935	4. Relinquished by	D McGaughlin	Org. SNL 7578	Date 10/1/96	Time 0830
1. Received by	[signature]	Org. SNL 7578	Date 9/25/96	Time 0935	4. Received by	Rod Nagel	Org. IT/6684	Date 10-1-96	Time 0830
2. Relinquished by	[signature]	Org. 7578	Date 9/25/96	Time 1425	5. Relinquished by		Org.	Date	Time
2. Received by	[signature]	Org. SNL 7578	Date 9/25/96	Time 1425	5. Received by		Org.	Date	Time
3. Relinquished by	[signature]	Org. SNL 7578	Date 9/27/96	Time 1430	6. Relinquished by		Org.	Date	Time
3. Received by	D McGaughlin	Org. SNL 7578	Date 9/27/96	Time 1430	6. Received by		Org.	Date	Time

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer : Mike Young
Organization: 6685
Project Location: ER Site 58
Phone: 284-2595
Date Results Needed: 9/27/96
Suspect Isotopes: UNK
Other Information: C.O.C #05875

Hazards/Special Instructions:

Batch Log Number: 601788
Logged By: JM

Analysis Type:
- ☐ Gamma Spec
- ☐ H-3
- ☐ Alpha/Beta
- ☐ Alpha Spec
- ☐ Total U
- ☐ Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
031487-005	Soil	9-24-96 1339	500 ml	Gamma Spec	01	<300	639 g	
031489-005	↓	1350	↓	↓	02	↓	697 g	
031490-005		1410			03		860 g	
031491-005		1420			04		784 g	
031492-005		1440			05		736 g	
031493-005		1435			06	<300	825 g	
LCS	—	in over	—	γ Spec	07	NA	NA	

Relinquished by R Biswell Date 9/25/96 Time 1425 Received by [signature] Date 9/25/96 Time 1425
Relinquished by [signature] Date 9/27/96 Time 1430 Received by [signature] Date 9/27/96 Time 1430
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 9-25-96 6:55:55 PM *
****
*
* Analyzed by: 9/26/96 Reviewed by: 9/27/96 *
****

Customer : M.YOUNG/D.BISWELL (6685/SMO)
Customer Sample ID : 031487-005
Lab Sample ID : 60178901

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 639.000 gram
Sample Date/Time : 9-24-96 1:39:00 PM
Acquire Start Date/Time : 9-25-96 5:13:08 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.13E+00
TH-234	7.54E-01	6.28E-01	5.63E-01
RA-226	Not Detected	---	5.14E-01
PB-214	4.39E-01	6.79E-02	4.46E-02
BI-214	4.78E-01	1.05E-01	4.29E-02
TH-232	6.13E-01	8.33E-01	1.41E-01
RA-228	6.47E-01	2.15E-01	1.43E-01
AC-228	6.49E-01	1.61E-01	7.85E-02
TH-228	5.15E-01	2.07E-01	4.52E-01
RA-224	6.50E-01	2.13E-01	7.22E-02
PB-212	6.19E-01	1.31E-01	3.52E-02
BI-212	6.74E-01	2.93E-01	2.75E-01
TL-208	5.82E-01	1.36E-01	6.31E-02
U-235	9.43E-02	1.42E-01	1.32E-01
TH-231	Not Detected	---	2.55E+00
PA-231	Not Detected	---	1.38E+00
TH-227	Not Detected	---	3.41E-01
RA-223	Not Detected	---	1.82E-01
RN-219	Not Detected	---	3.66E-01
PB-211	Not Detected	---	8.68E-01
TL-207	Not Detected	---	1.30E+01
AM-241	Not Detected	---	4.90E-01
PU-239	Not Detected	---	4.23E+02
NP-237	Not Detected	---	3.63E-01
PA-233	Not Detected	---	5.60E-02
TH-229	Not Detected	---	2.65E-01

[Summary Report] - Sample ID: : 60178901

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---------	3.63E-02	
AG-110m	Not Detected	---------	4.00E-02	
BA-133	Not Detected	---------	5.39E-02	
BE-7	Not Detected	---------	2.38E-01	
CD-109	1.13E+00	8.55E-01	8.53E-01	not detected JS/27/96
CD-115	Not Detected	---------	8.80E-02	
CE-139	Not Detected	---------	2.78E-02	
CE-141	Not Detected	---------	5.05E-02	
CE-144	Not Detected	---------	2.30E-01	
CO-56	Not Detected	---------	1.47E-01	
CO-57	Not Detected	---------	2.97E-02	
CO-58	Not Detected	---------	3.13E-02	
CO-60	Not Detected	---------	3.59E-02	
CR-51	Not Detected	---------	2.31E-01	
CS-134	Not Detected	---------	4.77E-02	
CS-137	1.25E-01	2.51E-02	2.11E-02	
EU-152	Not Detected	---------	2.36E-01	
EU-154	Not Detected	---------	1.66E-01	
EU-155	Not Detected	---------	1.31E-01	
FE-59	Not Detected	---------	6.91E-02	
GD-153	Not Detected	---------	1.02E-01	
HG-203	Not Detected	---------	2.78E-02	
I-131	Not Detected	---------	2.94E-02	
IR-192	Not Detected	---------	2.67E-02	
K-40	1.32E+01	1.95E+00	2.32E-01	
MN-52	Not Detected	---------	3.42E-02	
MN-54	Not Detected	---------	3.19E-02	
MO-99	Not Detected	---------	3.16E-01	
NA-22	Not Detected	---------	3.62E-02	
NA-24	Not Detected	---------	1.20E-01	
NB-95	Not Detected	---------	1.96E-01	
ND-147	Not Detected	---------	1.95E-01	
NI-57	Not Detected	---------	7.39E-02	
RU-103	Not Detected	---------	2.65E-02	
RU-106	Not Detected	---------	2.65E-01	
SB-122	1.76E-02	1.88E-02	2.90E-02	not detected JS/27/96
SB-124	Not Detected	---------	3.14E-02	
SB-125	Not Detected	---------	7.94E-02	
SR-85	Not Detected	---------	3.70E-02	
TA-182	Not Detected	---------	1.41E-01	
TA-183	Not Detected	---------	4.92E-01	
TC-99m	Not Detected	---------	6.49E-01	
TL-201	Not Detected	---------	1.96E-01	
XE-133	Not Detected	---------	1.67E-01	
Y-88	Not Detected	---------	2.30E-02	
ZN-65	Not Detected	---------	9.26E-02	
ZR-95	Not Detected	---------	5.28E-02	

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-25-96 8:40:52 PM
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* Analyzed by: 9/26/96 Reviewed by: 5/27/96 *

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Customer : M.YOUNG/D.BISWELL (6685/SMO)
Customer Sample ID : 031489-005
Lab Sample ID : 60178902

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 697.000 gram
Sample Date/Time : 9-24-96 1:50:00 PM
Acquire Start Date/Time : 9-25-96 6:58:02 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	3.07E+00	
TH-234	5.62E-01	3.84E-01	4.90E-01	
RA-226	1.41E+00	8.57E-01	5.45E-01	
PB-214	4.98E-01	9.60E-02	4.19E-02	
BI-214	4.97E-01	7.93E-01	4.11E-02	
TH-232	6.42E-01	3.19E-01	1.13E-01	
RA-228	5.75E-01	1.57E-01	1.21E-01	
AC-228	6.72E-01	3.91E-01	6.89E-02	
TH-228	5.31E-01	1.98E-01	4.24E-01	
RA-224	6.64E-01	2.44E-01	6.64E-02	
PB-212	6.30E-01	1.18E-01	3.48E-02	
BI-212	4.66E-01	2.82E-01	2.49E-01	
TL-208	5.27E-01	1.46E-01	6.02E-02	
U-235	Not Detected	---	2.10E-01	
TH-231	Not Detected	---	2.40E+00	
PA-231	Not Detected	---	1.26E+00	
TH-227	Not Detected	---	3.23E-01	
RA-223	Not Detected	---	1.67E-01	
RN-219	Not Detected	---	3.45E-01	
PB-211	Not Detected	---	8.15E-01	
TL-207	Not Detected	---	1.20E+01	
AM-241	Not Detected	---	4.78E-01	
PU-239	Not Detected	---	4.01E+02	
NP-237	~~2.77E-01~~	~~1.79E-01~~	2.20E-01	NOT Detected since 9/26/96
PA-233	Not Detected	---	5.16E-02	
TH-229	Not Detected	---	2.58E-01	

[Summary Report] - Sample ID: : 60178902

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.49E-02
AG-110m	Not Detected	---------	3.35E-02
BA-133	Not Detected	---------	5.41E-02
BE-7	Not Detected	---------	2.15E-01
CD-109	Not Detected	---------	7.55E-01
CD-115	Not Detected	---------	8.42E-02
CE-139	Not Detected	---------	2.69E-02
CE-141	Not Detected	---------	4.85E-02
CE-144	Not Detected	---------	2.14E-01
CO-56	Not Detected	---------	1.35E-01
CO-57	Not Detected	---------	2.78E-02
CO-58	Not Detected	---------	2.79E-02
CO-60	Not Detected	---------	3.19E-02
CR-51	Not Detected	---------	2.02E-01
CS-134	Not Detected	---------	4.62E-02
CS-137	6.82E-02	3.68E-02	2.07E-02
EU-152	Not Detected	---------	2.35E-01
EU-154	Not Detected	---------	1.59E-01
EU-155	Not Detected	---------	1.24E-01
FE-59	Not Detected	---------	6.35E-02
GD-153	Not Detected	---------	1.03E-01
HG-203	Not Detected	---------	2.59E-02
I-131	Not Detected	---------	2.77E-02
IR-192	Not Detected	---------	2.40E-02
K-40	1.23E+01	1.86E+00	2.63E-01
MN-52	Not Detected	---------	3.16E-02
MN-54	Not Detected	---------	2.98E-02
MO-99	Not Detected	---------	3.00E-01
NA-22	Not Detected	---------	3.59E-02
NA-24	Not Detected	---------	1.08E-01
NB-95	Not Detected	---------	1.89E-01
ND-147	Not Detected	---------	1.87E-01
NI-57	Not Detected	---------	3.64E-02
RU-103	Not Detected	---------	2.52E-02
RU-106	Not Detected	---------	2.51E-01
SB-122	Not Detected	---------	4.92E-02
SB-124	Not Detected	---------	2.92E-02
SB-125	Not Detected	---------	7.68E-02
SR-85	Not Detected	---------	3.37E-02
TA-182	Not Detected	---------	1.31E-01
TA-183	Not Detected	---------	4.87E-01
TC-99m	Not Detected	---------	7.39E-01
TL-201	Not Detected	---------	1.81E-01
XE-133	Not Detected	---------	1.61E-01
Y-88	Not Detected	---------	2.68E-02
ZN-65	Not Detected	---------	9.13E-02
ZR-95	Not Detected	---------	4.94E-02

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-25-96 10:26:03 PM
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* Analyzed by: 9/26/96 Reviewed by: 9/27/96 *

Customer : M.YOUNG/D.BISWELL (6685/SMO)
Customer Sample ID : 031490-005
Lab Sample ID : 60178903

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 860.000 gram
Sample Date/Time : 9-24-96 2:10:00 PM
Acquire Start Date/Time : 9-25-96 8:43:02 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.24E+00
TH-234	1.30E+00	3.73E-01	5.34E-01
RA-226	1.28E+00	6.14E-01	5.39E-01
PB-214	4.65E-01	9.94E-02	4.50E-02
BI-214	4.20E-01	7.65E-01	3.70E-02
TH-232	1.10E+00	5.12E-01	1.32E-01
RA-228	1.25E+00	2.56E-01	1.22E-01
AC-228	1.19E+00	1.26E+00	6.81E-02
TH-228	1.16E+00	3.02E-01	4.10E-01
RA-224	1.20E+00	3.64E-01	5.11E-02
PB-212	1.16E+00	2.53E-01	3.36E-02
BI-212	1.45E+00	3.91E-01	2.70E-01
TL-208	1.12E+00	2.03E-01	5.69E-02
U-235	Not Detected	---	2.24E-01
TH-231	Not Detected	---	2.54E+00
PA-231	Not Detected	---	1.30E+00
TH-227	Not Detected	---	3.78E-01
RA-223	Not Detected	---	1.80E-01
RN-219	Not Detected	---	3.67E-01
PB-211	Not Detected	---	8.38E-01
TL-207	Not Detected	---	1.25E+01
AM-241	Not Detected	---	5.05E-01
PU-239	Not Detected	---	4.30E+02
NP-237	Not Detected	---	2.64E-01
PA-233	Not Detected	---	5.24E-02
TH-229	Not Detected	---	2.74E-01

[Summary Report] - Sample ID: : 60178903

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.97E-02	
AG-110m	Not Detected	---	2.74E-02	
BA-133	Not Detected	---	5.02E-02	
BE-7	Not Detected	---	2.20E-01	
CD-109	~~2.35E+00~~	~~6.35E-01~~	9.08E-01	NOT Detected mec 9/26/96
CD-115	Not Detected	---	9.43E-02	
CE-139	Not Detected	---	2.81E-02	
CE-141	Not Detected	---	5.16E-02	
CE-144	Not Detected	---	2.27E-01	
CO-56	Not Detected	---	1.10E-01	
CO-57	Not Detected	---	3.00E-02	
CO-58	Not Detected	---	2.75E-02	
CO-60	Not Detected	---	3.33E-02	
CR-51	~~5.13E-02~~	~~5.01E-02~~	1.15E-01	NOT Detected mec 9/26/96
CS-134	Not Detected	---	4.02E-02	
CS-137	Not Detected	---	3.17E-02	
EU-152	Not Detected	---	2.25E-01	
EU-154	Not Detected	---	1.79E-01	
EU-155	Not Detected	---	1.35E-01	
FE-59	Not Detected	---	6.72E-02	
GD-153	Not Detected	---	1.08E-01	
HG-203	Not Detected	---	2.73E-02	
I-131	Not Detected	---	2.84E-02	
IR-192	Not Detected	---	2.51E-02	
K-40	1.97E+01	2.77E+00	2.17E-01	
MN-52	Not Detected	---	2.97E-02	
MN-54	Not Detected	---	1.75E-02	
MO-99	Not Detected	---	3.15E-01	
NA-22	Not Detected	---	3.59E-02	
NA-24	Not Detected	---	1.28E-01	
NB-95	Not Detected	---	2.23E-01	
ND-147	Not Detected	---	1.99E-01	
NI-57	~~5.55E-02~~	~~6.30E-02~~	3.86E-02	Not Detected 9/27/96
RU-103	Not Detected	---	1.06E-02	
RU-106	Not Detected	---	2.61E-01	
SB-122	Not Detected	---	5.31E-02	
SB-124	Not Detected	---	2.83E-02	
SB-125	Not Detected	---	7.55E-02	
SR-85	Not Detected	---	3.52E-02	
TA-182	Not Detected	---	1.30E-01	
TA-183	Not Detected	---	5.13E-01	
TC-99m	Not Detected	---	9.50E-01	
TL-201	Not Detected	---	1.95E-01	
XE-133	Not Detected	---	1.71E-01	
Y-88	Not Detected	---	2.67E-02	
ZN-65	Not Detected	---	8.42E-02	
ZR-95	Not Detected	---	5.51E-02	

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-26-96 12:11:11 AM
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Analyzed by: 9/26/96 Reviewed by: 5/27/96

Customer : M.YOUNG/D.BISWELL (6685/SM00)
Customer Sample ID : 031491-005
Lab Sample ID : 60178904

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 784.000 gram
Sample Date/Time : 9-24-96 2:20:00 PM
Acquire Start Date/Time : 9-25-96 10:28:20 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	3.18E+00
TH-234	7.95E-01	3.39E-01	5.21E-01
RA-226	1.26E+00	5.88E-01	5.51E-01
PB-214	4.75E-01	9.39E-02	4.29E-02
BI-214	4.07E-01	9.82E-02	4.04E-02
TH-232	1.07E+00	4.94E-01	1.27E-01
RA-228	1.02E+00	3.42E-01	1.37E-01
AC-228	9.83E-01	5.17E-01	8.08E-02
TH-228	6.95E-01	2.29E-01	4.37E-01
RA-224	9.71E-01	3.23E-01	6.07E-02
PB-212	9.71E-01	2.59E-01	3.55E-02
BI-212	1.21E+00	5.30E-01	3.08E-01
TL-208	Not Detected	---	5.77E-02
U-235	Not Detected	---	2.18E-01
TH-231	Not Detected	---	2.53E+00
PA-231	Not Detected	---	1.35E+00
TH-227	Not Detected	---	3.67E-01
RA-223	Not Detected	---	1.82E-01
RN-219	Not Detected	---	3.60E-01
PB-211	Not Detected	---	8.45E-01
TL-207	Not Detected	---	1.28E+01
AM-241	Not Detected	---	5.06E-01
PU-239	Not Detected	---	4.34E+02
NP-237	Not Detected	---	3.68E-01
PA-233	Not Detected	---	5.48E-02
TH-229	Not Detected	---	2.75E-01

[Summary Report] - Sample ID: : 60178904

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
AG-108m	Not Detected	---	3.92E-02	
AG-110m	Not Detected	---	2.89E-02	
BA-133	Not Detected	---	5.19E-02	
BE-7	Not Detected	---	2.35E-01	
CD-109	~~1.43E+00~~	~~6.34E-01~~	8.74E-01	Not detected-mcc 9/26/96
CD-115	Not Detected	---	9.64E-02	
CE-139	Not Detected	---	2.73E-02	
CE-141	Not Detected	---	5.00E-02	
CE-144	Not Detected	---	2.23E-01	
CO-56	Not Detected	---	1.20E-01	
CO-57	Not Detected	---	3.03E-02	
CO-58	Not Detected	---	2.84E-02	
CO-60	Not Detected	---	3.30E-02	
CR-51	Not Detected	---	2.15E-01	
CS-134	Not Detected	---	4.17E-02	
CS-137	Not Detected	---	3.28E-02	
EU-152	Not Detected	---	2.35E-01	
EU-154	Not Detected	---	1.77E-01	
EU-155	Not Detected	---	1.33E-01	
FE-59	Not Detected	---	6.97E-02	
GD-153	Not Detected	---	1.08E-01	
HG-203	Not Detected	---	2.73E-02	
I-131	Not Detected	---	2.79E-02	
IR-192	Not Detected	---	2.59E-02	
K-40	1.91E+01	2.70E+00	2.17E-01	
MN-52	Not Detected	---	3.32E-02	
MN-54	Not Detected	---	1.87E-02	
MO-99	Not Detected	---	3.11E-01	
NA-22	Not Detected	---	3.83E-02	
NA-24	Not Detected	---	1.36E-01	
NB-95	Not Detected	---	2.20E-01	
ND-147	Not Detected	---	1.93E-01	
NI-57	~~7.14E-02~~	~~4.28E-02~~	3.91E-02	not detected 9/27/96
RU-103	Not Detected	---	2.56E-02	
RU-106	Not Detected	---	2.58E-01	
SB-122	Not Detected	---	5.30E-02	
SB-124	Not Detected	---	2.84E-02	
SB-125	Not Detected	---	7.81E-02	
SR-85	Not Detected	---	3.56E-02	
TA-182	Not Detected	---	1.35E-01	
TA-183	Not Detected	---	5.25E-01	
TC-99m	Not Detected	---	1.11E+00	
TL-201	Not Detected	---	2.01E-01	
XE-133	Not Detected	---	1.74E-01	
Y-88	Not Detected	---	2.42E-02	
ZN-65	Not Detected	---	9.10E-02	
ZR-95	Not Detected	---	5.41E-02	

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [881 Laboratory] *
* 9-26-96 1:56:10 AM *
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* Analyzed by: 9/26/96 Reviewed by: 9/27/96 *
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Customer : M.YOUNG/D.BISWELL (6685/SMO)
Customer Sample ID : 031492-005
Lab Sample ID : 60178905

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 736.000 gram
Sample Date/Time : 9-24-96 2:40:00 PM
Acquire Start Date/Time : 9-26-96 12:13:22 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	2.86E+00
TH-234	6.52E-01	3.60E-01	4.65E-01
RA-226	1.02E+00	4.91E-01	4.67E-01
PB-214	4.71E-01	1.03E-01	4.10E-02
BI-214	4.14E-01	8.77E-02	4.21E-02
TH-232	6.42E-01	9.09E-01	1.21E-01
RA-228	7.29E-01	3.60E-01	1.19E-01
AC-228	6.53E-01	1.66E-01	6.45E-02
TH-228	4.26E-01	1.93E-01	4.26E-01
RA-224	7.01E-01	2.11E-01	6.28E-02
PB-212	5.95E-01	1.31E-01	3.31E-02
BI-212	8.52E-01	3.02E-01	2.68E-01
TL-208	5.87E-01	9.93E-02	5.37E-02
U-235	Not Detected	---	1.97E-01
TH-231	Not Detected	---	2.27E+00
PA-231	Not Detected	---	1.22E+00
TH-227	Not Detected	---	3.11E-01
RA-223	Not Detected	---	1.65E-01
RN-219	~~2.59E-01~~	~~2.91E-01~~	~~3.33E-01~~ NOT Detected mac 9/26/96
PB-211	Not Detected	---	7.62E-01
TL-207	Not Detected	---	1.17E+01
AM-241	Not Detected	---	4.61E-01
PU-239	Not Detected	---	3.88E+02
NP-237	Not Detected	---	2.20E-01
PA-233	Not Detected	---	5.01E-02
TH-229	Not Detected	---	2.47E-01

[Summary Report] - Sample ID: : 60178905

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.63E-02
AG-110m	Not Detected	---	2.68E-02
BA-133	Not Detected	---	5.11E-02
BE-7	Not Detected	---	2.09E-01
CD-109	~~6.15E-01~~	~~5.18E-01~~	7.56E-01 NOT Detected mec 9/26/96
CD-115	Not Detected	---	8.71E-02
CE-139	Not Detected	---	2.55E-02
CE-141	Not Detected	---	4.49E-02
CE-144	Not Detected	---	2.04E-01
CO-56	Not Detected	---	1.28E-01
CO-57	Not Detected	---	2.71E-02
CO-58	Not Detected	---	2.82E-02
CO-60	Not Detected	---	3.20E-02
CR-51	Not Detected	---	2.01E-01
CS-134	Not Detected	---	4.19E-02
CS-137	1.20E-02	1.01E-02	1.47E-02
EU-152	Not Detected	---	2.14E-01
EU-154	Not Detected	---	1.63E-01
EU-155	Not Detected	---	1.19E-01
FE-59	Not Detected	---	6.35E-02
GD-153	Not Detected	---	9.61E-02
HG-203	Not Detected	---	2.47E-02
I-131	Not Detected	---	2.75E-02
IR-192	Not Detected	---	2.39E-02
K-40	1.36E+01	2.06E+00	2.24E-01
MN-52	Not Detected	---	2.93E-02
MN-54	Not Detected	---	2.94E-02
MO-99	Not Detected	---	3.06E-01
NA-22	Not Detected	---	3.68E-02
NA-24	Not Detected	---	1.47E-01
NB-95	Not Detected	---	1.89E-01
ND-147	Not Detected	---	1.83E-01
NI-57	Not Detected	---	3.42E-02
RU-103	Not Detected	---	2.36E-02
RU-106	Not Detected	---	2.46E-01
SB-122	Not Detected	---	4.98E-02
SB-124	Not Detected	---	2.85E-02
SB-125	Not Detected	---	7.02E-02
SR-85	Not Detected	---	3.33E-02
TA-182	Not Detected	---	1.29E-01
TA-183	Not Detected	---	4.82E-01
TC-99m	Not Detected	---	1.20E+00
TL-201	Not Detected	---	1.88E-01
XE-133	Not Detected	---	1.63E-01
Y-88	Not Detected	---	2.58E-02
ZN-65	Not Detected	---	8.53E-02
ZR-95	Not Detected	---	5.07E-02

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-26-96 3:41:00 AM
*
****

* Analyzed by: 9/26/96 Reviewed by: 9/26/96 *

Customer : M.YOUNG/D.BISWELL (6685/SMO)
Customer Sample ID : 031493-005
Lab Sample ID : 60178906

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 825.000 gram
Sample Date/Time : 9-24-96 2:35:00 PM
Acquire Start Date/Time : 9-26-96 1:58:18 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	2.68E+00	
TH-234	Not Detected	---	6.23E-01	
RA-226	1.12E+00	5.34E-01	4.66E-01	
PB-214	3.86E-01	5.77E-02	3.93E-02	
BI-214	3.85E-01	8.04E-02	3.58E-02	
TH-232	5.83E-01	2.85E-01	1.18E-01	
RA-228	5.16E-01	1.54E-01	1.25E-01	
AC-228	5.95E-01	1.69E-01	7.17E-02	
TH-228	5.36E-01	1.90E-01	3.67E-01	
RA-224	6.26E-01	2.02E-01	5.44E-02	
PB-212	5.78E-01	1.05E-01	3.13E-02	
BI-212	7.17E-01	8.41E-01	2.62E-01	
TL-208	5.53E-01	1.36E-01	5.76E-02	
U-235	~~7.83E-02~~	~~1.49E-01~~	1.92E-01	NOT Detected mec 9/26/96
TH-231	Not Detected	---	2.15E+00	
PA-231	Not Detected	---	1.17E+00	
TH-227	Not Detected	---	2.90E-01	
RA-223	Not Detected	---	1.55E-01	
RN-219	Not Detected	---	3.07E-01	
PB-211	Not Detected	---	7.14E-01	
TL-207	Not Detected	---	1.06E+01	
AM-241	Not Detected	---	4.37E-01	
PU-239	Not Detected	---	3.71E+02	
NP-237	Not Detected	---	3.09E-01	
PA-233	Not Detected	---	4.79E-02	
TH-229	Not Detected	---	2.30E-01	

[Summary Report] - Sample ID: : 60178906

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.22E-02
AG-110m	Not Detected	---	3.56E-02
BA-133	Not Detected	---	4.63E-02
BE-7	Not Detected	---	2.08E-01
CD-109	~~8.24E-01~~	~~4.52E-01~~	6.46E-01 Not detected mec 9/26/96
CD-115	Not Detected	---	8.36E-02
CE-139	Not Detected	---	2.39E-02
CE-141	Not Detected	---	4.38E-02
CE-144	Not Detected	---	1.98E-01
CO-56	Not Detected	---	1.14E-01
CO-57	Not Detected	---	2.60E-02
CO-58	Not Detected	---	2.54E-02
CO-60	Not Detected	---	2.98E-02
CR-51	Not Detected	---	1.89E-01
CS-134	Not Detected	---	3.95E-02
CS-137	1.25E-01	2.90E-02	1.87E-02
EU-152	Not Detected	---	2.00E-01
EU-154	Not Detected	---	1.46E-01
EU-155	Not Detected	---	1.11E-01
FE-59	Not Detected	---	5.91E-02
GD-153	Not Detected	---	9.15E-02
HG-203	Not Detected	---	1.62E-02
I-131	Not Detected	---	2.55E-02
IR-192	Not Detected	---	2.22E-02
K-40	1.41E+01	2.06E+00	2.08E-01
MN-52	Not Detected	---	3.11E-02
MN-54	Not Detected	---	2.71E-02
MO-99	Not Detected	---	2.93E-01
NA-22	Not Detected	---	3.50E-02
NA-24	Not Detected	---	1.45E-01
NB-95	Not Detected	---	1.78E-01
ND-147	Not Detected	---	1.68E-01
NI-57	Not Detected	---	7.52E-02
RU-103	Not Detected	---	2.29E-02
RU-106	Not Detected	---	2.31E-01
SB-122	Not Detected	---	4.75E-02
SB-124	Not Detected	---	2.71E-02
SB-125	Not Detected	---	7.02E-02
SR-85	Not Detected	---	3.01E-02
TA-182	Not Detected	---	1.23E-01
TA-183	Not Detected	---	4.62E-01
TC-99m	Not Detected	---	1.41E+00
TL-201	Not Detected	---	1.74E-01
XE-133	Not Detected	---	1.58E-01
Y-88	Not Detected	---	2.09E-02
ZN-65	Not Detected	---	8.11E-02
ZR-95	Not Detected	---	4.73E-02

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [881 Laboratory]
9-26-96 9:47:23 AM
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*
* Analyzed by: 9/26/96 Reviewed by: 9/27/96
****

Customer : M. YOUNG/D. BISWELL (6685/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 60178907

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 9-26-96 9:35:20 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.28E+04
TH-234	Not Detected	---	4.73E+03
RA-226	Not Detected	---	6.40E+03
PB-214	Not Detected	---	6.37E+02
BI-214	Not Detected	---	5.98E+02
TH-232	Not Detected	---	2.01E+03
RA-228	Not Detected	---	2.74E+03
AC-228	Not Detected	---	1.56E+03
TH-228	Not Detected	---	5.45E+04
RA-224	Not Detected	---	2.19E+03
PB-212	Not Detected	---	4.07E+03
BI-212	Not Detected	---	3.68E+04
TL-208	Not Detected	---	7.76E+03
U-235	Not Detected	---	1.77E+03
TH-231	Not Detected	---	1.75E+04
PA-231	Not Detected	---	1.35E+04
TH-227	Not Detected	---	2.29E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.33E+03
PB-211	Not Detected	---	1.21E+04
TL-207	Not Detected	---	2.12E+05
AM-241	9.01E+04	1.63E+04	3.71E+03
PU-239	Not Detected	---	3.36E+06
NP-237	Not Detected	---	2.55E+03
PA-233	Not Detected	---	5.82E+02
TH-229	Not Detected	---	2.10E+03

[Summary Report] - Sample ID: : 60178907

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.33E+02
AG-110m	Not Detected	---	5.99E+05
BA-133	Not Detected	---	5.64E+02
BE-7	Not Detected	---	4.81E+15
CD-109	3.66E+05	1.43E+05	1.50E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	1.22E+07
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	3.46E+05
CO-56	Not Detected	---	9.45E+10
CO-57	Not Detected	---	6.19E+04
CO-58	Not Detected	---	4.94E+11
CO-60	7.50E+04	9.96E+03	3.16E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	2.08E+03
CS-137	6.69E+04	8.72E+03	2.59E+02
EU-152	Not Detected	---	3.37E+03
EU-154	Not Detected	---	2.34E+03
EU-155	Not Detected	---	2.49E+03
FE-59	Not Detected	---	3.25E+17
GD-153	Not Detected	---	3.88E+05
HG-203	Not Detected	---	2.14E+16
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.69E+11
K-40	Not Detected	---	1.55E+03
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	4.34E+04
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.05E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
RU-103	Not Detected	---	1.08E+19
RU-106	Not Detected	---	1.65E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	1.72E+13
SB-125	Not Detected	---	4.68E+03
SR-85	Not Detected	---	3.41E+12
TA-182	Not Detected	---	5.62E+08
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	1.87E+08
ZN-65	Not Detected	---	4.19E+05
ZR-95	Not Detected	---	7.83E+12

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
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Report Date : 9-26-96 9:47:58 AM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : GLS
Sample ID : 60178907
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 9-26-96 9:35:20 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	9.247E-02	3.928E-03	9.008E-02	< : : : >
CS-137 Activity	6.829E-02	1.965E-03	6.691E-02	< : : : >
CO-60 Activity	7.483E-02	1.525E-03	7.445E-02	< : : : >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 9/26/96

Feature 8PP/8RR

ON-SITE LABORATORY (RPSD)
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2

Internal Lab: ~~MA~~ 400185 Batch No. | SAR/WR No. | AR/COC 607177

Dept. No./Mail Stop:	6133/MS 1088	Date Samples Shipped:	2/10/04 SMO USE	Logged By:	
Project/Task Manager:	Paul Freshour (pfresh)	Carrier/Waybill No.	HC	Project/Task No.:	7213_02.02.01
Project Name:	SWMU 8	Lab Contact:	Kathye Chavez/844-7086	SMO Authorization:	
Record Center Code:		Lab Destination:	RPSD	Location:	Tech Area:
Logbook Ref. No.:		SMO Contact/Phone:	Doug Perry/845-0867	Building:	Room:
Service Order No.:	CF047-04				

☐ Characterization Only
☑ Waste Characterization
-RCRA Date = _____
-Send preliminary/copy report to:

☐ Release to ERCL On-Site Lab
☐ Release to Off-Site Lab
-This COC Number Releases
COC No(s).:_____

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time(hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Analysis Request
064112-003	AOB8-GR-401-0.0-S	0.0	SWMU 8	020904/1422	S	M	500ml	None	G	SA	
01	697.9										Gamma Spec
064113-003	AOB8-GR-402-0.0-S	0.0	SWMU 8	020904/1425	S	M	500ml	None	G	SA	Gamma Spec
02	596.9										
064114-003	AOB8-GR-403-0.0-S	0.0	SWMU 8	020904/1428	S	M	500ml	None	G	SA	Gamma Spec
03	685.8										
064115-003	AOB8-GR-404-0.0-S	0.0	SWMU 8	020904/1431	S	M	500ml	None	G	SA	Gamma Spec
04	726.3										

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by Lab	Date Entered(mm/dd/yy)	02/25/04
Turnaround Time	☑ Normal ☐ Rush	Entered by:	JMC
	Required Report Date	QC Inits.	WSF

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Raw Data Package ☑ Yes ☐ No
*Heads Up: More samples to follow.
*Please send report to:
ED Mignardot/6133/284-3733 MS 1088
~300 cpm
Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson		WJG	Weston/6133/284-5232
	Gilbert Quintana		GQ	Shaw/6133/284-3309

1.Relinquished by		Org. 6134	Date 2-10-04	Time 0910	4.Relinquished by	Org. 6133	Date 2/16/04 Time 0750
1. Received by	SMO	Org. 6133	Date 2-10-04	Time 0910	4. Received by	Org. 6133	Date 2/16/04 Time 0750
2.Relinquished by	SMO	Org. 6133	Date 2-10-04	Time 1545	5.Relinquished by	Org.	Date	Time
2. Received by		Org. 3123	Date 2-10-04	Time 1545	5. Received by	Org.	Date	Time
3.Relinquished by		Org. 3123	Date 2-12-04	Time 1450	6.Relinquished by	Org.	Date	Time
3. Received by	SMO	Org. 6133	Date 2-12-04	Time 1450	6. Received by	Org.	Date	Time

ON-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 607177

Project Name: SWMU 8 | Project/Task Manger: Paul Freshour | Case No: 7213 .02.02.01

Sample No.-Fraction / RPSD No.-Fraction	ER Sample ID or Sample Location Detail / RPSD Remarks/Aliquot Amounts	Beginning Depth (ft) / Screen CPM	ER Site No. / Sample Mass	Date/Time (hr) Collected / Sample Quantity	Reference LOV(available at SMO) Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Analysis Request
064116-003	AOB8-GR-405-0.0-S	0.0	SWMU 8	020904/1434	S	M	500ml	None	G	SA	Gamma Spec
05	679.9										
064117-003	AOB8-GR-406-0.0-S	0.0	SWMU 8	020904/1437	S	M	500ml	None	G	SA	Gamma Spec
06	719.4										
064118-003	AOB8-GR-407-0.0-S	0.0	SWMU 8	020904/1440	S	M	500ml	None	G	SA	Gamma Spec
07	716.4										
064119-003	AOB8-GR-408-0.0-S	0.0	SWMU 8	020904/1443	S	M	500ml	None	G	SA	Gamma Spec
08	713.4										
064120-003	AOB8-GR-409-0.0-S	0.0	SWMU 8	020904/1446	S	M	500ml	None	G	SA	Gamma Spec
09	675.5										
064121-003	AOB8-GR-410-0.0-S	0.0	SWMU 8	020904/1449	S	M	500ml	None	G	SA	Gamma Spec
10	733.6										
064121-005	AOB8-GR-411-0.0-DU	0.0	SWMU 8	020904/1449	S	M	500ml	None	G	DU	Gamma Spec
11	682.9										
12	LABOS Count BLK	—	—	—							X —
13	LCS LABOS										X

Abnormal Conditions on Receipt

LAB USE

Recipient Initials_____

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* 2/11/04 11:43:15 AM *
****
*
* Analyzed by: R.T. Preston 2/11/04 Reviewed by: [signature] 2-12-04 *
****

Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064112-003
Lab Sample ID : 40018501
Sample Description : AOB8-GR-401-0.0-S
Sample Quantity : 697.900 gram
Sample Date/Time : 2/09/04 2:22:00 PM
Acquire Start Date/Time : 2/11/04 10:02:58 AM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.34E-001
RA-226	1.90E+000	5.60E-001	7.32E-001
PB-214	7.73E-001	1.22E-001	8.64E-002
BI-214	7.21E-001	1.19E-001	6.33E-002
PB-210	Not Detected	---	2.36E+001
TH-232	7.55E-001	3.79E-001	2.75E-001
RA-228	8.34E-001	1.69E-001	1.63E-001
AC-228	7.80E-001	1.64E-001	1.33E-001
TH-228	7.58E-001	4.97E-001	7.60E-001
RA-224	9.96E-001	2.28E-001	4.74E-002
PB-212	7.87E-001	1.17E-001	4.40E-002
BI-212	7.97E-001	3.21E-001	4.31E-001
TL-208	6.51E-001	1.27E-001	1.14E-001
U-235	Not Detected	---	2.39E-001
TH-231	Not Detected	---	9.60E+000
PA-231	Not Detected	---	1.59E+000
TH-227	Not Detected	---	4.06E-001
RA-223	Not Detected	---	1.74E-001
RN-219	Not Detected	---	4.47E-001
PB-211	Not Detected	---	1.00E+000
TL-207	Not Detected	---	1.60E+001
AM-241	Not Detected	---	2.55E-001
PU-239	Not Detected	---	4.05E+002
NP-237	Not Detected	---	2.14E+000
PA-233	Not Detected	---	6.27E-002
TH-229	Not Detected	---	2.24E-001

[Summary Report] - Sample ID: : 40018501

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.80E-002
AG-110m	Not Detected	---------	3.40E-002
BA-133	Not Detected	---------	6.60E-002
BE-7	Not Detected	---------	2.83E-001
CD-115	Not Detected	---------	1.30E-001
CE-139	Not Detected	---------	2.96E-002
CE-141	Not Detected	---------	5.48E-002
CE-144	Not Detected	---------	2.16E-001
CM-243	Not Detected	---------	1.87E-001
CO-56	Not Detected	---------	4.17E-002
CO-57	Not Detected	---------	2.75E-002
CO-58	Not Detected	---------	3.66E-002
CO-60	Not Detected	---------	4.26E-002
CR-51	Not Detected	---------	2.65E-001
CS-134	Not Detected	---------	6.48E-002
CS-137	Not Detected	---------	3.80E-002
EU-152	Not Detected	---------	8.22E-002
EU-154	Not Detected	---------	2.10E-001
EU-155	Not Detected	---------	1.29E-001
FE-59	Not Detected	---------	8.71E-002
GD-153	Not Detected	---------	9.19E-002
HG-203	Not Detected	---------	3.49E-002
I-131	Not Detected	---------	3.69E-002
IR-192	Not Detected	---------	2.98E-002
K-40	1.33E+001	1.87E+000	4.49E-001
MN-52	Not Detected	---------	4.61E-002
MN-54	Not Detected	---------	3.99E-002
MO-99	Not Detected	---------	4.41E-001
NA-22	Not Detected	---------	5.08E-002
NA-24	Not Detected	---------	3.04E-001
ND-147	Not Detected	---------	2.46E-001
NI-57	Not Detected	---------	1.34E-001
RH-101	Not Detected	---------	3.44E-002
RH-102m	Not Detected	---------	3.09E-002
RU-103	Not Detected	---------	3.26E-002
RU-106	Not Detected	---------	3.33E-001
SB-122	Not Detected	---------	6.92E-002
SB-124	Not Detected	---------	3.71E-002
SB-125	Not Detected	---------	9.13E-002
SN-113	Not Detected	---------	4.36E-002
SR-85	Not Detected	---------	4.03E-002
TA-182	Not Detected	---------	1.72E-001
TA-183	Not Detected	---------	2.74E-001
TL-201	Not Detected	---------	1.52E-001
Y-88	Not Detected	---------	3.62E-002
ZN-65	Not Detected	---------	1.20E-001
ZR-95	Not Detected	---------	6.24E-002

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

2/11/04 1:25:02 PM

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Analyzed by: RT Preston 2/11/04 Reviewed by: Jim Pike 2-12-04

****

Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064113-003
Lab Sample ID : 40018502
Sample Description : AOB8-GR-402-0.0-S
Sample Quantity : 596.900 gram
Sample Date/Time : 2/09/04 2:25:00 PM
Acquire Start Date/Time : 2/11/04 11:44:49 AM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)	
U-238	Not Detected	---	8.31E-001	
RA-226	1.98E+000	8.73E-001	1.29E+000	
PB-214	9.90E-001	1.52E-001	9.80E-002	
BI-214	8.24E-001	1.40E-001	8.82E-002	
PB-210	Not Detected	---	2.69E+001	
TH-232	1.07E+000	5.02E-001	2.47E-001	
RA-228	1.08E+000	2.12E-001	1.92E-001	
AC-228	9.67E-001	1.95E-001	1.41E-001	
TH-228	9.13E-001	4.83E-001	7.12E-001	
RA-224	1.14E+000	2.70E-001	1.23E-001	
PB-212	1.00E+000	1.48E-001	5.52E-002	
BI-212	7.70E-001	3.38E-001	4.62E-001	
TL-208	7.89E-001	1.58E-001	1.52E-001	
U-235	Not Detected	---	2.77E-001	
TH-231	Not Detected	---	1.13E+001	
PA-231	Not Detected	---	1.75E+000	
TH-227	Not Detected	---	4.80E-001	
RA-223	Not Detected	---	2.04E-001	
RN-219	~~4.94E-001~~	~~4.02E-001~~	5.12E-001	Not detected RT Preston 2/11/04
PB-211	Not Detected	---	1.14E+000	
TL-207	Not Detected	---	1.90E+001	
AM-241	Not Detected	---	2.99E-001	
PU-239	Not Detected	---	4.54E+002	
NP-237	Not Detected	---	2.54E+000	
PA-233	Not Detected	---	7.10E-002	
TH-229	Not Detected	---	2.66E-001	

[Summary Report] - Sample ID: : 40018502

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	7.12E-002
AG-110m	Not Detected	---	3.99E-002
BA-133	Not Detected	---	7.92E-002
BE-7	Not Detected	---	3.10E-001
CD-115	Not Detected	---	1.56E-001
CE-139	Not Detected	---	3.45E-002
CE-141	Not Detected	---	6.29E-002
CE-144	Not Detected	---	2.47E-001
CM-243	Not Detected	---	2.20E-001
CO-56	Not Detected	---	5.00E-002
CO-57	Not Detected	---	3.12E-002
CO-58	Not Detected	---	4.35E-002
CO-60	Not Detected	---	5.23E-002
CR-51	Not Detected	---	3.13E-001
CS-134	Not Detected	---	7.53E-002
CS-137	Not Detected	---	4.36E-002
EU-152	Not Detected	---	9.31E-002
EU-154	Not Detected	---	2.45E-001
EU-155	Not Detected	---	1.47E-001
FE-59	Not Detected	---	9.89E-002
GD-153	Not Detected	---	1.07E-001
HG-203	Not Detected	---	4.10E-002
I-131	Not Detected	---	4.42E-002
IR-192	Not Detected	---	3.59E-002
K-40	1.59E+001	2.22E+000	4.14E-001
MN-52	Not Detected	---	5.09E-002
MN-54	Not Detected	---	4.45E-002
MO-99	Not Detected	---	5.26E-001
NA-22	Not Detected	---	5.85E-002
NA-24	Not Detected	---	3.67E-001
ND-147	Not Detected	---	2.92E-001
NI-57	Not Detected	---	1.74E-001
RH-101	Not Detected	---	4.06E-002
RH-102m	Not Detected	---	3.28E-002
RU-103	Not Detected	---	3.82E-002
RU-106	Not Detected	---	3.74E-001
SB-122	Not Detected	---	7.94E-002
SB-124	Not Detected	---	4.37E-002
SB-125	Not Detected	---	1.15E-001
SN-113	Not Detected	---	4.84E-002
SR-85	Not Detected	---	4.85E-002
TA-182	Not Detected	---	2.07E-001
TA-183	Not Detected	---	3.26E-001
TL-201	Not Detected	---	1.91E-001
Y-88	Not Detected	---	3.84E-002
ZN-65	Not Detected	---	1.43E-001
ZR-95	Not Detected	---	7.88E-002

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* 2/11/04 3:06:48 PM *
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*
* Analyzed by: R. Preston 2/11/04 Reviewed by: 2-12-04 *
****

Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064114-003
Lab Sample ID : 40018503
Sample Description : AOB8-GR-403-0.0-S
Sample Quantity : 685.800 gram
Sample Date/Time : 2/09/04 2:28:00 PM
Acquire Start Date/Time : 2/11/04 1:26:35 PM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.93E-001
RA-226	1.78E+000	7.34E-001	1.07E+000
PB-214	8.47E-001	1.37E-001	1.07E-001
BI-214	7.07E-001	1.24E-001	8.80E-002
PB-210	Not Detected	---	2.34E+001
TH-232	7.95E-001	3.85E-001	2.34E-001
RA-228	8.30E-001	1.71E-001	1.77E-001
AC-228	7.67E-001	1.63E-001	1.34E-001
TH-228	8.21E-001	3.73E-001	5.27E-001
RA-224	9.23E-001	2.27E-001	1.33E-001
PB-212	8.16E-001	1.21E-001	4.50E-002
BI-212	8.72E-001	3.05E-001	3.80E-001
TL-208	7.51E-001	1.46E-001	1.35E-001
U-235	Not Detected	---	2.39E-001
TH-231	Not Detected	---	9.65E+000
PA-231	Not Detected	---	1.51E+000
TH-227	Not Detected	---	4.10E-001
RA-223	Not Detected	---	1.77E-001
RN-219	Not Detected	---	4.40E-001
PB-211	Not Detected	---	9.75E-001
TL-207	Not Detected	---	1.62E+001
AM-241	Not Detected	---	2.53E-001
PU-239	Not Detected	---	4.04E+002
NP-237	Not Detected	---	2.16E+000
PA-233	Not Detected	---	6.04E-002
TH-229	Not Detected	---	2.32E-001

[Summary Report] - Sample ID: : 40018503

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.95E-002
AG-110m	Not Detected	---------	3.52E-002
BA-133	Not Detected	---------	6.86E-002
BE-7	Not Detected	---------	2.84E-001
CD-115	Not Detected	---------	1.37E-001
CE-139	Not Detected	---------	3.00E-002
CE-141	Not Detected	---------	5.36E-002
CE-144	Not Detected	---------	2.23E-001
CM-243	Not Detected	---------	1.92E-001
CO-56	Not Detected	---------	4.10E-002
CO-57	Not Detected	---------	2.86E-002
CO-58	Not Detected	---------	3.52E-002
CO-60	Not Detected	---------	4.36E-002
CR-51	Not Detected	---------	2.71E-001
CS-134	Not Detected	---------	6.42E-002
CS-137	Not Detected	---------	3.98E-002
EU-152	Not Detected	---------	8.50E-002
EU-154	Not Detected	---------	2.15E-001
EU-155	Not Detected	---------	1.29E-001
FE-59	Not Detected	---------	7.90E-002
GD-153	Not Detected	---------	9.17E-002
HG-203	Not Detected	---------	3.51E-002
I-131	Not Detected	---------	3.70E-002
IR-192	Not Detected	---------	2.97E-002
K-40	1.27E+001	1.80E+000	3.94E-001
MN-52	Not Detected	---------	4.47E-002
MN-54	Not Detected	---------	4.05E-002
MO-99	Not Detected	---------	4.39E-001
NA-22	Not Detected	---------	5.05E-002
NA-24	Not Detected	---------	3.56E-001
ND-147	Not Detected	---------	2.43E-001
NI-57	Not Detected	---------	1.62E-001
RH-101	Not Detected	---------	3.48E-002
RH-102m	Not Detected	---------	3.11E-002
RU-103	Not Detected	---------	3.29E-002
RU-106	Not Detected	---------	3.13E-001
SB-122	Not Detected	---------	7.16E-002
SB-124	Not Detected	---------	3.78E-002
SB-125	Not Detected	---------	9.30E-002
SN-113	Not Detected	---------	4.22E-002
SR-85	Not Detected	---------	4.16E-002
TA-182	Not Detected	---------	1.80E-001
TA-183	Not Detected	---------	2.83E-001
TL-201	Not Detected	---------	1.66E-001
Y-88	Not Detected	---------	3.97E-002
ZN-65	Not Detected	---------	1.26E-001
ZR-95	Not Detected	---------	6.82E-002

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* 2/11/04 4:48:36 PM *
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* Analyzed by: RT Preuss 2/12/04 Reviewed by: [signature] 2-12-04 *

Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064115-003
Lab Sample ID : 40018504
Sample Description : AOB8-GR-404-0.0-S
Sample Quantity : 726.300 gram
Sample Date/Time : 2/09/04 2:31:00 PM
Acquire Start Date/Time : 2/11/04 3:08:22 PM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.90E-001
RA-226	1.99E+000	6.43E-001	8.80E-001
PB-214	7.73E-001	1.21E-001	8.49E-002
BI-214	7.67E-001	1.30E-001	8.72E-002
PB-210	Not Detected	---	7.68E+001
TH-232	8.94E-001	4.15E-001	1.78E-001
RA-228	7.72E-001	1.61E-001	1.73E-001
AC-228	7.64E-001	1.57E-001	1.19E-001
TH-228	6.89E-001	4.72E-001	7.26E-001
RA-224	1.04E+000	2.36E-001	6.34E-002
PB-212	8.33E-001	1.22E-001	4.34E-002
BI-212	9.65E-001	3.15E-001	3.85E-001
TL-208	7.71E-001	1.35E-001	9.79E-002
U-235	Not Detected	---	2.34E-001
TH-231	Not Detected	---	1.01E+001
PA-231	Not Detected	---	1.53E+000
TH-227	Not Detected	---	4.02E-001
RA-223	Not Detected	---	1.79E-001
RN-219	Not Detected	---	4.16E-001
PB-211	Not Detected	---	9.33E-001
TL-207	Not Detected	---	1.62E+001
AM-241	Not Detected	---	4.49E-001
PU-239	Not Detected	---	3.99E+002
NP-237	Not Detected	---	2.16E+000
PA-233	Not Detected	---	6.08E-002
TH-229	Not Detected	---	2.19E-001

[Summary Report] - Sample ID: : 40018504

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.79E-002
AG-110m	Not Detected	---------	3.38E-002
BA-133	Not Detected	---------	6.39E-002
BE-7	Not Detected	---------	2.62E-001
CD-115	Not Detected	---------	1.40E-001
CE-139	Not Detected	---------	2.87E-002
CE-141	Not Detected	---------	5.32E-002
CE-144	Not Detected	---------	2.14E-001
CM-243	Not Detected	---------	1.79E-001
CO-56	Not Detected	---------	3.75E-002
CO-57	Not Detected	---------	2.67E-002
CO-58	Not Detected	---------	3.46E-002
CO-60	Not Detected	---------	4.14E-002
CR-51	Not Detected	---------	2.63E-001
CS-134	Not Detected	---------	6.29E-002
CS-137	Not Detected	---------	3.72E-002
EU-152	Not Detected	---------	8.03E-002
EU-154	Not Detected	---------	2.09E-001
EU-155	Not Detected	---------	1.29E-001
FE-59	Not Detected	---------	8.15E-002
GD-153	Not Detected	---------	8.93E-002
HG-203	Not Detected	---------	3.36E-002
I-131	Not Detected	---------	3.75E-002
IR-192	Not Detected	---------	2.95E-002
K-40	1.33E+001	1.87E+000	3.75E-001
MN-52	Not Detected	---------	4.79E-002
MN-54	Not Detected	---------	3.84E-002
MO-99	Not Detected	---------	4.52E-001
NA-22	Not Detected	---------	4.94E-002
NA-24	Not Detected	---------	3.75E-001
ND-147	Not Detected	---------	2.33E-001
NI-57	Not Detected	---------	1.41E-001
RH-101	Not Detected	---------	3.47E-002
RH-102m	Not Detected	---------	2.93E-002
RU-103	Not Detected	---------	3.30E-002
RU-106	Not Detected	---------	3.27E-001
SB-122	Not Detected	---------	7.28E-002
SB-124	Not Detected	---------	3.58E-002
SB-125	Not Detected	---------	9.34E-002
SN-113	Not Detected	---------	4.00E-002
SR-85	Not Detected	---------	4.00E-002
TA-182	Not Detected	---------	1.78E-001
TA-183	Not Detected	---------	5.14E-001
TL-201	Not Detected	---------	1.87E-001
Y-88	Not Detected	---------	3.19E-002
ZN-65	Not Detected	---------	1.22E-001
ZR-95	Not Detected	---------	6.24E-002

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

2/11/04 6:30:22 PM

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Analyzed by: RTPreston 2/12/04 Reviewed by: [signature] 2-12-04

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Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064116-003
Lab Sample ID : 40018505
Sample Description : AOB8-GR-405-0.0-S
Sample Quantity : 679.900 gram
Sample Date/Time : 2/09/04 2:34:00 PM
Acquire Start Date/Time : 2/11/04 4:50:09 PM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.98E-001
RA-226	1.59E+000	5.84E-001	8.23E-001
PB-214	7.30E-001	1.25E-001	1.10E-001
BI-214	5.83E-001	1.01E-001	5.92E-002
PB-210	Not Detected	---	2.23E+001
TH-232	8.15E-001	4.09E-001	2.97E-001
RA-228	7.64E-001	1.63E-001	1.69E-001
AC-228	7.04E-001	1.50E-001	1.19E-001
TH-228	6.01E-001	3.71E-001	5.58E-001
RA-224	1.02E+000	2.41E-001	1.15E-001
PB-212	8.40E-001	1.24E-001	4.41E-002
BI-212	1.08E+000	4.49E-001	6.29E-001
TL-208	7.41E-001	1.32E-001	9.74E-002
U-235	Not Detected	---	2.40E-001
TH-231	Not Detected	---	9.70E+000
PA-231	Not Detected	---	1.52E+000
TH-227	Not Detected	---	4.06E-001
RA-223	Not Detected	---	1.78E-001
RN-219	Not Detected	---	4.48E-001
PB-211	Not Detected	---	1.01E+000
TL-207	Not Detected	---	1.53E+001
AM-241	Not Detected	---	2.47E-001
PU-239	Not Detected	---	4.06E+002
NP-237	Not Detected	---	2.20E+000
PA-233	Not Detected	---	6.15E-002
TH-229	Not Detected	---	2.23E-001

[Summary Report] - Sample ID: : 40018505

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.63E-002
AG-110m	Not Detected	---------	3.63E-002
BA-133	Not Detected	---------	6.61E-002
BE-7	Not Detected	---------	2.90E-001
CD-115	Not Detected	---------	1.42E-001
CE-139	Not Detected	---------	3.01E-002
CE-141	Not Detected	---------	5.44E-002
CE-144	Not Detected	---------	2.23E-001
CM-243	Not Detected	---------	1.94E-001
CO-56	Not Detected	---------	3.97E-002
CO-57	Not Detected	---------	2.87E-002
CO-58	Not Detected	---------	3.52E-002
CO-60	Not Detected	---------	4.36E-002
CR-51	Not Detected	---------	2.67E-001
CS-134	Not Detected	---------	6.00E-002
CS-137	Not Detected	---------	3.87E-002
EU-152	Not Detected	---------	8.66E-002
EU-154	Not Detected	---------	2.13E-001
EU-155	Not Detected	---------	1.31E-001
FE-59	Not Detected	---------	7.90E-002
GD-153	Not Detected	---------	8.93E-002
HG-203	Not Detected	---------	3.56E-002
I-131	Not Detected	---------	3.94E-002
IR-192	Not Detected	---------	3.05E-002
K-40	1.31E+001	1.85E+000	4.28E-001
MN-52	Not Detected	---------	4.64E-002
MN-54	Not Detected	---------	3.73E-002
MO-99	Not Detected	---------	4.67E-001
NA-22	Not Detected	---------	4.90E-002
NA-24	Not Detected	---------	4.59E-001
ND-147	Not Detected	---------	2.45E-001
NI-57	Not Detected	---------	1.67E-001
RH-101	Not Detected	---------	3.33E-002
RH-102m	Not Detected	---------	3.08E-002
RU-103	Not Detected	---------	3.29E-002
RU-106	Not Detected	---------	3.41E-001
SB-122	Not Detected	---------	7.43E-002
SB-124	Not Detected	---------	3.65E-002
SB-125	Not Detected	---------	9.38E-002
SN-113	Not Detected	---------	4.15E-002
SR-85	Not Detected	---------	4.29E-002
TA-182	Not Detected	---------	1.68E-001
TA-183	Not Detected	---------	2.83E-001
TL-201	Not Detected	---------	1.69E-001
Y-88	Not Detected	---------	3.33E-002
ZN-65	Not Detected	---------	1.14E-001
ZR-95	Not Detected	---------	6.34E-002

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* 2/11/04 8:12:07 PM *
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* Analyzed by: R. Preston 2/12/04 Reviewed by: [signature] 2-12-04 *

Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064117-003
Lab Sample ID : 40018506
Sample Description : AOB8-GR-406-0.0-S
Sample Quantity : 719.400 gram
Sample Date/Time : 2/09/04 2:37:00 PM
Acquire Start Date/Time : 2/11/04 6:31:55 PM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.48E-001	3.11E-001	5.37E-001
RA-226	1.62E+000	5.96E-001	8.42E-001
PB-214	8.02E-001	1.22E-001	7.29E-002
BI-214	7.83E-001	1.29E-001	7.32E-002
PB-210	Not Detected	---	2.20E+001
TH-232	8.62E-001	4.17E-001	2.58E-001
RA-228	8.43E-001	1.71E-001	1.79E-001
AC-228	8.64E-001	1.73E-001	1.25E-001
TH-228	6.71E-001	4.47E-001	6.84E-001
RA-224	1.05E+000	2.43E-001	1.04E-001
PB-212	8.60E-001	1.26E-001	4.44E-002
BI-212	8.52E-001	3.12E-001	4.03E-001
TL-208	7.83E-001	1.35E-001	9.31E-002
U-235	Not Detected	---	2.43E-001
TH-231	Not Detected	---	1.02E+001
PA-231	Not Detected	---	1.47E+000
TH-227	Not Detected	---	4.07E-001
RA-223	Not Detected	---	1.84E-001
RN-219	Not Detected	---	4.34E-001
PB-211	Not Detected	---	9.82E-001
TL-207	Not Detected	---	1.56E+001
AM-241	Not Detected	---	2.56E-001
PU-239	Not Detected	---	4.06E+002
NP-237	Not Detected	---	2.19E+000
PA-233	Not Detected	---	6.12E-002
TH-229	Not Detected	---	2.21E-001

[Summary Report] - Sample ID: : 40018506

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	6.03E-002
AG-110m	Not Detected	---------	3.54E-002
BA-133	Not Detected	---------	6.69E-002
BE-7	Not Detected	---------	2.75E-001
CD-115	Not Detected	---------	1.47E-001
CE-139	Not Detected	---------	2.94E-002
CE-141	Not Detected	---------	5.41E-002
CE-144	Not Detected	---------	2.20E-001
CM-243	Not Detected	---------	1.84E-001
CO-56	Not Detected	---------	4.13E-002
CO-57	Not Detected	---------	2.85E-002
CO-58	Not Detected	---------	3.62E-002
CO-60	Not Detected	---------	4.38E-002
CR-51	Not Detected	---------	2.68E-001
CS-134	Not Detected	---------	6.42E-002
CS-137	Not Detected	---------	3.81E-002
EU-152	Not Detected	---------	8.50E-002
EU-154	Not Detected	---------	2.14E-001
EU-155	Not Detected	---------	1.27E-001
FE-59	Not Detected	---------	8.22E-002
GD-153	Not Detected	---------	9.01E-002
HG-203	Not Detected	---------	3.48E-002
I-131	Not Detected	---------	3.98E-002
IR-192	Not Detected	---------	3.03E-002
K-40	1.38E+001	1.93E+000	4.42E-001
MN-52	Not Detected	---------	4.87E-002
MN-54	Not Detected	---------	3.94E-002
MO-99	Not Detected	---------	4.92E-001
NA-22	Not Detected	---------	4.71E-002
NA-24	Not Detected	---------	4.40E-001
ND-147	Not Detected	---------	2.35E-001
NI-57	Not Detected	---------	1.55E-001
RH-101	Not Detected	---------	3.35E-002
RH-102m	Not Detected	---------	2.91E-002
RU-103	Not Detected	---------	3.23E-002
RU-106	Not Detected	---------	3.19E-001
SB-122	Not Detected	---------	7.22E-002
SB-124	Not Detected	---------	3.64E-002
SB-125	Not Detected	---------	9.36E-002
SN-113	Not Detected	---------	4.40E-002
SR-85	Not Detected	---------	4.04E-002
TA-182	Not Detected	---------	1.77E-001
TA-183	Not Detected	---------	2.95E-001
TL-201	Not Detected	---------	1.74E-001
Y-88	Not Detected	---------	3.34E-002
ZN-65	Not Detected	---------	1.21E-001
ZR-95	Not Detected	---------	6.67E-002

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
2/11/04 9:53:52 PM
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* Analyzed by: RT Preston 2/12/04 Reviewed by: [signature] 2-12-04 *

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Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064118-003
Lab Sample ID : 40018507
Sample Description : AOB8-GR-407-0.0-S
Sample Quantity : 716.800 gram
Sample Date/Time : 2/09/04 2:40:00 PM
Acquire Start Date/Time : 2/11/04 8:13:40 PM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.86E-001
RA-226	2.18E+000	6.14E-001	7.93E-001
PB-214	7.83E-001	1.19E-001	7.09E-002
BI-214	7.14E-001	1.18E-001	6.33E-002
PB-210	Not Detected	---------	2.20E+001
TH-232	8.73E-001	4.08E-001	1.91E-001
RA-228	7.68E-001	1.60E-001	1.69E-001
AC-228	8.26E-001	1.68E-001	1.28E-001
TH-228	Not Detected	---------	7.49E-001
RA-224	9.80E-001	2.27E-001	8.40E-002
PB-212	8.58E-001	1.26E-001	4.23E-002
BI-212	8.79E-001	3.39E-001	4.52E-001
TL-208	7.09E-001	1.23E-001	8.30E-002
U-235	Not Detected	---------	2.32E-001
TH-231	Not Detected	---------	9.60E+000
PA-231	Not Detected	---------	1.49E+000
TH-227	Not Detected	---------	4.01E-001
RA-223	Not Detected	---------	1.76E-001
RN-219	Not Detected	---------	4.31E-001
PB-211	Not Detected	---------	9.45E-001
TL-207	Not Detected	---------	1.53E+001
AM-241	Not Detected	---------	2.49E-001
PU-239	Not Detected	---------	3.91E+002
NP-237	Not Detected	---------	2.13E+000
PA-233	Not Detected	---------	6.07E-002
TH-229	Not Detected	---------	2.24E-001

[Summary Report] - Sample ID: : 40018507

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.90E-002
AG-110m	Not Detected	---------	3.41E-002
BA-133	Not Detected	---------	6.48E-002
BE-7	Not Detected	---------	2.70E-001
CD-115	Not Detected	---------	1.45E-001
CE-139	Not Detected	---------	2.94E-002
CE-141	Not Detected	---------	5.31E-002
CE-144	Not Detected	---------	2.14E-001
CM-243	Not Detected	---------	1.81E-001
CO-56	Not Detected	---------	4.18E-002
CO-57	Not Detected	---------	2.68E-002
CO-58	Not Detected	---------	3.64E-002
CO-60	Not Detected	---------	4.27E-002
CR-51	Not Detected	---------	2.65E-001
CS-134	Not Detected	---------	6.27E-002
CS-137	Not Detected	---------	3.72E-002
EU-152	Not Detected	---------	8.05E-002
EU-154	Not Detected	---------	2.13E-001
EU-155	Not Detected	---------	1.26E-001
FE-59	Not Detected	---------	8.21E-002
GD-153	Not Detected	---------	9.00E-002
HG-203	Not Detected	---------	3.39E-002
I-131	Not Detected	---------	3.68E-002
IR-192	Not Detected	---------	2.92E-002
K-40	1.29E+001	1.82E+000	4.48E-001
MN-52	Not Detected	---------	5.03E-002
MN-54	Not Detected	---------	4.06E-002
MO-99	Not Detected	---------	4.47E-001
NA-22	Not Detected	---------	5.18E-002
NA-24	Not Detected	---------	4.79E-001
ND-147	Not Detected	---------	2.47E-001
NI-57	Not Detected	---------	1.66E-001
RH-101	Not Detected	---------	3.44E-002
RH-102m	Not Detected	---------	2.91E-002
RU-103	Not Detected	---------	3.25E-002
RU-106	Not Detected	---------	3.25E-001
SB-122	Not Detected	---------	7.36E-002
SB-124	Not Detected	---------	3.52E-002
SB-125	Not Detected	---------	8.91E-002
SN-113	Not Detected	---------	4.21E-002
SR-85	Not Detected	---------	4.10E-002
TA-182	Not Detected	---------	1.71E-001
TA-183	Not Detected	---------	2.90E-001
TL-201	Not Detected	---------	1.69E-001
Y-88	Not Detected	---------	3.24E-002
ZN-65	Not Detected	---------	1.14E-001
ZR-95	Not Detected	---------	6.47E-002

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Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
2/11/04 11:35:37 PM
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* Analyzed by: RT Preston 2/11/04 Reviewed by: [illegible] 2-12-04 *

Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064119-003
Lab Sample ID : 40018508
Sample Description : AOB8-GR-408-0.0-S
Sample Quantity : 713.400 gram
Sample Date/Time : 2/09/04 2:43:00 PM
Acquire Start Date/Time : 2/11/04 9:55:25 PM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.01E-001
RA-226	2.21E+000	7.53E-001	1.05E+000
PB-214	7.76E-001	1.15E-001	5.87E-002
BI-214	6.98E-001	1.18E-001	7.40E-002
PB-210	Not Detected	---	2.29E+001
TH-232	7.92E-001	3.83E-001	2.35E-001
RA-228	7.04E-001	1.91E-001	2.18E-001
AC-228	8.21E-001	1.70E-001	1.34E-001
TH-228	8.22E-001	4.49E-001	6.69E-001
RA-224	9.14E-001	2.16E-001	8.93E-002
PB-212	8.12E-001	1.20E-001	4.32E-002
BI-212	6.93E-001	3.91E-001	5.83E-001
TL-208	7.55E-001	1.31E-001	9.14E-002
U-235	Not Detected	---	2.33E-001
TH-231	Not Detected	---	9.65E+000
PA-231	Not Detected	---	1.44E+000
TH-227	Not Detected	---	4.00E-001
RA-223	Not Detected	---	1.80E-001
RN-219	Not Detected	---	4.10E-001
PB-211	Not Detected	---	9.40E-001
TL-207	Not Detected	---	1.48E+001
AM-241	Not Detected	---	2.51E-001
PU-239	Not Detected	---	3.93E+002
NP-237	Not Detected	---	2.14E+000
PA-233	Not Detected	---	6.21E-002
TH-229	Not Detected	---	2.23E-001

[Summary Report] - Sample ID: : 40018508

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.71E-002
AG-110m	Not Detected	---------	3.34E-002
BA-133	Not Detected	---------	6.32E-002
BE-7	Not Detected	---------	2.73E-001
CD-115	Not Detected	---------	1.49E-001
CE-139	Not Detected	---------	2.93E-002
CE-141	Not Detected	---------	5.38E-002
CE-144	Not Detected	---------	2.12E-001
CM-243	Not Detected	---------	1.84E-001
CO-56	Not Detected	---------	4.05E-002
CO-57	Not Detected	---------	2.74E-002
CO-58	Not Detected	---------	3.81E-002
CO-60	Not Detected	---------	3.96E-002
CR-51	Not Detected	---------	2.73E-001
CS-134	Not Detected	---------	6.21E-002
CS-137	Not Detected	---------	3.62E-002
EU-152	Not Detected	---------	8.23E-002
EU-154	Not Detected	---------	1.99E-001
EU-155	Not Detected	---------	1.24E-001
FE-59	Not Detected	---------	8.10E-002
GD-153	Not Detected	---------	9.16E-002
HG-203	Not Detected	---------	3.37E-002
I-131	Not Detected	---------	3.85E-002
IR-192	Not Detected	---------	3.13E-002
K-40	1.42E+001	1.98E+000	4.11E-001
MN-52	Not Detected	---------	4.54E-002
MN-54	Not Detected	---------	3.99E-002
MO-99	Not Detected	---------	4.93E-001
NA-22	Not Detected	---------	4.64E-002
NA-24	Not Detected	---------	5.05E-001
ND-147	Not Detected	---------	2.40E-001
NI-57	Not Detected	---------	1.66E-001
RH-101	Not Detected	---------	3.43E-002
RH-102m	Not Detected	---------	2.89E-002
RU-103	Not Detected	---------	3.19E-002
RU-106	Not Detected	---------	3.08E-001
SB-122	Not Detected	---------	7.88E-002
SB-124	Not Detected	---------	3.64E-002
SB-125	Not Detected	---------	8.89E-002
SN-113	Not Detected	---------	4.05E-002
SR-85	Not Detected	---------	4.13E-002
TA-182	Not Detected	---------	1.74E-001
TA-183	Not Detected	---------	2.91E-001
TL-201	Not Detected	---------	1.76E-001
Y-88	Not Detected	---------	3.59E-002
ZN-65	Not Detected	---------	1.16E-001
ZR-95	Not Detected	---------	6.43E-002

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

2/12/04 1:17:25 AM

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* Analyzed by: RT Preston 2/12/04 Reviewed by: [signature] 2-12-04 *

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Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064120-003
Lab Sample ID : 40018509
Sample Description : AOB8-GR-409-0.0-S
Sample Quantity : 675.500 gram
Sample Date/Time : 2/09/04 2:46:00 PM
Acquire Start Date/Time : 2/11/04 11:37:10 PM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.97E-001
RA-226	2.13E+000	6.84E-001	9.34E-001
PB-214	7.82E-001	1.28E-001	1.01E-001
BI-214	7.19E-001	1.23E-001	7.92E-002
PB-210	Not Detected	---	2.28E+001
TH-232	8.11E-001	3.87E-001	2.15E-001
RA-228	7.75E-001	1.65E-001	1.81E-001
AC-228	7.79E-001	1.71E-001	1.52E-001
TH-228	7.93E-001	5.72E-001	8.86E-001
RA-224	1.01E+000	2.36E-001	9.30E-002
PB-212	8.58E-001	1.27E-001	4.57E-002
BI-212	9.25E-001	3.73E-001	5.09E-001
TL-208	7.58E-001	1.44E-001	1.29E-001
U-235	Not Detected	---	2.41E-001
TH-231	Not Detected	---	1.02E+001
PA-231	Not Detected	---	1.48E+000
TH-227	Not Detected	---	4.18E-001
RA-223	Not Detected	---	1.85E-001
RN-219	Not Detected	---	4.31E-001
PB-211	Not Detected	---	9.61E-001
TL-207	Not Detected	---	1.58E+001
AM-241	Not Detected	---	2.55E-001
PU-239	Not Detected	---	4.06E+002
NP-237	Not Detected	---	2.16E+000
PA-233	Not Detected	---	6.37E-002
TH-229	Not Detected	---	2.26E-001

[Summary Report] - Sample ID: : 40018509

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.99E-002
AG-110m	Not Detected	---------	3.53E-002
BA-133	Not Detected	---------	6.26E-002
BE-7	Not Detected	---------	2.89E-001
CD-115	Not Detected	---------	1.58E-001
CE-139	Not Detected	---------	3.02E-002
CE-141	Not Detected	---------	5.45E-002
CE-144	Not Detected	---------	2.21E-001
CM-243	Not Detected	---------	1.88E-001
CO-56	Not Detected	---------	4.17E-002
CO-57	Not Detected	---------	2.79E-002
CO-58	Not Detected	---------	3.65E-002
CO-60	Not Detected	---------	4.77E-002
CR-51	Not Detected	---------	2.80E-001
CS-134	Not Detected	---------	6.49E-002
CS-137	Not Detected	---------	3.92E-002
EU-152	Not Detected	---------	8.31E-002
EU-154	Not Detected	---------	2.15E-001
EU-155	Not Detected	---------	1.32E-001
FE-59	Not Detected	---------	8.56E-002
GD-153	Not Detected	---------	9.03E-002
HG-203	Not Detected	---------	3.36E-002
I-131	Not Detected	---------	3.95E-002
IR-192	Not Detected	---------	3.16E-002
K-40	1.43E+001	2.01E+000	4.55E-001
MN-52	Not Detected	---------	4.95E-002
MN-54	Not Detected	---------	4.05E-002
MO-99	Not Detected	---------	5.04E-001
NA-22	Not Detected	---------	4.61E-002
NA-24	Not Detected	---------	5.68E-001
ND-147	Not Detected	---------	2.48E-001
NI-57	Not Detected	---------	1.91E-001
RH-101	Not Detected	---------	3.42E-002
RH-102m	Not Detected	---------	3.00E-002
RU-103	Not Detected	---------	3.45E-002
RU-106	Not Detected	---------	3.54E-001
SB-122	Not Detected	---------	8.66E-002
SB-124	Not Detected	---------	3.80E-002
SB-125	Not Detected	---------	9.16E-002
SN-113	Not Detected	---------	4.24E-002
SR-85	Not Detected	---------	4.21E-002
TA-182	Not Detected	---------	1.90E-001
TA-183	Not Detected	---------	2.98E-001
TL-201	Not Detected	---------	1.80E-001
Y-88	Not Detected	---------	3.94E-002
ZN-65	Not Detected	---------	1.32E-001
ZR-95	Not Detected	---------	6.60E-002

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* 2/12/04 2:59:11 AM *
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* Analyzed by: RT Preston 2/12/04 Reviewed by: Jim Pike 2-12-04 *

Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064121-003
Lab Sample ID : 40018510
Sample Description : AOB8-GR-410-0.0-S
Sample Quantity : 735.600 gram
Sample Date/Time : 2/09/04 2:46:00 PM
Acquire Start Date/Time : 2/12/04 1:18:59 AM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	6.90E-001
RA-226	2.36E+000	7.08E-001	9.50E-001
PB-214	8.32E-001	1.31E-001	9.40E-002
BI-214	7.60E-001	1.24E-001	6.37E-002
PB-210	Not Detected	---	2.24E+001
TH-232	8.01E-001	3.92E-001	2.57E-001
RA-228	9.35E-001	1.79E-001	1.56E-001
AC-228	8.11E-001	1.62E-001	1.14E-001
TH-228	1.25E+000	5.26E-001	7.50E-001
RA-224	1.07E+000	2.44E-001	9.29E-002
PB-212	8.47E-001	1.24E-001	4.33E-002
BI-212	9.57E-001	3.46E-001	4.54E-001
TL-208	7.94E-001	1.37E-001	9.55E-002
U-235	Not Detected	---	2.42E-001
TH-231	Not Detected	---	9.63E+000
PA-231	Not Detected	---	1.51E+000
TH-227	Not Detected	---	4.01E-001
RA-223	Not Detected	---	1.76E-001
RN-219	Not Detected	---	4.08E-001
PB-211	Not Detected	---	9.37E-001
TL-207	Not Detected	---	1.52E+001
AM-241	Not Detected	---	2.48E-001
PU-239	Not Detected	---	3.98E+002
NP-237	Not Detected	---	2.17E+000
PA-233	Not Detected	---	5.95E-002
TH-229	Not Detected	---	2.15E-001

[Summary Report] - Sample ID: : 40018510

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	5.85E-002
AG-110m	Not Detected	---------	3.81E-002
BA-133	Not Detected	---------	6.34E-002
BE-7	Not Detected	---------	2.68E-001
CD-115	Not Detected	---------	1.54E-001
CE-139	Not Detected	---------	2.88E-002
CE-141	Not Detected	---------	5.37E-002
CE-144	Not Detected	---------	2.22E-001
CM-243	Not Detected	---------	1.88E-001
CO-56	Not Detected	---------	3.86E-002
CO-57	Not Detected	---------	2.76E-002
CO-58	Not Detected	---------	3.49E-002
CO-60	Not Detected	---------	4.17E-002
CR-51	Not Detected	---------	2.78E-001
CS-134	Not Detected	---------	6.28E-002
CS-137	Not Detected	---------	3.96E-002
EU-152	Not Detected	---------	8.23E-002
EU-154	Not Detected	---------	2.17E-001
EU-155	Not Detected	---------	1.27E-001
FE-59	Not Detected	---------	7.97E-002
GD-153	Not Detected	---------	8.92E-002
HG-203	Not Detected	---------	3.42E-002
I-131	Not Detected	---------	3.80E-002
IR-192	Not Detected	---------	3.09E-002
K-40	1.51E+001	2.09E+000	4.20E-001
MN-52	Not Detected	---------	4.88E-002
MN-54	Not Detected	---------	2.27E-002
MO-99	Not Detected	---------	4.95E-001
NA-22	Not Detected	---------	4.64E-002
NA-24	Not Detected	---------	6.00E-001
ND-147	Not Detected	---------	2.51E-001
NI-57	Not Detected	---------	1.82E-001
RH-101	Not Detected	---------	3.39E-002
RH-102m	Not Detected	---------	2.82E-002
RU-103	Not Detected	---------	3.18E-002
RU-106	Not Detected	---------	3.43E-001
SB-122	Not Detected	---------	8.00E-002
SB-124	Not Detected	---------	3.58E-002
SB-125	Not Detected	---------	9.48E-002
SN-113	Not Detected	---------	4.21E-002
SR-85	Not Detected	---------	4.05E-002
TA-182	Not Detected	---------	1.78E-001
TA-183	Not Detected	---------	2.98E-001
TL-201	Not Detected	---------	1.80E-001
Y-88	Not Detected	---------	3.35E-002
ZN-65	Not Detected	---------	1.19E-001
ZR-95	Not Detected	---------	6.54E-002

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

2/12/04 4:40:56 AM

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Analyzed by: RT Preston 2/12/04 Reviewed by: [signature] 2-12-04

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Customer : FRESHOUR, P. (6133)
Customer Sample ID : 064121-005
Lab Sample ID : 40018511
Sample Description : AOB8-GR-411-0.0-DU
Sample Quantity : 682.900 gram
Sample Date/Time : 2/09/04 2:49:00 PM
Acquire Start Date/Time : 2/12/04 3:00:44 AM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
U-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.28E-001
RA-226	1.75E+000	6.65E-001	9.51E-001
PB-214	8.02E-001	1.27E-001	9.20E-002
BI-214	7.25E-001	1.26E-001	8.89E-002
PB-210	Not Detected	---	2.36E+001
TH-232	9.05E-001	4.36E-001	2.64E-001
RA-228	7.67E-001	1.62E-001	1.67E-001
AC-228	8.80E-001	1.76E-001	1.24E-001
TH-228	5.51E-001	5.00E-001	7.90E-001
RA-224	1.16E+000	2.64E-001	1.02E-001
PB-212	8.92E-001	1.31E-001	4.54E-002
BI-212	1.04E+000	3.84E-001	5.09E-001
TL-208	7.61E-001	1.41E-001	1.19E-001
U-235	Not Detected	---	2.42E-001
TH-231	Not Detected	---	9.97E+000
PA-231	Not Detected	---	1.56E+000
TH-227	Not Detected	---	4.28E-001
RA-223	Not Detected	---	1.83E-001
RN-219	Not Detected	---	4.39E-001
PB-211	Not Detected	---	9.85E-001
TL-207	Not Detected	---	1.58E+001
AM-241	Not Detected	---	2.59E-001
PU-239	Not Detected	---	4.11E+002
NP-237	Not Detected	---	2.24E+000
PA-233	Not Detected	---	6.51E-002
TH-229	Not Detected	---	2.33E-001

[Summary Report] - Sample ID: : 40018511

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	5.72E-002
AG-110m	Not Detected	---	3.88E-002
BA-133	Not Detected	---	6.37E-002
BE-7	Not Detected	---	2.93E-001
CD-115	Not Detected	---	1.65E-001
CE-139	Not Detected	---	3.10E-002
CE-141	Not Detected	---	5.57E-002
CE-144	Not Detected	---	2.24E-001
CM-243	Not Detected	---	1.84E-001
CO-56	Not Detected	---	4.25E-002
CO-57	Not Detected	---	2.77E-002
CO-58	Not Detected	---	3.50E-002
CO-60	Not Detected	---	3.99E-002
CR-51	Not Detected	---	2.83E-001
CS-134	Not Detected	---	6.63E-002
CS-137	Not Detected	---	4.19E-002
EU-152	Not Detected	---	8.31E-002
EU-154	Not Detected	---	2.20E-001
EU-155	Not Detected	---	1.30E-001
FE-59	Not Detected	---	8.58E-002
GD-153	Not Detected	---	9.48E-002
HG-203	Not Detected	---	3.45E-002
I-131	Not Detected	---	4.14E-002
IR-192	Not Detected	---	3.24E-002
K-40	1.45E+001	2.02E+000	3.84E-001
MN-52	Not Detected	---	4.74E-002
MN-54	Not Detected	---	3.97E-002
MO-99	Not Detected	---	5.06E-001
NA-22	Not Detected	---	5.26E-002
NA-24	Not Detected	---	6.37E-001
ND-147	Not Detected	---	2.62E-001
NI-57	Not Detected	---	1.88E-001
RH-101	Not Detected	---	3.56E-002
RH-102m	Not Detected	---	3.12E-002
RU-103	Not Detected	---	3.58E-002
RU-106	Not Detected	---	3.45E-001
SB-122	Not Detected	---	8.13E-002
SB-124	Not Detected	---	3.96E-002
SB-125	Not Detected	---	9.62E-002
SN-113	Not Detected	---	4.35E-002
SR-85	Not Detected	---	4.21E-002
TA-182	Not Detected	---	1.81E-001
TA-183	Not Detected	---	3.15E-001
TL-201	Not Detected	---	1.90E-001
Y-88	Not Detected	---	3.57E-002
ZN-65	Not Detected	---	1.27E-001
ZR-95	Not Detected	---	6.44E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* 2/12/04 7:51:56 AM *
****

* Analyzed by: RT Preston 2/12/04 Reviewed by: [signature] 2-12-04 *

Customer : FRESHOUR, P. (6133)
Customer Sample ID : LAB CONTROL SAMPLE USING DA-610
Lab Sample ID : 40018513
Sample Description : MIXED_GAMMA_STANDARD_DA-610
Sample Quantity : 1.000 Each
Sample Date/Time : 8/01/92 12:00:00 PM
Acquire Start Date/Time : 2/12/04 7:41:42 AM
Detector Name : LAB08
Procedure Number : RPSD-09-01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	4.41E+003
RA-226	Not Detected	---	7.50E+003
PB-214	Not Detected	---	8.43E+002
BI-214	Not Detected	---	6.97E+002
PB-210	Not Detected	---	3.09E+005
TH-232	Not Detected	---	2.60E+003
RA-228	Not Detected	---	2.85E+003
AC-228	Not Detected	---	1.63E+003
TH-228	Not Detected	---	4.90E+005
RA-224	Not Detected	---	1.93E+004
PB-212	Not Detected	---	3.93E+004
BI-212	Not Detected	---	2.87E+005
TL-208	Not Detected	---	7.23E+004
U-235	Not Detected	---	1.94E+003
TH-231	Not Detected	---	7.17E+004
PA-231	Not Detected	---	1.70E+004
TH-227	Not Detected	---	3.37E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	7.93E+003
PB-211	Not Detected	---	1.78E+004
TL-207	Not Detected	---	2.53E+005
AM-241	7.50E+004	1.08E+004	2.18E+003
PU-239	Not Detected	---	3.24E+006
NP-237	Not Detected	---	1.70E+004
PA-233	Not Detected	---	7.19E+002
TH-229	Not Detected	---	1.79E+003

[Summary Report] - Sample ID: : 40018513

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.81E+002
AG-110m	Not Detected	---	2.40E+008
BA-133	Not Detected	---	1.11E+003
BE-7	Not Detected	---	1.00E+026
CD-115	Not Detected	---	1.00E+026
CE-139	Not Detected	---	4.13E+011
CE-141	Not Detected	---	1.00E+026
CE-144	Not Detected	---	5.17E+007
CM-243	Not Detected	---	2.43E+003
CO-56	Not Detected	---	1.09E+019
CO-57	Not Detected	---	1.08E+007
CO-58	Not Detected	---	2.66E+020
CO-60	9.67E+004	1.26E+004	9.26E+002
CR-51	Not Detected	---	1.00E+026
CS-134	Not Detected	---	1.57E+004
CS-137	8.16E+004	1.03E+004	7.30E+002
EU-152	Not Detected	---	1.27E+003
EU-154	Not Detected	---	3.68E+003
EU-155	Not Detected	---	5.50E+003
FE-59	Not Detected	---	1.00E+026
GD-153	Not Detected	---	1.27E+008
HG-203	Not Detected	---	1.00E+026
I-131	Not Detected	---	1.00E+026
IR-192	Not Detected	---	5.12E+019
K-40	Not Detected	---	1.49E+003
MN-52	Not Detected	---	1.00E+026
MN-54	Not Detected	---	4.32E+006
MO-99	Not Detected	---	1.00E+026
NA-22	Not Detected	---	4.72E+003
NA-24	Not Detected	---	1.00E+026
ND-147	Not Detected	---	1.00E+026
NI-57	Not Detected	---	1.00E+026
RH-101	Not Detected	---	3.94E+003
RH-102m	Not Detected	---	6.01E+008
RU-103	Not Detected	---	1.00E+026
RU-106	Not Detected	---	9.31E+006
SB-122	Not Detected	---	1.00E+026
SB-124	Not Detected	---	1.00E+026
SB-125	Not Detected	---	2.41E+004
SN-113	Not Detected	---	5.46E+013
SR-85	Not Detected	---	1.61E+022
TA-182	Not Detected	---	1.29E+014
TA-183	Not Detected	---	1.00E+026
TL-201	Not Detected	---	1.00E+026
Y-88	Not Detected	---	1.52E+014
ZN-65	Not Detected	---	1.43E+008
ZR-95	Not Detected	---	3.80E+022

****
*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 2/12/04 7:52:00 AM
QA File : C:\GENIE2K\CAMFILES\LCS8.QAF
Analyst : RTPREST
Sample ID : 40018513
Sample Quantity : 1.00 Each
Sample Date : 8/01/92 12:00:00 PM
Measurement Date : 2/12/04 7:41:42 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.293E-002	3.000E-003	7.505E-002	<	Ac:		
CS-137 Activity	8.237E-002	1.683E-003	8.163E-002	<			>
CO-60 Activity	9.586E-002	2.041E-003	9.502E-002	<			>

Am-241: multiplet peaks

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: RTPreston 2/12/04

Feature 8Y

Internal Lab Batch No. 900182

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

AR/COC 601334

SAR/WR No.

Dept. No./Mail Stop:	6134/1148	Date Samples Shipped to SMO: [redacted] 1/25/55	Contract No.: ~~AJ-2400A~~ QR
Project/Task Manager:	Site 8/58 Caroline Byrd	Carrier/Waybill No.: [redacted]	Case No.: 7213.220600
Project Name:	Foothill Test Area	Lab Contact: ~~Edie Kent~~ Fernando	SMO Authorization:
Record Center Code:	ER/1333/58/DAT	Lab Destination: ~~GEL~~ Amir	Bill To: Sandia National Laboratories
Logbook Ref. No.:		SMO Contact/Phone: Doug Salmi/848-0963	Supplier Services Dept.:
Service Order No.	CF0655	Send Report to SMO	P O Box 5800 MS 0154
Location	NA		

COPY

Reference LOV(available at SMO)

Sample No -Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft	ER Site No	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Lab Sample ID
044117-004	S8Y-GR-101-0-SS	0	58	12599/915	S	M	500m	none	G	SA	Gamma Spec	[redacted]
044118-004	S8Y-GR-102-0-SS	0	58	12599/930	S	M	500m	none	G	SA	Gamma Spec	

RMMA ☒ Yes ☐ No Ref. No. [redacted]

Sample Disposal ☐ Return to Client ☒ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush

Required Report Date 2/3/99 WT

Special Instructions/QC Requirements

EDD ☐ Yes ☒ No

Raw Data Package ☐ Yes ☒ No

This COC releases 601332

Please list as separate report.

	Name	Signature	Init	Company/Organization/Phone
Sample Team Members	Chris Catechis	C. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	William J. Gibson	WJG	MDM/6131/235-3841

1. Relinquished by	William J. Gibson	Org. 6131	Date 1-26-99	Time 1623	4 Relinquished by	[redacted] (SMO)	Org. 7578	Date 2/1/99	Time 0919
1. Received by	[redacted] (Bino)	Org. 7578	Date 1-26-99	Time 1623	4. Received by	[redacted]	Org. 6133	Date 2/1/99	Time 0919
2. Relinquished by	[redacted] SMO	Org. 7577	Date 1-26-99	Time 1630	5 Relinquished by		Org.	Date	Time
2. Received by	[redacted]	Org. SMO 7578	Date 1-26-99	Time 1630	5 Received by		Org.	Date	Time
3 Relinquished by	[redacted]	Org. SMO 7578	Date 1-27-99	Time 1008	6 Relinquished by		Org.	Date	Time
3. Received by	[redacted] (SMO)	Org. 7578	Date 1-27-99	Time 1008	6 Received by		Org.	Date	Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134 / 1148
Project Location: Site 58
Phone: 845-0868
Date Results Needed: Rush
Suspect Isotopes: UNK
Other Information: N/A

Hazards/Special Instructions:

RUSH

Case # 7213.2206
COC #601334

Batch Log Number: 900182
Logged By: JM

Analysis Type:
- [X] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044117-004	Soil	12599/915	500ml	Gamma Spec	01	<300	968	
044118-004	Soil	12599/930	500ml	Gamma Spec	02	<300	901	
LCS	—	1/NOV/20	—	γ Spec	03	N/A	N/A	

Relinquished by SMO Date 1/26/99 Time 1630 Received by Date 1/26/99 Time 1630
Relinquished by Date 1/27/99 Time 1008 Received by Date 1/27/99 Time 1008
Relinquished by Date Time Received by Date Time
Relinquished by Date Time Received by Date Time

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/27/99 8:14:26 AM

Analyzed by: 1/27/99 Reviewed by: 1/27/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044117-004
Lab Sample ID : 90018201

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 968.000 gram
Sample Date/Time : 1/25/99 9:15:00 AM
Acquire Start Date/Time : 1/26/99 6:16:37 PM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.40E-001
RA-226	1.03E+000	6.43E-001	4.62E-001
PB-214	4.01E-001	9.35E-002	3.65E-002
BI-214	3.23E-001	2.50E-001	4.06E-002
PB-210	Not Detected	---	3.37E+000
TH-232	5.77E-001	3.21E-001	1.34E-001
RA-228	5.81E-001	2.68E-001	1.47E-001
AC-228	5.55E-001	3.05E-001	9.12E-002
TH-228	6.20E-001	1.34E-001	3.76E-001
RA-224	Not Detected	---	2.17E-001
PB-212	5.43E-001	1.03E-001	3.14E-002
BI-212	6.24E-001	3.96E-001	2.98E-001
TL-208	5.22E-001	3.95E-001	5.70E-002
U-235	Not Detected	---	1.61E-001
TH-231	Not Detected	---	8.34E-001
PA-231	Not Detected	---	1.14E+000
TH-227	Not Detected	---	2.78E-001
RA-223	Not Detected	---	1.02E-001
RN-219	Not Detected	---	3.23E-001
PB-211	Not Detected	---	7.34E-001
TL-207	Not Detected	---	1.36E+001
AM-241	Not Detected	---	1.19E-001
PU-239	Not Detected	---	2.73E+002
NP-237	~~3.60E-001~~	~~2.21E-001~~	1.49E-001 Not detected 1/27/99
PA-233	Not Detected	---	4.95E-002
TH-229	Not Detected	---	1.47E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90018201

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.61E-002
AG-110m	Not Detected	---	3.30E-002
BA-133	Not Detected	---	4.36E-002
BE-7	Not Detected	---	2.04E-001
CD-109	Not Detected	---	5.06E-001
CD-115	Not Detected	---	8.12E-002
CE-139	Not Detected	---	2.14E-002
CE-141	Not Detected	---	3.64E-002
CE-144	Not Detected	---	1.50E-001
CO-56	Not Detected	---	2.94E-002
CO-57	Not Detected	---	1.90E-002
CO-58	Not Detected	---	3.01E-002
CO-60	Not Detected	---	3.67E-002
CR-51	Not Detected	---	2.03E-001
CS-134	Not Detected	---	3.93E-002
CS-137	4.55E-002	3.06E-002	2.14E-002
EU-152	Not Detected	---	5.69E-002
EU-154	Not Detected	---	1.68E-001
EU-155	Not Detected	---	8.46E-002
FE-59	Not Detected	---	7.75E-002
GD-153	Not Detected	---	6.04E-002
HG-203	Not Detected	---	2.59E-002
I-131	Not Detected	---	2.60E-002
IR-192	Not Detected	---	2.32E-002
K-40	2.15E+001	3.17E+000	3.82E-001
MN-52	Not Detected	---	3.24E-002
MN-54	Not Detected	---	1.93E-002
MO-99	Not Detected	---	3.11E-001
NA-22	Not Detected	---	4.25E-002
NA-24	Not Detected	---	1.55E-001
NB-95	Not Detected	---	1.62E-001
ND-147	Not Detected	---	1.92E-001
NI-57	Not Detected	---	8.41E-002
RU-103	Not Detected	---	2.38E-002
RU-106	Not Detected	---	2.40E-001
SB-122	Not Detected	---	4.96E-002
SB-124	Not Detected	---	2.64E-002
SB-125	Not Detected	---	7.01E-002
SN-113	Not Detected	---	3.13E-002
SR-85	Not Detected	---	2.99E-002
TA-182	Not Detected	---	1.42E-001
TA-183	Not Detected	---	1.23E-001
TC-99m	Not Detected	---	9.27E-001
TL-201	Not Detected	---	8.96E-002
XE-133	Not Detected	---	1.00E-001
Y-88	Not Detected	---	1.85E-002
ZN-65	Not Detected	---	9.37E-002
ZR-95	Not Detected	---	5.28E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/27/99 7:54:48 AM

Analyzed by: 1/27/99 Reviewed by: 1/27/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : 044118-004
Lab Sample ID : 90018202

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 901.000 gram
Sample Date/Time : 1/25/99 9:30:00 AM
Acquire Start Date/Time : 1/27/99 5:39:44 AM
Detector Name : LAB03
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.79E-001
RA-226	1.07E+000	6.71E-001	5.38E-001
PB-214	4.40E-001	1.07E-001	4.13E-002
BI-214	4.11E-001	1.07E-001	4.32E-002
PB-210	Not Detected	---------	3.68E+000
TH-232	5.81E-001	2.68E-001	1.51E-001
RA-228	6.11E-001	3.15E-001	1.58E-001
AC-228	6.13E-001	2.03E-001	9.16E-002
TH-228	7.54E-001	2.41E-001	4.05E-001
RA-224	Not Detected	---------	2.46E-001
PB-212	6.08E-001	2.17E-001	3.49E-002
BI-212	9.51E-001	5.16E-001	3.17E-001
TL-208	5.43E-001	1.48E-001	6.16E-002
U-235	1.43E-001	1.44E-001	1.76E-001
TH-231	Not Detected	---------	9.15E-001
PA-231	Not Detected	---------	1.25E+000
TH-227	Not Detected	---------	3.06E-001
RA-223	Not Detected	---------	1.11E-001
RN-219	Not Detected	---------	3.71E-001
PB-211	Not Detected	---------	8.08E-001
TL-207	Not Detected	---------	1.46E+001
AM-241	Not Detected	---------	1.30E-001
PU-239	Not Detected	---------	2.97E+002
NP-237	~~3.99E-001~~	~~1.98E-001~~	1.39E-001 Not detected
PA-233	Not Detected	---------	5.22E-002
TH-229	Not Detected	---------	1.66E-001

1/27/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90018202

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.99E-002
AG-110m	Not Detected	---	5.17E-002
BA-133	Not Detected	---	4.92E-002
BE-7	Not Detected	---	2.29E-001
CD-109	Not Detected	---	4.71E-001
CD-115	Not Detected	---	1.04E-001
CE-139	Not Detected	---	2.32E-002
CE-141	Not Detected	---	3.87E-002
CE-144	Not Detected	---	1.57E-001
CO-56	Not Detected	---	3.33E-002
CO-57	Not Detected	---	2.06E-002
CO-58	Not Detected	---	2.98E-002
CO-60	Not Detected	---	3.88E-002
CR-51	Not Detected	---	2.22E-001
CS-134	Not Detected	---	4.47E-002
CS-137	2.35E-001	4.11E-002	2.49E-002
EU-152	Not Detected	---	6.18E-002
EU-154	Not Detected	---	1.85E-001
EU-155	Not Detected	---	9.34E-002
FE-59	Not Detected	---	7.75E-002
GD-153	Not Detected	---	6.71E-002
HG-203	Not Detected	---	2.76E-002
I-131	Not Detected	---	2.99E-002
IR-192	Not Detected	---	2.55E-002
K-40	2.15E+001	3.21E+000	4.13E-001
MN-52	Not Detected	---	3.51E-002
MN-54	Not Detected	---	3.43E-002
MO-99	Not Detected	---	3.59E-001
NA-22	Not Detected	---	4.55E-002
NA-24	Not Detected	---	2.54E-001
NB-95	Not Detected	---	1.96E-001
ND-147	Not Detected	---	2.21E-001
NI-57	Not Detected	---	1.06E-001
RU-103	Not Detected	---	2.69E-002
RU-106	Not Detected	---	2.89E-001
SB-122	Not Detected	---	6.05E-002
SB-124	Not Detected	---	2.90E-002
SB-125	Not Detected	---	7.77E-002
SN-113	Not Detected	---	3.51E-002
SR-85	Not Detected	---	3.23E-002
TA-182	Not Detected	---	1.53E-001
TA-183	Not Detected	---	1.42E-001
TC-99m	Not Detected	---	3.75E+000
TL-201	Not Detected	---	1.10E-001
XE-133	Not Detected	---	1.24E-001
Y-88	Not Detected	---	2.60E-002
ZN-65	Not Detected	---	1.02E-001
ZR-95	Not Detected	---	5.38E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/27/99 7:57:54 AM

Analyzed by: 1/27/99 Reviewed by: 1/27/99

Customer : C.BYRD/D.PERRY (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90018203

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/27/99 7:47:40 AM
Detector Name : LAB03
Elapsed Live/Real Time : 600 / 606 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	2.95E+003
RA-226	Not Detected	---------	5.87E+003
PB-214	Not Detected	---------	7.80E+002
BI-214	Not Detected	---------	7.16E+002
PB-210	Not Detected	---------	4.63E+004
TH-232	Not Detected	---------	2.36E+003
RA-228	Not Detected	---------	3.04E+003
AC-228	Not Detected	---------	1.82E+003
TH-228	Not Detected	---------	1.49E+005
RA-224	Not Detected	---------	6.70E+003
PB-212	Not Detected	---------	9.50E+003
BI-212	Not Detected	---------	9.46E+004
TL-208	Not Detected	---------	2.12E+004
U-235	Not Detected	---------	1.51E+003
TH-231	Not Detected	---------	7.13E+003
PA-231	Not Detected	---------	1.47E+004
TH-227	Not Detected	---------	2.47E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	6.85E+003
PB-211	Not Detected	---------	1.54E+004
TL-207	Not Detected	---------	2.67E+005
AM-241	8.86E+004	1.49E+004	1.18E+003
PU-239	Not Detected	---------	2.33E+006
NP-237	Not Detected	---------	1.36E+003
PA-233	Not Detected	---------	6.70E+002
TH-229	Not Detected	---------	1.21E+003

[Summary Report] - Sample ID: : 90018203

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.77E+002
AG-110m	Not Detected	---------	8.00E+006
BA-133	Not Detected	---------	8.27E+002
BE-7	Not Detected	---------	3.72E+020
CD-109	2.95E+005	2.13E+005	2.86E+005
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	8.06E+008
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	2.02E+006
CO-56	Not Detected	---------	2.42E+014
CO-57	Not Detected	---------	3.66E+005
CO-58	Not Detected	---------	2.16E+015
CO-60	7.98E+004	1.12E+004	6.01E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	5.39E+003
CS-137	7.06E+004	9.46E+003	3.52E+002
EU-152	Not Detected	---------	7.81E+002
EU-154	Not Detected	---------	3.22E+003
EU-155	Not Detected	---------	2.45E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	2.75E+006
HG-203	Not Detected	---------	8.30E+021
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	5.80E+014
K-40	Not Detected	---------	1.78E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	3.26E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	2.19E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	9.61E+005
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	3.74E+017
SB-125	Not Detected	---------	1.01E+004
SN-113	Not Detected	---------	3.80E+010
SR-85	Not Detected	---------	3.66E+016
TA-182	Not Detected	---------	1.05E+011
TA-183	Not Detected	---------	1.00E+026
TC-99m	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	5.52E+010
ZN-65	Not Detected	---------	5.15E+006
ZR-95	Not Detected	---------	8.88E+016

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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program

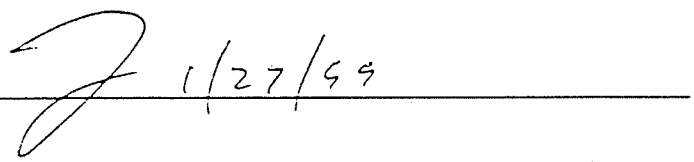
Quality Assurance Report

****

Report Date : 1/27/99 7:57:56 AM
QA File : C:\GENIE2K\CAMFILES\LCS3.QAF
Analyst : FCD
Sample ID : 90018203
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/27/99 7:47:40 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.693E-002	1.869E-003	8.855E-002	<	:	:	: >
CS-137 Activity	6.934E-002	1.984E-003	7.062E-002	<	:	:	: >
CO-60 Activity	7.940E-002	2.074E-003	8.048E-002	<	:	:	: >

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by:  1/27/99

"RUSH" "RUSH"

SF 2001-COC (10-97)
Supersedes (5-97) issue

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab Batch No. 801989 SAR/WR No.

AR/COC- 600855

Dept. No./Mail Stop: 6134 MS-1148
Project/Task Manager: Caroline Byrd Site 8 JCM
Project Name: (8/58 Waste Char. Sampling)
Record Center Code: ER/1303/8-58/DAT
Logbook Ref. No.: 021
Service Order No.: CF0614

Date Samples Shipped: 9/23/98 SMO USE
Carrier/Waybill No.: HC
Lab Contact:: Fernando Dominguez
Lab Destination: RPSD Bldg. 606 / 844-7683
SMO Contact/Phone: Doug Salmi / 844-3110
Send Report to SMO: Suzi Montano/844-3184

Contract No.: NA
Case No.: 7213.2201
SMO Authorization
Bill to: Sandia National Laboratories
Supplier Services, Dept.
P.O. Box 5800 MS 0154

RECEIVED SEP 23 [illegible]

LAB USE

Location Tech Area NA
Building NA Room NA

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO) Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
042919-001	58B-GR-100-0-SS	0	58B	9/22/98 1000	S	M	500 ML	None	GR	SA	Gamma Spec	
042923-001	58B-GR-104-0-SS			1040								
042928-001	58B-GR-109-0-SS			1052								
042933-001	58B-GR-114-0-SS			1100								
042938-001	58B-GR-119-0-SS			1120								

RMMA ☒Yes ☐No Ref. No.
Sample Disposal ☐Return to Client ☒Disposal by lab

Sample Tracking SMO USE
Date Entered (mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☐Yes ☒No
Raw data package ☐Yes ☒No
*Send Copy of report to Mike Young/ 284-2595.
*List as separate report.
*RUSH RUSH RUSH RUSH RUSH RUSH
Releases COC.# 600853, 600854, 600856

Abnormal Conditions on Receipt LAB USE

Turnaround Time ☐Normal ☒Rush Required Report Date
QC inits.

Sample Team Members	Name	Signature	Init	Company/Organization/Phon
	Karen DeWees		KD	MDM/6131/284-2507
	J. Boyd		JB	TT/6131/284-3807

1. Relinquished by		Org. 6131	Date 9-23-98	Time 1228	4. Relinquished by	Org.	Date	
1. Received by		Org. 7577	Date 9-23-98	Time 1228	4. Received by	Org.	Date	
2. Relinquished by		Org. 7577	Date 9-23-98	Time 1248	5. Relinquished by	Org.	Date	
2. Received by		Org. SNL7578	Date 9/23/98	Time 1248	5. Received by	Org.	Date	
3. Relinquished by		Org. SNL7578	Date 9/24/98	Time 1030	6. Relinquished by	Org.	Date	
3. Received by		Org. 7577	Date 9/24/98	Time 1030	6. Received by	Org.	Date	

Original To Accompany Samples, Laboratory Copy (White) **1st Copy** To Accompany Samples, Return to SMO (Blue) **2nd Copy** SMO Suspense Copy (Yellow) **3rd Copy** Field Copy (Pink)

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-23-98 3:02:44 PM *
****

* Analyzed by: 9/24/98 Reviewed by: 9/24/98 *

Customer : M.YOUNG/R.PARKER (6134/SMO)
Customer Sample ID : 042919-001
Lab Sample ID : 80198901

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 775.000 gram
Sample Date/Time : 9-22-98 10:00:00 AM
Acquire Start Date/Time : 9-23-98 1:19:21 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	4.99E-01	3.78E-01	6.03E-01
RA-226	1.88E+00	6.39E-01	6.11E-01
PB-214	7.77E-01	3.04E-01	4.60E-02
BI-214	7.16E-01	5.34E-01	4.03E-02
PB-210	Not Detected	---	3.51E+01
TH-232	9.44E-01	4.53E-01	1.36E-01
RA-228	1.07E+00	2.56E-01	1.46E-01
AC-228	Not Detected	---	2.39E-01
TH-228	9.30E-01	3.08E-01	4.57E-01
RA-224	1.03E+00	3.09E-01	6.77E-02
PB-212	1.02E+00	1.72E-01	3.92E-02
BI-212	1.04E+00	3.29E-01	3.15E-01
TL-208	9.00E-01	2.39E-01	6.62E-02
U-235	1.03E-01	2.05E-01	2.38E-01
TH-231	Not Detected	---	2.30E+00
PA-231	Not Detected	---	3.82E+00
TH-227	Not Detected	---	3.73E-01
RA-223	Not Detected	---	2.17E-01
RN-219	Not Detected	---	3.69E-01
PB-211	Not Detected	---	8.33E-01
TL-207	Not Detected	---	1.33E+01
AM-241	Not Detected	---	4.74E-01
PU-239	Not Detected	---	4.62E+02
NP-237	Not Detected	---	4.03E-01
PA-233	Not Detected	---	5.67E-02
TH-229	Not Detected	---	2.58E-01

[Summary Report] - Sample ID: : 80198901

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	4.32E-02
AG-110m	Not Detected	---	2.96E-02
BA-133	Not Detected	---	6.69E-02
BE-7	Not Detected	---	2.51E-01
CD-109	~~2.04E+00~~	~~9.94E-01~~	1.18E+00
CD-115	Not Detected	---	9.56E-02
CE-139	Not Detected	---	2.97E-02
CE-141	Not Detected	---	5.45E-02
CE-144	Not Detected	---	2.45E-01
CO-56	Not Detected	---	3.41E-02
CO-57	Not Detected	---	3.03E-02
CO-58	Not Detected	---	3.14E-02
CO-60	Not Detected	---	3.48E-02
CR-51	Not Detected	---	2.37E-01
CS-134	Not Detected	---	4.70E-02
CS-137	Not Detected	---	3.27E-02
EU-152	Not Detected	---	9.12E-02
EU-154	Not Detected	---	1.99E-01
EU-155	Not Detected	---	1.54E-01
FE-59	Not Detected	---	7.54E-02
GD-153	Not Detected	---	1.07E-01
HG-203	Not Detected	---	3.18E-02
I-131	Not Detected	---	3.03E-02
IR-192	Not Detected	---	2.69E-02
K-40	2.02E+01	2.92E+00	2.50E-01
KR-85	Not Detected	---	8.28E+00
MN-52	Not Detected	---	3.33E-02
MN-54	Not Detected	---	3.37E-02
MO-99	Not Detected	---	3.13E-01
NA-22	Not Detected	---	4.33E-02
NA-24	Not Detected	---	1.13E-01
NB-95	Not Detected	---	2.15E-01
ND-147	Not Detected	---	2.10E-01
NI-57	Not Detected	---	4.32E-02
NP-239	Not Detected	---	1.39E-01
RU-103	Not Detected	---	2.73E-02
RU-106	Not Detected	---	2.77E-01
SB-122	Not Detected	---	2.22E-02
SB-124	Not Detected	---	2.89E-02
SB-125	Not Detected	---	8.33E-02
SN-113	Not Detected	---	3.69E-02
TA-182	Not Detected	---	1.55E-01
TA-183	Not Detected	---	4.75E-01
TC-99m	Not Detected	---	7.50E-01
TL-201	Not Detected	---	2.40E-01
XE-133	Not Detected	---	2.11E-01
Y-88	Not Detected	---	2.55E-02
ZN-65	Not Detected	---	1.05E-01
ZR-95	Not Detected	---	5.57E-02

Not detected
9/24/98

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-23-98 4:47:55 PM *
****
*
* Analyzed by: 9/24/98 Reviewed by: AJM 9/24/98 *
****

Customer : M.YOUNG/R.PARKER (6134/SMO)
Customer Sample ID : 042923-001
Lab Sample ID : 80198902

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 755.000 gram
Sample Date/Time : 9-22-98 10:40:00 AM
Acquire Start Date/Time : 9-23-98 3:05:05 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6002 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	7.14E-01
RA-226	8.87E-01	4.92E-01	5.04E-01
PB-214	5.31E-01	2.94E-01	3.93E-02
BI-214	4.83E-01	5.57E-01	3.95E-02
PB-210	Not Detected	---	3.20E+01
TH-232	6.62E-01	3.47E-01	1.36E-01
RA-228	6.54E-01	1.95E-01	1.36E-01
AC-228	7.23E-01	2.21E-01	2.42E-01
TH-228	6.60E-01	2.46E-01	4.36E-01
RA-224	7.54E-01	2.21E-01	6.19E-02
PB-212	7.11E-01	2.03E-01	3.49E-02
BI-212	7.51E-01	4.01E-01	3.02E-01
TL-208	6.31E-01	4.61E-01	5.61E-02
U-235	Not Detected	---	2.14E-01
TH-231	Not Detected	---	2.16E+00
PA-231	Not Detected	---	3.53E+00
TH-227	Not Detected	---	3.25E-01
RA-223	Not Detected	---	1.95E-01
RN-219	Not Detected	---	3.31E-01
PB-211	Not Detected	---	7.50E-01
TL-207	Not Detected	---	1.27E+01
AM-241	Not Detected	---	4.40E-01
PU-239	Not Detected	---	4.15E+02
NP-237	Not Detected	---	3.13E-01
PA-233	Not Detected	---	5.30E-02
TH-229	Not Detected	---	2.30E-01

[Summary Report] - Sample ID: : 80198902

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.70E-02
AG-110m	Not Detected	---	2.83E-02
BA-133	Not Detected	---	5.78E-02
BE-7	Not Detected	---	2.33E-01
CD-109	Not Detected	---	1.06E+00
CD-115	Not Detected	---	8.80E-02
CE-139	Not Detected	---	2.69E-02
CE-141	Not Detected	---	4.87E-02
CE-144	Not Detected	---	2.24E-01
CO-56	Not Detected	---	3.17E-02
CO-57	Not Detected	---	2.79E-02
CO-58	Not Detected	---	2.84E-02
CO-60	Not Detected	---	3.71E-02
CR-51	Not Detected	---	2.19E-01
CS-134	Not Detected	---	4.23E-02
CS-137	Not Detected	---	3.12E-02
EU-152	Not Detected	---	8.38E-02
EU-154	Not Detected	---	1.71E-01
EU-155	Not Detected	---	1.36E-01
FE-59	Not Detected	---	6.66E-02
GD-153	Not Detected	---	9.72E-02
HG-203	Not Detected	---	2.94E-02
I-131	Not Detected	---	2.86E-02
IR-192	Not Detected	---	2.53E-02
K-40	1.96E+01	2.88E+00	2.23E-01
KR-85	Not Detected	---	7.68E+00
MN-52	Not Detected	---	3.16E-02
MN-54	Not Detected	---	3.21E-02
MO-99	Not Detected	---	2.94E-01
NA-22	Not Detected	---	4.40E-02
NA-24	Not Detected	---	1.10E-01
NB-95	Not Detected	---	1.89E-01
ND-147	Not Detected	---	1.97E-01
NI-57	Not Detected	---	4.07E-02
NP-239	Not Detected	---	1.22E-01
RU-103	Not Detected	---	2.72E-02
RU-106	Not Detected	---	2.73E-01
SB-122	Not Detected	---	5.01E-02
SB-124	Not Detected	---	2.82E-02
SB-125	Not Detected	---	7.23E-02
SN-113	Not Detected	---	3.42E-02
TA-182	Not Detected	---	1.37E-01
TA-183	Not Detected	---	4.46E-01
TC-99m	Not Detected	---	7.88E-01
TL-201	Not Detected	---	2.18E-01
XE-133	Not Detected	---	1.91E-01
Y-88	Not Detected	---	2.00E-02
ZN-65	Not Detected	---	9.33E-02
ZR-95	Not Detected	---	5.34E-02

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* Analyzed by: 9/24/98 Reviewed by: 9/24/98 *
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Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

9-23-98 6:32:51 PM

Customer : M.YOUNG/R.PARKER (6134/SMO)
Customer Sample ID : 042928-001
Lab Sample ID : 80198903

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 950.000 gram
Sample Date/Time : 9-22-98 10:52:00 AM
Acquire Start Date/Time : 9-23-98 4:50:03 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	7.95E-01	4.04E-01	5.23E-01
RA-226	8.58E-01	4.18E-01	4.47E-01
PB-214	5.03E-01	9.68E-02	3.48E-02
BI-214	4.91E-01	9.85E-02	3.37E-02
PB-210	Not Detected	---	2.90E+01
TH-232	Not Detected	---	1.17E-01
RA-228	Not Detected	---	1.25E-01
AC-228	6.79E-01	1.88E-01	1.98E-01
TH-228	6.11E-01	1.98E-01	4.00E-01
RA-224	7.35E-01	2.10E-01	5.48E-02
PB-212	6.97E-01	1.23E-01	3.26E-02
BI-212	6.78E-01	2.66E-01	2.63E-01
TL-208	6.73E-01	1.10E-01	5.84E-02
U-235	Not Detected	---	1.96E-01
TH-231	Not Detected	---	1.85E+00
PA-231	Not Detected	---	3.14E+00
TH-227	Not Detected	---	2.89E-01
RA-223	Not Detected	---	1.76E-01
RN-219	Not Detected	---	3.03E-01
PB-211	Not Detected	---	6.73E-01
TL-207	Not Detected	---	1.16E+01
AM-241	Not Detected	---	3.86E-01
PU-239	Not Detected	---	3.76E+02
NP-237	Not Detected	---	2.93E-01
PA-233	Not Detected	---	4.58E-02
TH-229	Not Detected	---	2.13E-01

[Summary Report] - Sample ID: : 80198903

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.26E-02
AG-110m	Not Detected	---	2.60E-02
BA-133	Not Detected	---	5.24E-02
BE-7	Not Detected	---	2.10E-01
CD-109	Not Detected	---	9.94E-01
CD-115	Not Detected	---	8.11E-02
CE-139	Not Detected	---	2.47E-02
CE-141	Not Detected	---	4.56E-02
CE-144	Not Detected	---	2.08E-01
CO-56	Not Detected	---	2.85E-02
CO-57	Not Detected	---	2.52E-02
CO-58	Not Detected	---	2.71E-02
CO-60	Not Detected	---	3.17E-02
CR-51	Not Detected	---	1.93E-01
CS-134	Not Detected	---	3.73E-02
CS-137	Not Detected	---	2.86E-02
EU-152	Not Detected	---	7.58E-02
EU-154	Not Detected	---	1.51E-01
EU-155	Not Detected	---	1.27E-01
FE-59	Not Detected	---	6.21E-02
GD-153	Not Detected	---	8.69E-02
HG-203	Not Detected	---	2.62E-02
I-131	Not Detected	---	2.60E-02
IR-192	Not Detected	---	2.21E-02
K-40	2.09E+01	2.98E+00	2.03E-01
KR-85	Not Detected	---	6.64E+00
MN-52	Not Detected	---	2.77E-02
MN-54	Not Detected	---	2.95E-02
MO-99	Not Detected	---	2.70E-01
NA-22	Not Detected	---	3.55E-02
NA-24	Not Detected	---	1.06E-01
NB-95	Not Detected	---	1.70E-01
ND-147	Not Detected	---	1.71E-01
NI-57	Not Detected	---	4.02E-02
NP-239	Not Detected	---	1.14E-01
RU-103	Not Detected	---	2.41E-02
RU-106	Not Detected	---	2.28E-01
SB-122	Not Detected	---	4.39E-02
SB-124	Not Detected	---	2.40E-02
SB-125	Not Detected	---	6.57E-02
SN-113	Not Detected	---	3.01E-02
TA-182	Not Detected	---	1.27E-01
TA-183	Not Detected	---	3.93E-01
TC-99m	Not Detected	---	8.42E-01
TL-201	Not Detected	---	1.99E-01
XE-133	Not Detected	---	1.78E-01
Y-88	Not Detected	---	1.95E-02
ZN-65	Not Detected	---	8.96E-02
ZR-95	Not Detected	---	4.65E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-23-98 8:17:52 PM *
****

* Analyzed by: 9/24/98 Reviewed by: 9/24/98 *

Customer : M.YOUNG/R.PARKER (6134/SMO)
Customer Sample ID : 042933-001
Lab Sample ID : 80198904

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 959.000 gram
Sample Date/Time : 9-22-98 11:00:00 AM
Acquire Start Date/Time : 9-23-98 6:35:07 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.02E-01
RA-226	1.10E+00	6.65E-01	5.13E-01
PB-214	5.18E-01	9.85E-02	3.49E-02
BI-214	4.46E-01	8.46E-02	3.62E-02
PB-210	Not Detected	---	2.88E+01
TH-232	6.64E-01	3.64E-01	1.25E-01
RA-228	6.84E-01	2.14E-01	1.25E-01
AC-228	6.89E-01	4.06E-01	1.97E-01
TH-228	4.88E-01	1.91E-01	3.99E-01
RA-224	6.14E-01	1.81E-01	5.22E-02
PB-212	6.57E-01	1.10E-01	3.07E-02
BI-212	8.32E-01	2.94E-01	2.38E-01
TL-208	5.58E-01	2.70E-01	5.16E-02
U-235	Not Detected	---	1.91E-01
TH-231	Not Detected	---	1.89E+00
PA-231	Not Detected	---	3.11E+00
TH-227	Not Detected	---	2.80E-01
RA-223	Not Detected	---	1.77E-01
RN-219	Not Detected	---	3.06E-01
PB-211	Not Detected	---	6.91E-01
TL-207	Not Detected	---	1.10E+01
AM-241	Not Detected	---	3.86E-01
PU-239	Not Detected	---	3.77E+02
NP-237	~~3.36E-01~~	~~1.58E-01~~	2.53E-01 Not detected 9/24/98
PA-233	Not Detected	---	4.64E-02
TH-229	Not Detected	---	2.16E-01

[Summary Report] - Sample ID: : 80198904

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.35E-02
AG-110m	Not Detected	---	3.12E-02
BA-133	Not Detected	---	5.05E-02
BE-7	Not Detected	---	2.15E-01
CD-109	Not Detected	---	8.58E-01
CD-115	Not Detected	---	8.21E-02
CE-139	Not Detected	---	2.39E-02
CE-141	Not Detected	---	4.35E-02
CE-144	Not Detected	---	2.03E-01
CO-56	Not Detected	---	2.76E-02
CO-57	Not Detected	---	2.55E-02
CO-58	Not Detected	---	2.63E-02
CO-60	Not Detected	---	3.00E-02
CR-51	Not Detected	---	1.98E-01
CS-134	Not Detected	---	3.71E-02
CS-137	7.30E-02	2.84E-02	1.83E-02
EU-152	Not Detected	---	7.68E-02
EU-154	Not Detected	---	1.54E-01
EU-155	Not Detected	---	6.24E-02
FE-59	Not Detected	---	6.11E-02
GD-153	Not Detected	---	9.02E-02
HG-203	Not Detected	---	2.63E-02
I-131	Not Detected	---	2.55E-02
IR-192	Not Detected	---	2.24E-02
K-40	2.08E+01	2.96E+00	1.92E-01
KR-85	Not Detected	---	6.41E+00
MN-52	Not Detected	---	2.80E-02
MN-54	Not Detected	---	2.84E-02
MO-99	Not Detected	---	2.68E-01
NA-22	Not Detected	---	3.88E-02
NA-24	Not Detected	---	1.21E-01
NB-95	Not Detected	---	1.67E-01
ND-147	Not Detected	---	1.75E-01
NI-57	Not Detected	---	6.89E-02
NP-239	Not Detected	---	1.17E-01
RU-103	Not Detected	---	2.39E-02
RU-106	Not Detected	---	2.33E-01
SB-122	Not Detected	---	4.50E-02
SB-124	Not Detected	---	2.39E-02
SB-125	Not Detected	---	6.60E-02
SN-113	Not Detected	---	3.04E-02
TA-182	Not Detected	---	1.22E-01
TA-183	Not Detected	---	3.95E-01
TC-99m	Not Detected	---	9.90E-01
TL-201	Not Detected	---	2.02E-01
XE-133	Not Detected	---	1.81E-01
Y-88	Not Detected	---	1.74E-02
ZN-65	Not Detected	---	8.47E-02
ZR-95	Not Detected	---	4.58E-02

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-23-98 10:02:49 PM *
****

* Analyzed by: 9/24/98 Reviewed by: 9/24/98 *

Customer : M.YOUNG/R.PARKER (6134/SMO)
Customer Sample ID : 042938-001
Lab Sample ID : 80198905

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 909.000 gram
Sample Date/Time : 9-22-98 11:20:00 AM
Acquire Start Date/Time : 9-23-98 8:20:04 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	8.54E-01	4.30E-01	5.31E-01
RA-226	1.30E+00	5.97E-01	5.29E-01
PB-214	5.38E-01	8.29E-02	3.72E-02
BI-214	5.01E-01	1.06E-01	3.85E-02
PB-210	Not Detected	---	2.91E+01
TH-232	7.17E-01	3.51E-01	1.28E-01
RA-228	8.26E-01	2.79E-01	1.43E-01
AC-228	8.08E-01	7.04E-01	2.03E-01
TH-228	7.38E-01	2.20E-01	4.04E-01
RA-224	8.36E-01	2.31E-01	5.68E-02
PB-212	7.68E-01	1.33E-01	3.34E-02
BI-212	7.55E-01	3.47E-01	2.76E-01
TL-208	6.37E-01	2.48E-01	5.99E-02
U-235	Not Detected	---	2.06E-01
TH-231	Not Detected	---	1.97E+00
PA-231	Not Detected	---	3.26E+00
TH-227	Not Detected	---	3.04E-01
RA-223	Not Detected	---	1.89E-01
RN-219	Not Detected	---	3.16E-01
PB-211	Not Detected	---	7.32E-01
TL-207	Not Detected	---	1.17E+01
AM-241	Not Detected	---	4.04E-01
PU-239	Not Detected	---	3.85E+02
NP-237	Not Detected	---	3.44E-01
PA-233	Not Detected	---	4.87E-02
TH-229	Not Detected	---	2.23E-01

[Summary Report] - Sample ID: : 80198905

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.47E-02
AG-110m	Not Detected	---	2.93E-02
BA-133	Not Detected	---	5.37E-02
BE-7	Not Detected	---	2.18E-01
CD-109	~~1.41E+00~~	~~6.92E-01~~	1.02E+00
CD-115	Not Detected	---	8.71E-02
CE-139	Not Detected	---	2.55E-02
CE-141	Not Detected	---	4.77E-02
CE-144	Not Detected	---	2.10E-01
CO-56	Not Detected	---	2.84E-02
CO-57	Not Detected	---	2.64E-02
CO-58	Not Detected	---	2.71E-02
CO-60	Not Detected	---	2.94E-02
CR-51	Not Detected	---	2.01E-01
CS-134	Not Detected	---	3.96E-02
CS-137	3.28E-02	1.91E-02	1.72E-02
EU-152	Not Detected	---	7.93E-02
EU-154	Not Detected	---	1.60E-01
EU-155	Not Detected	---	1.33E-01
FE-59	Not Detected	---	6.28E-02
GD-153	Not Detected	---	9.26E-02
HG-203	Not Detected	---	2.71E-02
I-131	Not Detected	---	2.76E-02
IR-192	Not Detected	---	2.29E-02
K-40	1.95E+01	2.81E+00	2.01E-01
KR-85	Not Detected	---	6.64E+00
MN-52	Not Detected	---	2.98E-02
MN-54	Not Detected	---	3.06E-02
MO-99	Not Detected	---	2.83E-01
NA-22	Not Detected	---	3.84E-02
NA-24	Not Detected	---	1.28E-01
NB-95	Not Detected	---	1.83E-01
ND-147	Not Detected	---	1.85E-01
NI-57	Not Detected	---	3.99E-02
NP-239	Not Detected	---	1.19E-01
RU-103	Not Detected	---	2.56E-02
RU-106	Not Detected	---	2.39E-01
SB-122	Not Detected	---	4.70E-02
SB-124	Not Detected	---	2.54E-02
SB-125	Not Detected	---	6.65E-02
SN-113	Not Detected	---	3.10E-02
TA-182	Not Detected	---	1.26E-01
TA-183	Not Detected	---	4.14E-01
TC-99m	Not Detected	---	1.24E+00
TL-201	Not Detected	---	2.12E-01
XE-133	Not Detected	---	1.93E-01
Y-88	Not Detected	---	1.85E-02
ZN-65	Not Detected	---	8.42E-02
ZR-95	Not Detected	---	4.91E-02

Not detected
9/24/98

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9-24-98 9:50:48 AM *
****

* Analyzed by: 9/24/98 Reviewed by: AM 9/24/98 *

Customer : M.YOUNG/R.PARKER (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 80198906

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11-01-90 12:00:00 PM
Acquire Start Date/Time : 9-24-98 9:38:51 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	4.59E+03
RA-226	Not Detected	---	6.11E+03
PB-214	Not Detected	---	7.10E+02
BI-214	Not Detected	---	6.18E+02
PB-210	Not Detected	---	2.69E+05
TH-232	Not Detected	---	2.21E+03
RA-228	Not Detected	---	2.51E+03
AC-228	Not Detected	---	1.48E+03
TH-228	Not Detected	---	1.20E+05
RA-224	Not Detected	---	4.73E+03
PB-212	Not Detected	---	8.79E+03
BI-212	Not Detected	---	7.66E+04
TL-208	Not Detected	---	1.60E+04
U-235	Not Detected	---	1.73E+03
TH-231	Not Detected	---	2.08E+04
PA-231	Not Detected	---	3.54E+04
TH-227	Not Detected	---	2.52E+03
RA-223	Not Detected	---	1.00E+26
RN-219	Not Detected	---	5.89E+03
PB-211	Not Detected	---	1.33E+04
TL-207	Not Detected	---	2.14E+05
AM-241	8.10E+04	1.44E+04	3.17E+03
PU-239	Not Detected	---	3.18E+06
NP-237	Not Detected	---	2.35E+03
PA-233	Not Detected	---	6.05E+02
TH-229	Not Detected	---	1.76E+03

[Summary Report] - Sample ID: : 80198906

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---	3.32E+02
AG-110m	Not Detected	---	4.97E+06
BA-133	Not Detected	---	7.43E+02
BE-7	Not Detected	---	6.86E+19
CD-109	3.17E+05	4.27E+05	4.15E+05
CD-115	Not Detected	---	1.00E+26
CE-139	Not Detected	---	4.67E+08
CE-141	Not Detected	---	1.00E+26
CE-144	Not Detected	---	1.99E+06
CO-56	Not Detected	---	6.43E+13
CO-57	Not Detected	---	3.44E+05
CO-58	Not Detected	---	5.74E+14
CO-60	7.96E+04	1.08E+04	3.91E+02
CR-51	Not Detected	---	1.00E+26
CS-134	Not Detected	---	4.14E+03
CS-137	7.20E+04	9.58E+03	2.65E+02
EU-152	Not Detected	---	9.94E+02
EU-154	Not Detected	---	2.77E+03
EU-155	Not Detected	---	3.34E+03
FE-59	Not Detected	---	2.50E+22
GD-153	Not Detected	---	2.86E+06
HG-203	Not Detected	---	1.26E+21
I-131	Not Detected	---	1.00E+26
IR-192	Not Detected	---	1.63E+14
K-40	Not Detected	---	1.53E+03
KR-85	Not Detected	---	1.21E+05
MN-52	Not Detected	---	1.00E+26
MN-54	Not Detected	---	2.08E+05
MO-99	Not Detected	---	1.00E+26
NA-22	Not Detected	---	1.58E+03
NA-24	Not Detected	---	1.00E+26
NB-95	Not Detected	---	1.00E+26
ND-147	Not Detected	---	1.00E+26
NI-57	Not Detected	---	1.00E+26
NP-239	Not Detected	---	9.26E+02
RU-103	Not Detected	---	1.00E+26
RU-106	Not Detected	---	6.78E+05
SB-122	Not Detected	---	1.00E+26
SB-124	Not Detected	---	7.60E+16
SB-125	Not Detected	---	8.19E+03
SN-113	Not Detected	---	1.57E+10
TA-182	Not Detected	---	3.94E+10
TA-183	Not Detected	---	1.00E+26
TC-99m	Not Detected	---	1.00E+26
TL-201	Not Detected	---	1.00E+26
XE-133	Not Detected	---	1.00E+26
Y-88	Not Detected	---	2.42E+10
ZN-65	Not Detected	---	3.03E+06
ZR-95	Not Detected	---	1.97E+16

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 9-24-98 9:51:27 AM
QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 80198906
Sample Quantity : 1.00 Each
Sample Date : 11-01-90 12:00:00 PM
Measurement Date : 9-24-98 9:38:51 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
AM-241 Activity	8.222E-02	4.252E-03	8.101E-02	<	:	:	>
CS-137 Activity	7.044E-02	2.028E-03	7.200E-02	<	:	:	>
CO-60 Activity	7.837E-02	2.212E-03	7.963E-02	<	:	:	>

Flags Key:
LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 9/24/98

SF 2001-COC (10-97)
Supersedes (5-97) Issue

Internal Lab Batch No. 801992

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SAR/WR No.

AR/COC- 600857

Dept. No./Mail Stop: 6134 MS-1148
Project/Task Manager: Caroline Byrd site 8 KM
Project Name: (8/58 Waste Char. Sampling)
Record Center Code: ER/1303/8-58/DAT
Logbook Ref. No.: 021
Service Order No.: CF0614

Date Samples Shipped: 9/23/98 SMO USE
Carrier/Waybill No.: HC
Lab Contact;: Fernando Dominguez
Lab Destination: RPSD Bldg. 606 / 844-7683
SMO Contact/Phone: Doug Salmi / 844-3110
Send Report to SMO: Suzi Montano/844-3184

Contract No.: NA
Case No.: 7213.2201
SMO Authorization
Bill to: Sandia National Laboratories
Supplier Services, Dept.
P.O. Box 5800 MS 0154

Location Tech Area NA
Building NA Room NA

Reference LOV (available at SMO)

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested	LAB USE Lab Sample ID
042920-001	58B-GR-101-0-SS	0	58B	9/22/98 1020	S	M	500 ML	None	GR	SA	Gamma Spec	
042921-001	58B-GR-102-0-SS			1030								
042922-001	58B-GR-103-0-SS			1038								
042924-001	58B-GR-105-0-SS			1042								
042925-001	58B-GR-106-0-SS			1045								
042926-001	58B-GR-107-0-SS			1048								
042927-001	58B-GR-108-0-SS			1050								
042929-001	58B-GR-110-0-SS			1055								
042930-001	58B-GR-111-0-SS			1055								
042931-001	58B-GR-112-0-SS			1100								

RMMA ☒Yes ☐No Ref. No. ____

Sample Disposal ☐Return to Client ☒Disposal by lab

Sample Tracking SMO USE
Date Entered (mm/dd/yy) ____
Entered by: ____

Turnaround Time ☒Normal ☒Rush Required Report Date

QC inits. ____

Special Instructions/QC Requirements
EDD ☐Yes ☒No
Raw data package ☐Yes ☒No
*Send Copy of report to Mike Young/ 284-2595.
*List as separate report.
~~*RUSH-RUSH-RUSH-RUSH-RUSH-RUSH~~ KD

Abnormal Conditions on Receipt LAB USE

Sample Team Members	Name	Signature	Init	Company/Organization/Phon
	Karen DeMoss		KD	MDM 0131 284 2590
	John Boyd		JB	IT/6131/284-3307

1. Relinquished by		Org. IT 6131	Date 9-23-98	Time 1236	4. Relinquished by	Org.	Date
1. Received by		Org. 7578	Date 9-23-98	Time 1236	4. Received by	Org.	Date
2. Relinquished by		Org. 7577	Date 9-23-98	Time 13:45	5. Relinquished by	Org.	Date
2. Received by		Org. SNL7578	Date 9/23/98	Time 1345	5. Received by	Org.	Date
3. Relinquished by		Org. SNL7578	Date 9/30/98	Time 1435	6. Relinquished by	Org.	Date
3. Received by		Org. SMO 7577	Date 9/30/98	Time 1435	6. Received by	Org.	Date

Original To Accompany Samples, Laboratory Copy (White)
1st Copy To Accompany Samples, Return to SMO (Blue)
2nd Copy SMO Suspense Copy (Yellow)
3rd Copy Field Copy (Pink)

SF 2001-COC (10-97)

Supersedes (5-97) Issue BATCH 801992

ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AR/COC- 600857

Project Name: 8/58 Waste Char. Sampling | Project/Task Manager: Caroline Byrd | Case No.: 7213.2201

Location | Tech Area NA | Building NA | Room NA

Reference LOV (available at SMO)

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Sample Collection Method	Sample Type	Parameter & Method Requested	LAB USE Lab Sample ID
042932-001	58B-GR-113-0-SS	0	58	9/22/98 1100	S	M	500 ML	None	GR	SA	Gamma Spec	
042934-001	58B-GR-115-0-SS			1110								
042935-001	58B-GR-116-0-SS			1110								
042936-001	58B-GR-117-0-SS			1110								
042937-001	58B-GR-118-0-SS			1115								
042939-001	58B-GR-120-0-SS			1120								
042940-001	58B-GR-121-0-EB			1125	DIW					EB		
042941-001	58B-GR-122-0-DU			1035	S					DU		

Abnormal Conditions on Receipt LAB USE

Recipient Initials _____

Original To Accompany Samples, Laboratory Copy (White) | **1st Copy** To Accompany Samples, Return to SMO (Blue) | **2nd Copy** SMO Suspense Copy (Yellow) | **3rd Copy** Field Copy (Pink)

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/25/98 8:42:54 PM *
****

* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042920-001
Lab Sample ID : 80199201

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 865.000 gram
Sample Date/Time : 9/22/98 10:20:00 AM
Acquire Start Date/Time : 9/25/98 7:02:41 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.07E-001
RA-226	1.53E+000	8.44E-001	5.19E-001
PB-214	6.72E-001	1.44E-001	4.79E-002
BI-214	5.81E-001	1.31E-001	4.29E-002
PB-210	Not Detected	---	7.41E+000
TH-232	8.46E-001	4.44E-001	1.41E-001
RA-228	9.98E-001	3.14E+000	1.54E-001
AC-228	8.29E-001	2.41E-001	8.61E-002
TH-228	7.21E-001	2.76E-001	4.53E-001
RA-224	8.54E-001	2.64E-001	1.02E-001
PB-212	8.57E-001	1.35E+000	1.28E-001
BI-212	8.22E-001	4.67E-001	3.04E-001
TL-208	7.64E-001	3.40E-001	6.89E-002
U-235	1.33E-001	1.68E-001	1.96E-001
TH-231	.222 ~~3.00E-001~~	~~3.83E+000~~ .191	7.00E+000
PA-231	Not Detected	---	1.25E+000
TH-227	Not Detected	---	2.73E-001
RA-223	Not Detected	---	1.41E-001
RN-219	Not Detected	---	3.53E-001
PB-211	Not Detected	---	7.82E-001
TL-207	Not Detected	---	1.41E+001
AM-241	Not Detected	---	1.94E-001
PU-239	Not Detected	---	3.42E+002
NP-237	Not Detected	---	2.39E-001
PA-233	Not Detected	---	5.48E-002
TH-229	Not Detected	---	1.65E-001

[Summary Report] - Sample ID: : 80199201

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.76E-002
AG-110m	Not Detected	---------	3.25E-002
BA-133	Not Detected	---------	4.62E-002
BE-7	Not Detected	---------	2.50E-001
CD-109	Not Detected	---------	7.99E-001
CD-115	Not Detected	---------	1.83E-001
CE-139	Not Detected	---------	2.37E-002
CE-141	Not Detected	---------	4.57E-002
CE-144	Not Detected	---------	1.88E-001
CO-56	Not Detected	---------	3.72E-002
CO-57	Not Detected	---------	2.41E-002
CO-58	Not Detected	---------	3.36E-002
CO-60	Not Detected	---------	3.99E-002
CR-51	Not Detected	---------	2.27E-001
CS-134	Not Detected	---------	3.13E-002
CS-137	Not Detected	---------	3.60E-002
EU-152	Not Detected	---------	7.24E-002
EU-154	Not Detected	---------	1.83E-001
EU-155	Not Detected	---------	1.11E-001
FE-59	Not Detected	---------	8.14E-002
GD-153	Not Detected	---------	6.55E-002
HG-203	Not Detected	---------	3.00E-002
I-131	Not Detected	---------	3.40E-002
IR-192	Not Detected	---------	2.63E-002
K-40	1.99E+001	3.00E+000	4.51E-001
MN-52	Not Detected	---------	5.09E-002
MN-54	Not Detected	---------	3.55E-002
MO-99	Not Detected	---------	5.46E-001
NA-22	Not Detected	---------	4.57E-002
NA-24	Not Detected	---------	1.57E+000
NB-95	Not Detected	---------	1.88E-001
ND-147	Not Detected	---------	2.31E-001
NI-57	Not Detected	---------	2.56E-001
RU-103	Not Detected	---------	2.78E-002
RU-106	Not Detected	---------	2.88E-001
SB-122	Not Detected	---------	8.90E-002
SB-124	Not Detected	---------	2.73E-002
SB-125	Not Detected	---------	7.68E-002
SN-113	Not Detected	---------	3.54E-002
SR-85	Not Detected	---------	3.59E-002
TA-182	Not Detected	---------	1.65E-001
TA-183	Not Detected	---------	2.62E-001
TC-99m	Not Detected	---------	2.71E+002
TL-201	Not Detected	---------	1.96E-001
XE-133	Not Detected	---------	2.33E-001
Y-88	Not Detected	---------	2.94E-002
ZN-65	Not Detected	---------	1.08E-001
ZR-95	Not Detected	---------	5.97E-002

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Sandia National Laboratories
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Radiation Protection Sample Diagnostics Program [806 Laboratory]
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9/25/98 10:24:57 PM
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* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
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Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042921-001
Lab Sample ID : 80199202

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 920.000 gram
Sample Date/Time : 9/22/98 10:30:00 AM
Acquire Start Date/Time : 9/25/98 8:44:43 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.71E-001
RA-226	1.08E+000	6.75E-001	4.80E-001
PB-214	5.13E-001	1.22E-001	4.26E-002
BI-214	4.81E-001	4.21E-001	4.25E-002
PB-210	Not Detected	---	7.05E+000
TH-232	7.26E-001	3.96E-001	1.37E-001
RA-228	7.86E-001	1.49E+000	1.33E-001
AC-228	7.20E-001	2.10E-001	8.26E-002
TH-228	7.13E-001	2.36E-001	4.58E-001
RA-224	8.80E-001	3.45E-001	8.73E-002
PB-212	7.23E-001	5.56E-001	1.20E-001
BI-212	8.08E-001	4.86E-001	3.18E-001
TL-208	6.61E-001	1.82E-001	6.70E-002
U-235	2.46E-002	1.53E-001	1.76E-001
TH-231	Not Detected	---	6.40E+000
PA-231	Not Detected	---	1.20E+000
TH-227	Not Detected	---	2.51E-001
RA-223	Not Detected	---	1.28E-001
RN-219	Not Detected	---	3.28E-001
PB-211	Not Detected	---	7.08E-001
TL-207	Not Detected	---	1.34E+001
AM-241	Not Detected	---	1.76E-001
PU-239	Not Detected	---	3.21E+002
NP-237	Not Detected	---	2.18E-001
PA-233	Not Detected	---	4.99E-002
TH-229	Not Detected	---	1.52E-001

[Summary Report] - Sample ID: : 80199202

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.54E-002
AG-110m	Not Detected	---------	3.12E-002
BA-133	Not Detected	---------	4.22E-002
BE-7	Not Detected	---------	2.36E-001
CD-109	Not Detected	---------	7.17E-001
CD-115	Not Detected	---------	1.73E-001
CE-139	Not Detected	---------	2.25E-002
CE-141	Not Detected	---------	4.13E-002
CE-144	Not Detected	---------	1.73E-001
CO-56	Not Detected	---------	3.20E-002
CO-57	Not Detected	---------	2.27E-002
CO-58	Not Detected	---------	3.12E-002
CO-60	Not Detected	---------	3.74E-002
CR-51	Not Detected	---------	2.19E-001
CS-134	Not Detected	---------	2.81E-002
CS-137	1.85E-002	3.22E-002	2.00E-002
EU-152	Not Detected	---------	6.82E-002
EU-154	Not Detected	---------	1.71E-001
EU-155	Not Detected	---------	1.03E-001
FE-59	Not Detected	---------	8.04E-002
GD-153	Not Detected	---------	6.15E-002
HG-203	Not Detected	---------	2.74E-002
I-131	Not Detected	---------	3.17E-002
IR-192	Not Detected	---------	2.41E-002
K-40	1.94E+001	2.92E+000	4.14E-001
MN-52	Not Detected	---------	4.74E-002
MN-54	Not Detected	---------	3.48E-002
MO-99	Not Detected	---------	5.38E-001
NA-22	Not Detected	---------	4.26E-002
NA-24	Not Detected	---------	1.52E+000
NB-95	Not Detected	---------	1.75E-001
ND-147	Not Detected	---------	2.17E-001
NI-57	Not Detected	---------	2.27E-001
RU-103	Not Detected	---------	2.61E-002
RU-106	Not Detected	---------	2.58E-001
SB-122	Not Detected	---------	8.49E-002
SB-124	Not Detected	---------	2.48E-002
SB-125	Not Detected	---------	6.83E-002
SN-113	Not Detected	---------	3.25E-002
SR-85	Not Detected	---------	3.31E-002
TA-182	Not Detected	---------	1.51E-001
TA-183	Not Detected	---------	2.40E-001
TC-99m	Not Detected	---------	2.95E+002
TL-201	Not Detected	---------	1.81E-001
XE-133	Not Detected	---------	2.16E-001
Y-88	Not Detected	---------	2.77E-002
ZN-65	Not Detected	---------	1.04E-001
ZR-95	Not Detected	---------	5.39E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/26/98 12:06:59 AM *
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* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
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Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042922-001
Lab Sample ID : 80199203

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 910.000 gram
Sample Date/Time : 9/22/98 10:38:00 AM
Acquire Start Date/Time : 9/25/98 10:26:46 PM
Detector Name : LAB0i
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.59E-001
RA-226	1.25E+000	2.13E+000	5.05E-001
PB-214	4.88E-001	5.95E-001	4.49E-002
BI-214	4.66E-001	1.15E-001	4.42E-002
PB-210	Not Detected	---	7.24E+000
TH-232	7.33E-001	3.90E-001	1.31E-001
RA-228	7.92E-001	5.76E+000	1.58E-001
AC-228	6.74E-001	1.83E-001	8.50E-002
TH-228	5.51E-001	2.21E-001	4.34E-001
RA-224	9.67E-001	3.48E-001	8.25E-002
PB-212	7.38E-001	1.58E-001	1.21E-001
BI-212	7.85E-001	7.99E+000	3.38E-001
TL-208	6.57E-001	1.61E-001	7.34E-002
U-235	2.65E-002	1.57E-001	1.80E-001
TH-231	Not Detected	---	6.32E+000
PA-231	Not Detected	---	1.21E+000
TH-227	Not Detected	---	2.55E-001
RA-223	Not Detected	---	1.31E-001
RN-219	Not Detected	---	3.17E-001
PB-211	Not Detected	---	7.18E-001
TL-207	Not Detected	---	1.33E+001
AM-241	Not Detected	---	1.79E-001
PU-239	Not Detected	---	3.28E+002
NP-237	Not Detected	---	2.24E-001
PA-233	Not Detected	---	5.35E-002
TH-229	Not Detected	---	1.54E-001

[Summary Report] - Sample ID: : 80199203

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.78E-002
AG-110m	Not Detected	---	3.12E-002
BA-133	Not Detected	---	4.22E-002
BE-7	Not Detected	---	2.13E-001
CD-109	~~1.57E+000~~	~~6.69E-001~~	6.02E-001
CD-115	Not Detected	---	1.80E-001
CE-139	Not Detected	---	2.28E-002
CE-141	Not Detected	---	4.16E-002
CE-144	Not Detected	---	1.80E-001
CO-56	Not Detected	---	3.50E-002
CO-57	Not Detected	---	2.28E-002
CO-58	Not Detected	---	3.22E-002
CO-60	Not Detected	---	4.42E-002
CR-51	Not Detected	---	2.28E-001
CS-134	Not Detected	---	3.05E-002
CS-137	3.17E-002	3.43E-002	1.99E-002
EU-152	Not Detected	---	6.82E-002
EU-154	Not Detected	---	1.78E-001
EU-155	Not Detected	---	1.04E-001
FE-59	Not Detected	---	8.26E-002
GD-153	Not Detected	---	6.34E-002
HG-203	Not Detected	---	2.83E-002
I-131	Not Detected	---	3.27E-002
IR-192	Not Detected	---	2.52E-002
K-40	2.34E+001	3.42E+000	4.09E-001
MN-52	Not Detected	---	5.05E-002
MN-54	Not Detected	---	2.41E-002
MO-99	Not Detected	---	5.46E-001
NA-22	Not Detected	---	4.67E-002
NA-24	Not Detected	---	1.69E+000
NB-95	Not Detected	---	1.80E-001
ND-147	Not Detected	---	2.32E-001
NI-57	Not Detected	---	2.66E-001
RU-103	Not Detected	---	2.64E-002
RU-106	Not Detected	---	2.85E-001
SB-122	Not Detected	---	9.13E-002
SB-124	Not Detected	---	2.72E-002
SB-125	Not Detected	---	7.15E-002
SN-113	Not Detected	---	3.23E-002
SR-85	Not Detected	---	3.27E-002
TA-182	Not Detected	---	1.54E-001
TA-183	Not Detected	---	2.46E-001
TC-99m	Not Detected	---	3.69E+002
TL-201	Not Detected	---	1.80E-001
XE-133	Not Detected	---	2.17E-001
Y-88	Not Detected	---	2.51E-002
ZN-65	Not Detected	---	1.04E-001
ZR-95	Not Detected	---	5.62E-002

Not detected
9/28/98

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/28/98 12:01:04 PM *
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* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042924-001
Lab Sample ID : 80199204

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 826.000 gram
Sample Date/Time : 9/22/98 10:42:00 AM
Acquire Start Date/Time : 9/26/98 11:00:15 AM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.90E-001
RA-226	9.13E-001	6.58E-001	5.01E-001
PB-214	5.28E-001	1.19E-001	4.64E-002
BI-214	4.68E-001	2.74E-001	4.69E-002
PB-210	Not Detected	---	7.44E+000
TH-232	6.41E-001	3.68E-001	1.49E-001
RA-228	7.80E-001	2.95E-001	1.41E-001
AC-228	7.32E-001	2.23E-001	8.97E-002
TH-228	6.80E-001	2.58E-001	4.62E-001
RA-224	8.55E-001	5.93E-001	9.75E-002
PB-212	7.18E-001	1.49E-001	1.32E-001
BI-212	6.88E-001	3.51E-001	3.07E-001
TL-208	7.51E-001	1.77E-001	7.11E-002
U-235	3.83E-002	1.62E-001	1.87E-001
TH-231	Not Detected	---	6.77E+000
PA-231	Not Detected	---	1.23E+000
TH-227	Not Detected	---	2.67E-001
RA-223	Not Detected	---	1.36E-001
RN-219	Not Detected	---	3.37E-001
PB-211	Not Detected	---	7.70E-001
TL-207	Not Detected	---	1.36E+001
AM-241	Not Detected	---	1.78E-001
PU-239	Not Detected	---	3.41E+002
NP-237	Not Detected	---	2.24E-001
PA-233	Not Detected	---	5.38E-002
TH-229	Not Detected	---	1.55E-001

[Summary Report] - Sample ID: : 80199204

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.61E-002
AG-110m	Not Detected	---	3.05E-002
BA-133	Not Detected	---	4.42E-002
BE-7	Not Detected	---	2.28E-001
CD-109	Not Detected	---	7.51E-001
CD-115	Not Detected	---	2.19E-001
CE-139	Not Detected	---	2.34E-002
CE-141	Not Detected	---	4.45E-002
CE-144	Not Detected	---	1.88E-001
CO-56	Not Detected	---	3.49E-002
CO-57	Not Detected	---	2.26E-002
CO-58	Not Detected	---	3.27E-002
CO-60	Not Detected	---	3.84E-002
CR-51	Not Detected	---	2.28E-001
CS-134	Not Detected	---	3.33E-002
CS-137	Not Detected	---	3.26E-002
EU-152	Not Detected	---	6.76E-002
EU-154	Not Detected	---	1.73E-001
EU-155	Not Detected	---	1.10E-001
FE-59	Not Detected	---	8.31E-002
GD-153	Not Detected	---	6.54E-002
HG-203	Not Detected	---	2.96E-002
I-131	Not Detected	---	3.58E-002
IR-192	Not Detected	---	2.60E-002
K-40	2.04E+001	3.03E+000	4.57E-001
MN-52	Not Detected	---	4.86E-002
MN-54	Not Detected	---	3.54E-002
MO-99	Not Detected	---	6.55E-001
NA-22	Not Detected	---	4.56E-002
NA-24	Not Detected	---	3.29E+000
NB-95	Not Detected	---	2.05E-001
ND-147	Not Detected	---	2.30E-001
NI-57	Not Detected	---	3.39E-001
RU-103	Not Detected	---	2.73E-002
RU-106	Not Detected	---	2.70E-001
SB-122	Not Detected	---	9.99E-002
SB-124	Not Detected	---	3.06E-002
SB-125	Not Detected	---	7.27E-002
SN-113	Not Detected	---	3.42E-002
SR-85	Not Detected	---	3.51E-002
TA-182	Not Detected	---	1.54E-001
TA-183	Not Detected	---	2.62E-001
TC-99m	Not Detected	---	1.59E+003
TL-201	Not Detected	---	2.10E-001
XE-133	Not Detected	---	2.74E-001
Y-88	Not Detected	---	3.18E-002
ZN-65	Not Detected	---	1.06E-001
ZR-95	Not Detected	---	5.89E-002

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/26/98 2:22:30 PM *
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* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
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Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042925-001
Lab Sample ID : 80199205

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 953.000 gram
Sample Date/Time : 9/22/98 10:45:00 AM
Acquire Start Date/Time : 9/26/98 12:42:17 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	4.10E-001	7.63E-001	4.18E-001
RA-226	Not Detected	---	4.68E-001
PB-214	4.78E-001	9.94E-002	4.15E-002
BI-214	4.29E-001	1.04E-001	4.04E-002
PB-210	Not Detected	---	6.89E+000
TH-232	6.12E-001	3.36E-001	1.35E-001
RA-228	5.74E-001	2.22E-001	1.42E-001
AC-228	6.62E-001	2.69E-001	8.85E-002
TH-228	5.15E-001	4.45E-001	4.10E-001
RA-224	7.46E-001	2.76E-001	9.05E-002
PB-212	6.37E-001	1.42E-001	1.16E-001
BI-212	Not Detected	---	2.84E-001
TL-208	6.23E-001	1.47E-001	6.73E-002
U-235	Not Detected	---	1.70E-001
TH-231	Not Detected	---	6.35E+000
PA-231	Not Detected	---	1.14E+000
TH-227	Not Detected	---	2.42E-001
RA-223	Not Detected	---	1.29E-001
RN-219	Not Detected	---	3.14E-001
PB-211	Not Detected	---	7.08E-001
TL-207	Not Detected	---	1.32E+001
AM-241	Not Detected	---	1.64E-001
PU-239	Not Detected	---	3.08E+002
NP-237	Not Detected	---	2.07E-001
PA-233	Not Detected	---	5.07E-002
TH-229	Not Detected	---	1.51E-001

[Summary Report] - Sample ID: : 80199205

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.43E-002
AG-110m	Not Detected	---------	3.39E-002
BA-133	Not Detected	---------	4.02E-002
BE-7	4.99E-002	2.65E-002	8.34E-002
CD-109	Not Detected	---------	6.89E-001
CD-115	Not Detected	---------	2.02E-001
CE-139	Not Detected	---------	2.15E-002
CE-141	Not Detected	---------	4.07E-002
CE-144	Not Detected	---------	1.76E-001
CO-56	Not Detected	---------	3.31E-002
CO-57	Not Detected	---------	2.16E-002
CO-58	Not Detected	---------	2.94E-002
CO-60	Not Detected	---------	3.70E-002
CR-51	Not Detected	---------	2.09E-001
CS-134	Not Detected	---------	2.71E-002
CS-137	7.45E-002	3.64E-002	2.32E-002
EU-152	Not Detected	---------	6.41E-002
EU-154	Not Detected	---------	1.65E-001
EU-155	Not Detected	---------	1.01E-001
FE-59	Not Detected	---------	7.60E-002
GD-153	Not Detected	---------	6.01E-002
HG-203	Not Detected	---------	2.71E-002
I-131	Not Detected	---------	3.35E-002
IR-192	Not Detected	---------	2.34E-002
K-40	2.07E+001	3.11E+000	3.95E-001
MN-52	Not Detected	---------	4.79E-002
MN-54	Not Detected	---------	3.20E-002
MO-99	Not Detected	---------	5.79E-001
NA-22	Not Detected	---------	4.22E-002
NA-24	Not Detected	---------	2.95E+000
NB-95	Not Detected	---------	1.96E-001
ND-147	Not Detected	---------	2.18E-001
NI-57	Not Detected	---------	2.86E-001
RU-103	Not Detected	---------	2.48E-002
RU-106	Not Detected	---------	2.52E-001
SB-122	Not Detected	---------	9.54E-002
SB-124	Not Detected	---------	2.56E-002
SB-125	Not Detected	---------	6.68E-002
SN-113	Not Detected	---------	3.24E-002
SR-85	Not Detected	---------	3.09E-002
TA-182	Not Detected	---------	1.48E-001
TA-183	Not Detected	---------	2.44E-001
TC-99m	Not Detected	---------	1.79E+003
TL-201	Not Detected	---------	2.05E-001
XE-133	Not Detected	---------	2.61E-001
Y-88	Not Detected	---------	2.45E-002
ZN-65	Not Detected	---------	9.72E-002
ZR-95	Not Detected	---------	5.40E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/26/98 4:04:32 PM *
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* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
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Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042926-001
Lab Sample ID : 80199206

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 894.000 gram
Sample Date/Time : 9/22/98 10:48:00 AM
Acquire Start Date/Time : 9/26/98 2:24:19 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	4.20E-001	3.25E-001	3.99E-001
RA-226	9.92E-001	7.36E-001	4.93E-001
PB-214	4.70E-001	1.10E-001	4.17E-002
BI-214	3.75E-001	1.48E+000	4.63E-002
PB-210	Not Detected	---	6.75E+000
TH-232	6.22E-001	3.52E-001	1.38E-001
RA-228	6.80E-001	2.53E-001	1.51E-001
AC-228	5.48E-001	1.49E-001	9.41E-002
TH-228	7.68E-001	2.61E-001	4.10E-001
RA-224	7.78E-001	3.30E-001	8.96E-002
PB-212	6.48E-001	3.24E-001	1.23E-001
BI-212	6.72E-001	2.87E-001	2.91E-001
TL-208	5.58E-001	3.68E-001	6.95E-002
U-235	7.99E-002	1.53E-001	1.78E-001
TH-231	Not Detected	---	6.29E+000
PA-231	Not Detected	---	1.17E+000
TH-227	Not Detected	---	2.50E-001
RA-223	Not Detected	---	1.32E-001
RN-219	Not Detected	---	3.13E-001
PB-211	Not Detected	---	7.25E-001
TL-207	Not Detected	---	1.36E+001
AM-241	Not Detected	---	1.71E-001
PU-239	Not Detected	---	3.08E+002
NP-237	Not Detected	---	2.21E-001
PA-233	Not Detected	---	5.27E-002
TH-229	Not Detected	---	1.51E-001

[Summary Report] - Sample ID: : 80199206

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.56E-002
AG-110m	Not Detected	---	2.68E-002
BA-133	Not Detected	---	4.04E-002
BE-7	Not Detected	---	2.14E-001
CD-109	~~1.44E+000~~	~~4.80E-001~~	6.26E-001
CD-115	Not Detected	---	2.07E-001
CE-139	Not Detected	---	2.19E-002
CE-141	Not Detected	---	4.18E-002
CE-144	Not Detected	---	1.72E-001
CO-56	Not Detected	---	3.30E-002
CO-57	Not Detected	---	2.20E-002
CO-58	Not Detected	---	3.23E-002
CO-60	Not Detected	---	3.78E-002
CR-51	Not Detected	---	2.19E-001
CS-134	Not Detected	---	2.96E-002
CS-137	Not Detected	---	2.99E-002
EU-152	Not Detected	---	6.52E-002
EU-154	Not Detected	---	1.69E-001
EU-155	Not Detected	---	1.03E-001
FE-59	Not Detected	---	7.85E-002
GD-153	Not Detected	---	6.02E-002
HG-203	Not Detected	---	2.73E-002
I-131	Not Detected	---	3.50E-002
IR-192	Not Detected	---	2.48E-002
K-40	1.95E+001	2.96E+000	4.27E-001
MN-52	Not Detected	---	4.92E-002
MN-54	Not Detected	---	3.54E-002
MO-99	Not Detected	---	5.76E-001
NA-22	Not Detected	---	4.55E-002
NA-24	Not Detected	---	3.21E+000
NB-95	Not Detected	---	2.02E-001
ND-147	Not Detected	---	2.29E-001
NI-57	Not Detected	---	3.47E-001
RU-103	Not Detected	---	2.65E-002
RU-106	Not Detected	---	2.67E-001
SB-122	Not Detected	---	9.58E-002
SB-124	Not Detected	---	2.77E-002
SB-125	Not Detected	---	6.94E-002
SN-113	Not Detected	---	3.17E-002
SR-85	Not Detected	---	3.25E-002
TA-182	Not Detected	---	1.49E-001
TA-183	Not Detected	---	2.56E-001
TC-99m	Not Detected	---	2.16E+003
TL-201	Not Detected	---	2.03E-001
XE-133	Not Detected	---	2.61E-001
Y-88	Not Detected	---	3.01E-002
ZN-65	Not Detected	---	1.01E-001
ZR-95	Not Detected	---	5.56E-002

Not detected
5/28/98

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
9/26/98 5:46:56 PM
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Analyzed by: 9/28/98 Reviewed by: 9/30/98

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042927-001
Lab Sample ID : 80199207

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 850.000 gram
Sample Date/Time : 9/22/98 10:50:00 AM
Acquire Start Date/Time : 9/26/98 4:06:43 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.91E-001
RA-226	1.20E+000	7.67E-001	4.93E-001
PB-214	5.61E-001	3.21E-001	4.80E-002
BI-214	5.07E-001	1.28E-001	4.69E-002
PB-210	Not Detected	---	7.47E+000
TH-232	7.00E-001	3.85E-001	1.54E-001
RA-228	7.75E-001	2.98E-001	1.62E-001
AC-228	7.67E-001	2.24E-001	7.85E-002
TH-228	7.71E-001	2.69E-001	4.74E-001
RA-224	9.89E-001	6.50E-001	9.50E-002
PB-212	7.48E-001	5.87E-001	1.29E-001
BI-212	7.82E-001	4.83E-001	3.37E-001
TL-208	6.82E-001	1.80E-001	7.47E-002
U-235	Not Detected	---	1.88E-001
TH-231	Not Detected	---	6.85E+000
PA-231	Not Detected	---	1.25E+000
TH-227	Not Detected	---	2.69E-001
RA-223	Not Detected	---	1.43E-001
RN-219	Not Detected	---	3.35E-001
PB-211	Not Detected	---	7.48E-001
TL-207	Not Detected	---	1.38E+001
AM-241	Not Detected	---	1.87E-001
PU-239	Not Detected	---	3.33E+002
NP-237	Not Detected	---	2.38E-001
PA-233	Not Detected	---	5.41E-002
TH-229	Not Detected	---	1.58E-001

[Summary Report] - Sample ID: : 80199207

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.71E-002
AG-110m	Not Detected	---	3.15E-002
BA-133	Not Detected	---	4.41E-002
BE-7	Not Detected	---	2.25E-001
CD-109	Not Detected	---	7.90E-001
CD-115	Not Detected	---	2.34E-001
CE-139	Not Detected	---	2.43E-002
CE-141	Not Detected	---	4.48E-002
CE-144	Not Detected	---	1.90E-001
CO-56	Not Detected	---	3.33E-002
CO-57	Not Detected	---	2.37E-002
CO-58	Not Detected	---	3.72E-002
CO-60	Not Detected	---	3.96E-002
CR-51	Not Detected	---	2.30E-001
CS-134	Not Detected	---	3.14E-002
CS-137	Not Detected	---	3.50E-002
EU-152	Not Detected	---	7.06E-002
EU-154	Not Detected	---	1.77E-001
EU-155	Not Detected	---	1.11E-001
FE-59	Not Detected	---	7.85E-002
GD-153	Not Detected	---	6.37E-002
HG-203	Not Detected	---	2.92E-002
I-131	Not Detected	---	3.73E-002
IR-192	Not Detected	---	2.54E-002
K-40	2.09E+001	3.13E+000	4.45E-001
MN-52	Not Detected	---	5.43E-002
MN-54	Not Detected	---	3.63E-002
MO-99	Not Detected	---	6.68E-001
NA-22	Not Detected	---	4.76E-002
NA-24	Not Detected	---	3.56E+000
NB-95	Not Detected	---	2.19E-001
ND-147	Not Detected	---	2.45E-001
NI-57	Not Detected	---	3.58E-001
RU-103	Not Detected	---	2.80E-002
RU-106	Not Detected	---	2.71E-001
SB-122	Not Detected	---	1.11E-001
SB-124	Not Detected	---	2.79E-002
SB-125	Not Detected	---	7.61E-002
SN-113	Not Detected	---	3.30E-002
SR-85	Not Detected	---	3.42E-002
TA-182	Not Detected	---	1.65E-001
TA-183	Not Detected	---	2.84E-001
TC-99m	Not Detected	---	2.87E+003
TL-201	Not Detected	---	2.28E-001
XE-133	Not Detected	---	2.98E-001
Y-88	Not Detected	---	2.84E-002
ZN-65	Not Detected	---	1.07E-001
ZR-95	Not Detected	---	5.64E-002

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/26/98 7:29:21 PM *
****

* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042929-001
Lab Sample ID : 80199208

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 1011.000 gram
Sample Date/Time : 9/22/98 10:55:00 AM
Acquire Start Date/Time : 9/26/98 5:49:08 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.36E-001
RA-226	Not Detected	---	4.54E-001
PB-214	4.77E-001	1.07E-001	3.98E-002
BI-214	4.09E-001	2.76E-001	4.22E-002
PB-210	Not Detected	---	6.62E+000
TH-232	6.58E-001	3.62E-001	1.32E-001
RA-228	6.56E-001	2.88E-001	1.62E-001
AC-228	7.48E-001	2.09E-001	8.39E-002
TH-228	6.01E-001	6.48E+000	3.64E-001
RA-224	8.95E-001	3.46E-001	8.37E-002
PB-212	7.14E-001	1.40E-001	1.10E-001
BI-212	8.43E-001	4.50E-001	3.10E-001
TL-208	6.71E-001	1.59E-001	6.31E-002
U-235	7.11E-002	1.47E-001	1.69E-001
TH-231	Not Detected	---	6.06E+000
PA-231	Not Detected	---	1.12E+000
TH-227	Not Detected	---	2.43E-001
RA-223	Not Detected	---	1.32E-001
RN-219	Not Detected	---	2.96E-001
PB-211	Not Detected	---	6.76E-001
TL-207	Not Detected	---	1.25E+001
AM-241	Not Detected	---	1.67E-001
PU-239	Not Detected	---	3.10E+002
NP-237	Not Detected	---	2.07E-001
PA-233	Not Detected	---	5.01E-002
TH-229	Not Detected	---	1.45E-001

[Summary Report] - Sample ID: : 80199208

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.39E-002
AG-110m	Not Detected	---	3.31E-002
BA-133	Not Detected	---	3.78E-002
BE-7	Not Detected	---	2.14E-001
CD-109	Not Detected	---	6.84E-001
CD-115	Not Detected	---	2.09E-001
CE-139	Not Detected	---	2.16E-002
CE-141	Not Detected	---	4.04E-002
CE-144	Not Detected	---	1.66E-001
CO-56	Not Detected	---	3.29E-002
CO-57	Not Detected	---	2.11E-002
CO-58	Not Detected	---	2.94E-002
CO-60	Not Detected	---	3.65E-002
CR-51	Not Detected	---	2.18E-001
CS-134	Not Detected	---	2.72E-002
CS-137	3.99E-002	3.43E-002	2.38E-002
EU-152	Not Detected	---	6.27E-002
EU-154	Not Detected	---	1.60E-001
EU-155	Not Detected	---	1.01E-001
FE-59	Not Detected	---	7.34E-002
GD-153	Not Detected	---	5.86E-002
HG-203	Not Detected	---	2.69E-002
I-131	Not Detected	---	3.18E-002
IR-192	Not Detected	---	2.45E-002
K-40	2.02E+001	2.97E+000	3.79E-001
MN-52	Not Detected	---	4.88E-002
MN-54	Not Detected	---	3.19E-002
MO-99	Not Detected	---	6.25E-001
NA-22	Not Detected	---	4.08E-002
NA-24	Not Detected	---	3.83E+000
NB-95	Not Detected	---	1.98E-001
ND-147	Not Detected	---	2.20E-001
NI-57	Not Detected	---	3.40E-001
RU-103	Not Detected	---	2.33E-002
RU-106	Not Detected	---	2.52E-001
SB-122	Not Detected	---	9.86E-002
SB-124	Not Detected	---	2.54E-002
SB-125	Not Detected	---	6.74E-002
SN-113	Not Detected	---	3.14E-002
SR-85	Not Detected	---	3.14E-002
TA-182	Not Detected	---	1.45E-001
TA-183	Not Detected	---	2.56E-001
TC-99m	Not Detected	---	3.11E+003
TL-201	Not Detected	---	2.05E-001
XE-133	Not Detected	---	2.66E-001
Y-88	Not Detected	---	2.27E-002
ZN-65	Not Detected	---	9.78E-002
ZR-95	Not Detected	---	5.16E-002

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*************************************************************************
*                   Sandia National Laboratories                        *
*    Radiation Protection Sample Diagnostics Program [806 Laboratory]   *
*                      9/27/98  3:44:34 PM                              *
*************************************************************************
*                                                                       *
* Analyzed by:                 9/28/98   Reviewed by:        9/30/98    *
*************************************************************************
Customer                     : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID           : 042930-001
Lab Sample ID                : 80199209

Sample Description           : MARINELLI SOLID SAMPLE
Sample Quantity              :   922.000  gram
Sample Date/Time             :  9/22/98  10:55:00 AM
Acquire Start Date/Time      :  9/27/98   2:04:20 PM
Detector Name                : LAB01
Elapsed Live/Real Time       :   6000 /   6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.58E-001
RA-226	1.40E+000	3.31E-001	4.57E-001
PB-214	4.73E-001	1.07E-001	4.34E-002
BI-214	4.41E-001	1.04E-001	3.54E-002
PB-210	Not Detected	---------	6.73E+000
TH-232	5.95E-001	3.42E-001	1.39E-001
RA-228	7.16E-001	2.73E-001	1.43E-001
AC-228	6.65E-001	2.00E-001	8.26E-002
TH-228	4.48E-001	1.84E-001	4.23E-001
RA-224	9.39E-001	3.61E-001	8.53E-002
PB-212	6.52E-001	1.55E-001	1.19E-001
BI-212	7.62E-001	4.83E-001	2.96E-001
TL-208	5.98E-001	3.84E+000	6.90E-002
U-235	Not Detected	---------	1.71E-001
TH-231	Not Detected	---------	6.18E+000
PA-231	Not Detected	---------	1.17E+000
TH-227	Not Detected	---------	2.49E-001
RA-223	Not Detected	---------	1.38E-001
RN-219	Not Detected	---------	3.18E-001
PB-211	Not Detected	---------	7.15E-001
TL-207	Not Detected	---------	1.30E+001
AM-241	Not Detected	---------	1.62E-001
PU-239	Not Detected	---------	3.08E+002
NP-237	Not Detected	---------	2.15E-001
PA-233	Not Detected	---------	5.02E-002
TH-229	Not Detected	---------	1.46E-001

[Summary Report] - Sample ID: : 80199209

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.45E-002
AG-110m	Not Detected	---	3.43E-002
BA-133	Not Detected	---	3.77E-002
BE-7	Not Detected	---	2.30E-001
CD-109	Not Detected	---	7.17E-001
CD-115	Not Detected	---	2.84E-001
CE-139	Not Detected	---	2.25E-002
CE-141	Not Detected	---	4.10E-002
CE-144	Not Detected	---	1.69E-001
CO-56	Not Detected	---	3.18E-002
CO-57	Not Detected	---	2.24E-002
CO-58	Not Detected	---	3.02E-002
CO-60	Not Detected	---	3.64E-002
CR-51	Not Detected	---	2.23E-001
CS-134	Not Detected	---	2.95E-002
CS-137	5.60E-002	2.66E-001	2.37E-002
EU-152	Not Detected	---	6.65E-002
EU-154	Not Detected	---	1.65E-001
EU-155	Not Detected	---	1.02E-001
FE-59	Not Detected	---	7.62E-002
GD-153	Not Detected	---	6.02E-002
HG-203	Not Detected	---	2.83E-002
I-131	Not Detected	---	3.56E-002
IR-192	Not Detected	---	2.42E-002
K-40	1.95E+001	2.91E+000	4.18E-001
MN-52	Not Detected	---	6.20E-002
MN-54	Not Detected	---	1.67E-002
MO-99	Not Detected	---	7.08E-001
NA-22	Not Detected	---	4.74E-002
NA-24	Not Detected	---	1.02E+001
NB-95	Not Detected	---	2.41E-001
ND-147	Not Detected	---	2.33E-001
NI-57	Not Detected	---	5.09E-001
RU-103	Not Detected	---	2.65E-002
RU-106	Not Detected	---	2.55E-001
SB-122	Not Detected	---	1.28E-001
SB-124	Not Detected	---	2.66E-002
SB-125	Not Detected	---	6.56E-002
SN-113	Not Detected	---	3.21E-002
SR-85	Not Detected	---	3.33E-002
TA-182	Not Detected	---	1.51E-001
TA-183	Not Detected	---	2.78E-001
TC-99m	Not Detected	---	3.37E+004
TL-201	Not Detected	---	2.55E-001
XE-133	Not Detected	---	3.54E-001
Y-88	Not Detected	---	2.79E-002
ZN-65	Not Detected	---	1.02E-001
ZR-95	Not Detected	---	5.50E-002

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* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/27/98 5:26:38 PM *
****
*
* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
****

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042931-001
Lab Sample ID : 80199210

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 934.000 gram
Sample Date/Time : 9/22/98 11:00:00 AM
Acquire Start Date/Time : 9/27/98 3:46:23 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
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Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.61E-001
RA-226	Not Detected	---	4.64E-001
PB-214	5.06E-001	7.41E-001	4.40E-002
BI-214	4.55E-001	1.13E-001	4.10E-002
PB-210	Not Detected	---	6.79E+000
TH-232	6.38E-001	3.20E+000	1.41E-001
RA-228	7.13E-001	2.51E-001	1.38E-001
AC-228	6.11E-001	2.03E-001	8.82E-002
TH-228	6.63E-001	2.86E-001	4.12E-001
RA-224	9.60E-001	3.61E-001	7.45E-002
PB-212	7.22E-001	6.26E-001	1.18E-001
BI-212	6.71E-001	4.46E-001	2.82E-001
TL-208	6.29E-001	5.53E-001	7.01E-002
U-235	Not Detected	---	1.72E-001
TH-231	Not Detected	---	6.52E+000
PA-231	Not Detected	---	1.17E+000
TH-227	Not Detected	---	2.58E-001
RA-223	Not Detected	---	1.40E-001
RN-219	Not Detected	---	3.28E-001
PB-211	Not Detected	---	7.07E-001
TL-207	Not Detected	---	1.24E+001
AM-241	Not Detected	---	1.71E-001
PU-239	Not Detected	---	3.24E+002
NP-237	Not Detected	---	2.12E-001
PA-233	Not Detected	---	4.90E-002
TH-229	Not Detected	---	1.49E-001

[Summary Report] - Sample ID: : 80199210

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.45E-002
AG-110m	Not Detected	---	3.14E-002
BA-133	Not Detected	---	4.00E-002
BE-7	Not Detected	---	2.22E-001
CD-109	Not Detected	---	7.01E-001
CD-115	Not Detected	---	2.91E-001
CE-139	Not Detected	---	2.22E-002
CE-141	Not Detected	---	4.17E-002
CE-144	Not Detected	---	1.75E-001
CO-56	Not Detected	---	3.27E-002
CO-57	Not Detected	---	2.20E-002
CO-58	Not Detected	---	3.13E-002
CO-60	Not Detected	---	3.88E-002
CR-51	Not Detected	---	2.27E-001
CS-134	Not Detected	---	2.96E-002
CS-137	2.99E-002	3.03E-002	2.16E-002
EU-152	Not Detected	---	6.55E-002
EU-154	Not Detected	---	1.66E-001
EU-155	Not Detected	---	1.00E-001
FE-59	Not Detected	---	7.59E-002
GD-153	Not Detected	---	6.05E-002
HG-203	Not Detected	---	2.79E-002
I-131	Not Detected	---	3.90E-002
IR-192	Not Detected	---	2.48E-002
K-40	2.00E+001	3.00E+000	4.04E-001
MN-52	Not Detected	---	5.36E-002
MN-54	Not Detected	---	3.49E-002
MO-99	Not Detected	---	7.56E-001
NA-22	Not Detected	---	4.41E-002
NA-24	Not Detected	---	1.06E+001
NB-95	Not Detected	---	2.51E-001
ND-147	Not Detected	---	2.47E-001
NI-57	Not Detected	---	5.61E-001
RU-103	Not Detected	---	2.60E-002
RU-106	Not Detected	---	2.67E-001
SB-122	Not Detected	---	1.34E-001
SB-124	Not Detected	---	2.72E-002
SB-125	Not Detected	---	6.75E-002
SN-113	Not Detected	---	3.22E-002
SR-85	Not Detected	---	3.28E-002
TA-182	Not Detected	---	1.50E-001
TA-183	Not Detected	---	2.96E-001
TC-99m	Not Detected	---	4.01E+004
TL-201	Not Detected	---	2.58E-001
XE-133	Not Detected	---	3.87E-001
Y-88	Not Detected	---	2.52E-002
ZN-65	Not Detected	---	1.02E-001
ZR-95	Not Detected	---	5.26E-002

```
*****************************************************************************
*                    Sandia National Laboratories                            *
*    Radiation Protection Sample Diagnostics Program [806 Laboratory]        *
*                       9/27/98  7:08:41 PM                                  *
*****************************************************************************
*                                                                            *
* Analyzed by:                 9/28/98     Reviewed by:          9/30/98     *
*****************************************************************************
Customer                     : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID           : 042932-001
Lab Sample ID                : 80199211

Sample Description           : MARINELLI SOLID SAMPLE
Sample Quantity              :   873.000  gram
Sample Date/Time             :  9/22/98  11:00:00 AM
Acquire Start Date/Time      :  9/27/98   5:28:27 PM
Detector Name                : LAB01
Elapsed Live/Real Time       :   6000 /   6003 seconds

Comments:
*****************************************************************************
```

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.84E-001
RA-226	1.01E+000	6.51E-001	5.03E-001
PB-214	4.72E-001	3.86E+000	4.51E-002
BI-214	4.25E-001	1.04E-001	4.39E-002
PB-210	Not Detected	---------	6.79E+000
TH-232	6.57E-001	3.69E-001	1.41E-001
RA-228	5.24E-001	2.61E-001	1.70E-001
AC-228	6.60E-001	2.07E-001	8.32E-002
TH-228	6.20E-001	1.57E+000	4.52E-001
RA-224	7.47E-001	3.21E-001	9.10E-002
PB-212	6.59E-001	1.34E+000	1.26E-001
BI-212	6.58E-001	4.95E-001	3.06E-001
TL-208	6.03E-001	1.65E-001	6.92E-002
U-235	2.36E-001	1.58E-001	1.86E-001
TH-231	Not Detected	---------	6.57E+000
PA-231	Not Detected	---------	1.22E+000
TH-227	Not Detected	---------	2.56E-001
RA-223	Not Detected	---------	1.47E-001
RN-219	Not Detected	---------	3.23E-001
PB-211	Not Detected	---------	7.32E-001
TL-207	Not Detected	---------	1.38E+001
AM-241	Not Detected	---------	1.77E-001
PU-239	Not Detected	---------	3.21E+002
NP-237	Not Detected	---------	2.21E-001
PA-233	Not Detected	---------	5.33E-002
TH-229	Not Detected	---------	1.54E-001

[Summary Report] - Sample ID: : 80199211

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.57E-002
AG-110m	Not Detected	---	3.61E-002
BA-133	Not Detected	---	4.02E-002
BE-7	Not Detected	---	2.26E-001
CD-109	Not Detected	---	7.46E-001
CD-115	Not Detected	---	3.08E-001
CE-139	Not Detected	---	2.25E-002
CE-141	Not Detected	---	4.41E-002
CE-144	Not Detected	---	1.77E-001
CO-56	Not Detected	---	3.40E-002
CO-57	Not Detected	---	2.29E-002
CO-58	Not Detected	---	3.21E-002
CO-60	Not Detected	---	4.29E-002
CR-51	Not Detected	---	2.37E-001
CS-134	Not Detected	---	3.08E-002
CS-137	4.76E-002	3.84E-002	1.81E-002
EU-152	Not Detected	---	6.78E-002
EU-154	Not Detected	---	1.69E-001
EU-155	Not Detected	---	1.06E-001
FE-59	Not Detected	---	8.51E-002
GD-153	Not Detected	---	6.22E-002
HG-203	Not Detected	---	2.91E-002
I-131	Not Detected	---	3.78E-002
IR-192	Not Detected	---	2.66E-002
K-40	2.13E+001	3.16E+000	4.38E-001
MN-52	Not Detected	---	5.90E-002
MN-54	Not Detected	---	3.55E-002
MO-99	Not Detected	---	8.43E-001
NA-22	Not Detected	---	4.65E-002
NA-24	Not Detected	---	1.13E+001
NB-95	Not Detected	---	2.55E-001
ND-147	Not Detected	---	2.48E-001
NI-57	Not Detected	---	5.62E-001
RU-103	Not Detected	---	2.75E-002
RU-106	Not Detected	---	2.72E-001
SB-122	Not Detected	---	1.39E-001
SB-124	Not Detected	---	2.77E-002
SB-125	Not Detected	---	7.10E-002
SN-113	Not Detected	---	3.39E-002
SR-85	Not Detected	---	3.48E-002
TA-182	Not Detected	---	1.63E-001
TA-183	Not Detected	---	3.09E-001
TC-99m	Not Detected	---	4.96E+004
TL-201	Not Detected	---	2.75E-001
XE-133	Not Detected	---	3.88E-001
Y-88	Not Detected	---	2.25E-002
ZN-65	Not Detected	---	1.09E-001
ZR-95	Not Detected	---	5.71E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/27/98 8:50:44 PM *
****
*
* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
****

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042934-001
Lab Sample ID : 80199212

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 1090.000 gram
Sample Date/Time : 9/22/98 11:10:00 AM
Acquire Start Date/Time : 9/27/98 7:10:30 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.21E-001
RA-226	9.96E-001	6.48E-001	4.46E-001
PB-214	4.47E-001	9.74E-002	3.95E-002
BI-214	4.43E-001	3.97E-001	3.71E-002
PB-210	Not Detected	---	6.35E+000
TH-232	5.66E-001	3.35E-001	1.23E-001
RA-228	6.64E-001	2.34E-001	1.33E-001
AC-228	7.13E-001	2.07E-001	7.32E-002
TH-228	7.17E-001	2.45E-001	3.78E-001
RA-224	6.47E-001	6.89E-001	9.04E-002
PB-212	6.15E-001	3.58E-001	1.02E-001
BI-212	6.39E-001	4.04E-001	2.58E-001
TL-208	5.84E-001	5.16E-001	6.30E-002
U-235	4.43E-002	1.40E-001	1.61E-001
TH-231	Not Detected	---	6.01E+000
PA-231	Not Detected	---	1.06E+000
TH-227	Not Detected	---	2.28E-001
RA-223	Not Detected	---	1.33E-001
RN-219	Not Detected	---	2.78E-001
PB-211	Not Detected	---	6.20E-001
TL-207	Not Detected	---	1.18E+001
AM-241	Not Detected	---	1.59E-001
PU-239	Not Detected	---	2.91E+002
NP-237	Not Detected	---	1.95E-001
PA-233	Not Detected	---	4.58E-002
TH-229	Not Detected	---	1.37E-001

[Summary Report] - Sample ID: : 80199212

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.20E-002
AG-110m	Not Detected	---------	3.39E-002
BA-133	Not Detected	---------	3.65E-002
BE-7	4.74E-002	1.67E-001	9.36E-002
CD-109	Not Detected	---------	6.51E-001
CD-115	Not Detected	---------	2.71E-001
CE-139	Not Detected	---------	2.09E-002
CE-141	Not Detected	---------	3.87E-002
CE-144	Not Detected	---------	1.62E-001
CO-56	Not Detected	---------	3.01E-002
CO-57	Not Detected	---------	2.08E-002
CO-58	Not Detected	---------	2.92E-002
CO-60	Not Detected	---------	3.36E-002
CR-51	Not Detected	---------	2.05E-001
CS-134	Not Detected	---------	2.72E-002
CS-137	7.82E-002	3.92E-002	1.87E-002
EU-152	Not Detected	---------	6.19E-002
EU-154	Not Detected	---------	1.51E-001
EU-155	Not Detected	---------	9.46E-002
FE-59	Not Detected	---------	6.92E-002
GD-153	Not Detected	---------	5.53E-002
HG-203	Not Detected	---------	2.55E-002
I-131	Not Detected	---------	3.48E-002
IR-192	Not Detected	---------	2.24E-002
K-40	1.98E+001	2.91E+000	3.48E-001
MN-52	Not Detected	---------	4.83E-002
MN-54	Not Detected	---------	1.35E-002
MO-99	Not Detected	---------	7.61E-001
NA-22	Not Detected	---------	3.81E-002
NA-24	Not Detected	---------	1.14E+001
NB-95	Not Detected	---------	2.31E-001
ND-147	Not Detected	---------	2.17E-001
NI-57	Not Detected	---------	5.07E-001
RU-103	Not Detected	---------	2.34E-002
RU-106	Not Detected	---------	2.35E-001
SB-122	Not Detected	---------	1.21E-001
SB-124	Not Detected	---------	2.44E-002
SB-125	Not Detected	---------	6.56E-002
SN-113	Not Detected	---------	2.85E-002
SR-85	Not Detected	---------	2.94E-002
TA-182	Not Detected	---------	1.43E-001
TA-183	Not Detected	---------	2.81E-001
TC-99m	Not Detected	---------	5.41E+004
TL-201	Not Detected	---------	2.47E-001
XE-133	Not Detected	---------	3.69E-001
Y-88	Not Detected	---------	2.19E-002
ZN-65	Not Detected	---------	9.39E-002
ZR-95	Not Detected	---------	4.92E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/27/98 10:32:46 PM *
****
* *
* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
****

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042935-001
Lab Sample ID : 80199213

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 1110.000 gram
Sample Date/Time : 9/22/98 11:10:00 AM
Acquire Start Date/Time : 9/27/98 8:52:33 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.45E-001
RA-226	1.03E+000	7.20E-001	4.53E-001
PB-214	4.33E-001	4.25E-001	3.99E-002
BI-214	4.14E-001	1.41E-001	3.68E-002
PB-210	Not Detected	---	6.27E+000
TH-232	5.78E-001	3.18E-001	1.23E-001
RA-228	6.88E-001	2.84E-001	1.51E-001
AC-228	6.78E-001	1.93E-001	7.17E-002
TH-228	5.38E-001	2.00E-001	3.77E-001
RA-224	8.16E-001	3.21E-001	7.23E-002
PB-212	6.85E-001	1.92E-001	9.94E-002
BI-212	7.67E-001	5.44E-001	2.54E-001
TL-208	6.00E-001	1.44E-001	6.18E-002
U-235	Not Detected	---	1.61E-001
TH-231	Not Detected	---	5.87E+000
PA-231	Not Detected	---	1.06E+000
TH-227	Not Detected	---	2.34E-001
RA-223	Not Detected	---	1.32E-001
RN-219	Not Detected	---	2.88E-001
PB-211	Not Detected	---	6.39E-001
TL-207	Not Detected	---	1.09E+001
AM-241	Not Detected	---	1.57E-001
PU-239	Not Detected	---	2.86E+002
NP-237	Not Detected	---	1.95E-001
PA-233	Not Detected	---	4.61E-002
TH-229	Not Detected	---	1.41E-001

[Summary Report] - Sample ID: : 80199213

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.18E-002
AG-110m	Not Detected	---	3.18E-002
BA-133	Not Detected	---	3.55E-002
BE-7	Not Detected	---	2.05E-001
CD-109	Not Detected	---	6.53E-001
CD-115	Not Detected	---	2.81E-001
CE-139	Not Detected	---	2.03E-002
CE-141	Not Detected	---	3.92E-002
CE-144	Not Detected	---	1.60E-001
CO-56	Not Detected	---	2.89E-002
CO-57	Not Detected	---	2.05E-002
CO-58	Not Detected	---	2.77E-002
CO-60	Not Detected	---	3.51E-002
CR-51	Not Detected	---	2.06E-001
CS-134	Not Detected	---	2.75E-002
CS-137	5.20E-002	2.15E-002	1.91E-002
EU-152	Not Detected	---	6.07E-002
EU-154	Not Detected	---	1.52E-001
EU-155	Not Detected	---	9.87E-002
FE-59	Not Detected	---	7.33E-002
GD-153	Not Detected	---	5.56E-002
HG-203	Not Detected	---	2.59E-002
I-131	Not Detected	---	3.46E-002
IR-192	Not Detected	---	2.21E-002
K-40	1.94E+001	2.88E+000	3.45E-001
MN-52	Not Detected	---	5.05E-002
MN-54	Not Detected	---	3.07E-002
MO-99	Not Detected	---	7.91E-001
NA-22	Not Detected	---	4.00E-002
NA-24	Not Detected	---	1.18E+001
NB-95	Not Detected	---	2.38E-001
ND-147	Not Detected	---	2.19E-001
NI-57	Not Detected	---	5.63E-001
RU-103	Not Detected	---	2.42E-002
RU-106	Not Detected	---	2.35E-001
SB-122	Not Detected	---	1.24E-001
SB-124	Not Detected	---	2.41E-002
SB-125	Not Detected	---	5.99E-002
SN-113	Not Detected	---	3.09E-002
SR-85	Not Detected	---	2.92E-002
TA-182	Not Detected	---	1.35E-001
TA-183	Not Detected	---	2.80E-001
TC-99m	Not Detected	---	6.73E+004
TL-201	Not Detected	---	2.49E-001
XE-133	Not Detected	---	3.66E-001
Y-88	Not Detected	---	2.53E-002
ZN-65	Not Detected	---	8.84E-002
ZR-95	Not Detected	---	4.85E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/28/98 10:06:43 AM *
****
*
* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
****

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042936-001
Lab Sample ID : 80199214

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 1064.000 gram
Sample Date/Time : 9/22/98 11:10:00 AM
Acquire Start Date/Time : 9/28/98 8:26:29 AM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	1.02E+000	5.80E-001	4.00E-001
RA-226	1.39E+000	7.46E-001	4.43E-001
PB-214	4.64E-001	1.03E-001	4.15E-002
BI-214	4.15E-001	1.02E-001	4.00E-002
PB-210	Not Detected	---	6.33E+000
TH-232	6.14E-001	3.71E-001	1.26E-001
RA-228	7.01E-001	2.48E-001	1.37E-001
AC-228	6.31E-001	1.86E-001	7.06E-002
TH-228	7.14E-001	2.83E-001	3.74E-001
RA-224	8.51E-001	3.27E-001	6.55E-002
PB-212	6.59E-001	1.37E-001	1.04E-001
BI-212	8.36E-001	4.65E-001	2.78E-001
TL-208	6.18E-001	1.56E-001	6.16E-002
U-235	Not Detected	---	1.61E-001
TH-231	Not Detected	---	5.94E+000
PA-231	Not Detected	---	1.06E+000
TH-227	Not Detected	---	2.33E-001
RA-223	Not Detected	---	1.37E-001
RN-219	Not Detected	---	2.88E-001
PB-211	Not Detected	---	6.50E-001
TL-207	Not Detected	---	1.23E+001
AM-241	Not Detected	---	1.56E-001
PU-239	Not Detected	---	2.98E+002
NP-237	Not Detected	---	1.97E-001
PA-233	Not Detected	---	4.67E-002
TH-229	Not Detected	---	1.39E-001

[Summary Report] - Sample ID: : 80199214

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.37E-002
AG-110m	Not Detected	---	3.27E-002
BA-133	Not Detected	---	3.57E-002
BE-7	Not Detected	---	2.08E-001
CD-109	Not Detected	---	6.67E-001
CD-115	Not Detected	---	3.33E-001
CE-139	Not Detected	---	2.06E-002
CE-141	Not Detected	---	3.99E-002
CE-144	Not Detected	---	1.61E-001
CO-56	Not Detected	---	2.89E-002
CO-57	Not Detected	---	2.09E-002
CO-58	Not Detected	---	2.80E-002
CO-60	Not Detected	---	3.32E-002
CR-51	Not Detected	---	2.15E-001
CS-134	Not Detected	---	2.70E-002
CS-137	6.52E-002	3.03E-002	1.88E-002
EU-152	Not Detected	---	6.18E-002
EU-154	Not Detected	---	1.60E-001
EU-155	~~9.62E-002~~	~~7.73E-002~~	6.94E-002 Not detected
FE-59	Not Detected	---	6.75E-002
GD-153	Not Detected	---	5.70E-002
HG-203	Not Detected	---	2.50E-002
I-131	Not Detected	---	3.55E-002
IR-192	Not Detected	---	2.28E-002
K-40	1.96E+001	2.85E+000	3.71E-001
MN-52	Not Detected	---	5.99E-002
MN-54	Not Detected	---	3.07E-002
MO-99	Not Detected	---	8.63E-001
NA-22	Not Detected	---	4.05E-002
NA-24	Not Detected	---	1.93E+001
NB-95	Not Detected	---	2.57E-001
ND-147	Not Detected	---	2.35E-001
NI-57	Not Detected	---	6.88E-001
RU-103	Not Detected	---	2.50E-002
RU-106	Not Detected	---	2.30E-001
SB-122	Not Detected	---	1.46E-001
SB-124	Not Detected	---	2.36E-002
SB-125	Not Detected	---	6.10E-002
SN-113	Not Detected	---	2.95E-002
SR-85	Not Detected	---	3.13E-002
TA-182	Not Detected	---	1.44E-001
TA-183	Not Detected	---	2.96E-001
TC-99m	Not Detected	---	2.53E+005
TL-201	Not Detected	---	2.85E-001
XE-133	Not Detected	---	4.26E-001
Y-88	Not Detected	---	2.26E-002
ZN-65	Not Detected	---	9.46E-002
ZR-95	Not Detected	---	4.87E-002

9/28/98

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/28/98 10:16:02 AM *
****

* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042937-001
Lab Sample ID : 80199215

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 843.000 gram
Sample Date/Time : 9/22/98 11:15:00 AM
Acquire Start Date/Time : 9/28/98 8:35:49 AM
Detector Name : LAB04
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.47E-001
RA-226	1.12E+000	5.68E-001	4.81E-001
PB-214	5.20E-001	1.00E-001	3.76E-002
BI-214	4.81E-001	1.10E-001	3.41E-002
PB-210	Not Detected	---	7.98E+000
TH-232	7.45E-001	3.90E-001	1.17E-001
RA-228	6.99E-001	2.61E-001	1.15E-001
AC-228	7.54E-001	1.87E-001	6.83E-002
TH-228	5.62E-001	2.24E-001	3.49E-001
RA-224	8.45E-001	3.28E+000	6.09E-002
PB-212	6.92E-001	1.33E-001	3.24E-002
BI-212	7.41E-001	4.03E-001	2.36E-001
TL-208	6.27E-001	1.45E-001	5.30E-002
U-235	2.12E-002	1.47E-001	1.70E-001
TH-231	Not Detected	---	7.84E+000
PA-231	Not Detected	---	1.14E+000
TH-227	Not Detected	---	2.90E-001
RA-223	Not Detected	---	1.82E-001
RN-219	Not Detected	---	2.86E-001
PB-211	Not Detected	---	6.64E-001
TL-207	Not Detected	---	1.15E+001
AM-241	Not Detected	---	1.89E-001
PU-239	Not Detected	---	3.11E+002
NP-237	~~3.54E-001~~	~~1.94E-001~~	1.73E-001 Not detected
PA-233	Not Detected	---	4.72E-002
TH-229	Not Detected	---	1.76E-001

9/28/98

[Summary Report] - Sample ID: : 80199215

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.23E-002
AG-110m	Not Detected	---	3.54E-002
BA-133	Not Detected	---	5.08E-002
BE-7	Not Detected	---	2.18E-001
CD-109	Not Detected	---	5.90E-001
CD-115	Not Detected	---	3.32E-001
CE-139	Not Detected	---	2.29E-002
CE-141	Not Detected	---	4.20E-002
CE-144	Not Detected	---	1.68E-001
CO-56	Not Detected	---	2.62E-002
CO-57	Not Detected	---	2.19E-002
CO-58	Not Detected	---	2.64E-002
CO-60	Not Detected	---	2.78E-002
CR-51	Not Detected	---	2.21E-001
CS-134	Not Detected	---	3.77E-002
CS-137	1.46E-001	1.47E+000	2.11E-002
EU-152	Not Detected	---	6.50E-002
EU-154	Not Detected	---	1.49E-001
EU-155	Not Detected	---	1.01E-001
FE-59	Not Detected	---	6.61E-002
GD-153	Not Detected	---	7.46E-002
HG-203	Not Detected	---	2.75E-002
I-131	Not Detected	---	3.82E-002
IR-192	Not Detected	---	2.36E-002
K-40	2.11E+001	2.94E+000	1.72E-001
MN-52	Not Detected	---	4.98E-002
MN-54	Not Detected	---	1.19E-002
MO-99	Not Detected	---	8.69E-001
NA-22	Not Detected	---	3.64E-002
NA-24	Not Detected	---	1.72E+001
NB-95	Not Detected	---	4.13E-001
ND-147	Not Detected	---	2.36E-001
NI-57	Not Detected	---	5.96E-001
RU-103	Not Detected	---	2.55E-002
RU-106	Not Detected	---	2.27E-001
SB-122	~~4.25E-002~~	~~3.14E-002~~	7.05E-002
SB-124	Not Detected	---	2.49E-002
SB-125	Not Detected	---	6.75E-002
SN-113	Not Detected	---	3.09E-002
SR-85	Not Detected	---	3.13E-002
TA-182	Not Detected	---	1.29E-001
TA-183	Not Detected	---	3.60E-001
TC-99m	Not Detected	---	2.67E+005
TL-201	Not Detected	---	3.75E-001
XE-133	Not Detected	---	6.02E-001
Y-88	Not Detected	---	2.04E-002
ZN-65	Not Detected	---	8.74E-002
ZR-95	Not Detected	---	4.77E-002

not detected
9/28/98

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*
Sandia National Laboratories
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*
Radiation Protection Sample Diagnostics Program [806 Laboratory]
*
*
9/27/98 3:45:11 PM
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****
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*
* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
****

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042939-001
Lab Sample ID : 80199216

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 880.000 gram
Sample Date/Time : 9/22/98 11:20:00 AM
Acquire Start Date/Time : 9/27/98 2:04:57 PM
Detector Name : LAB04
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:
****

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	6.49E-001	4.37E-001	3.75E-001
RA-226	1.17E+000	6.31E-001	4.37E-001
PB-214	6.00E-001	1.13E-001	3.54E-002
BI-214	5.11E-001	1.10E-001	3.60E-002
PB-210	Not Detected	---	7.94E+000
TH-232	7.68E-001	4.08E-001	1.15E-001
RA-228	8.68E-001	2.53E-001	1.13E-001
AC-228	8.01E-001	2.27E-001	6.28E-002
TH-228	7.37E-001	2.52E-001	3.84E-001
RA-224	7.63E-001	2.37E-001	5.37E-002
PB-212	7.76E-001	1.44E-001	3.26E-002
BI-212	8.89E-001	4.60E-001	2.44E-001
TL-208	7.06E-001	1.14E-001	5.12E-002
U-235	Not Detected	---	1.66E-001
~~TH-231~~	~~2.53E+000~~	~~3.09E+000~~	7.98E+000 Not detected 9/28/98
PA-231	Not Detected	---	1.11E+000
TH-227	Not Detected	---	2.97E-001
RA-223	Not Detected	---	1.78E-001
RN-219	Not Detected	---	3.02E-001
PB-211	Not Detected	---	6.81E-001
TL-207	Not Detected	---	1.10E+001
AM-241	Not Detected	---	1.88E-001
PU-239	Not Detected	---	3.04E+002
NP-237	Not Detected	---	1.81E-001
PA-233	Not Detected	---	4.73E-002
TH-229	Not Detected	---	1.77E-001

[Summary Report] - Sample ID: : 80199216

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.30E-002
AG-110m	Not Detected	---------	2.65E-002
BA-133	Not Detected	---------	5.22E-002
BE-7	Not Detected	---------	2.04E-001
CD-109	~~1.85E+000~~	~~6.53E-001~~	6.18E-001
CD-115	Not Detected	---------	2.66E-001
CE-139	Not Detected	---------	2.30E-002
CE-141	Not Detected	---------	4.01E-002
CE-144	Not Detected	---------	1.67E-001
CO-56	Not Detected	---------	2.52E-002
CO-57	Not Detected	---------	2.19E-002
CO-58	Not Detected	---------	2.41E-002
CO-60	Not Detected	---------	2.91E-002
CR-51	Not Detected	---------	2.10E-001
CS-134	Not Detected	---------	3.86E-002
CS-137	3.41E-002	2.08E-002	1.57E-002
EU-152	Not Detected	---------	6.49E-002
EU-154	Not Detected	---------	1.53E-001
EU-155	Not Detected	---------	1.00E-001
FE-59	Not Detected	---------	6.06E-002
GD-153	Not Detected	---------	7.45E-002
HG-203	Not Detected	---------	2.58E-002
I-131	Not Detected	---------	3.44E-002
IR-192	Not Detected	---------	2.28E-002
K-40	1.87E+001	2.68E+000	1.82E-001
MN-52	Not Detected	---------	4.52E-002
MN-54	Not Detected	---------	1.62E-002
MO-99	Not Detected	---------	6.70E-001
NA-22	Not Detected	---------	3.16E-002
NA-24	Not Detected	---------	7.61E+000
NB-95	Not Detected	---------	3.64E-001
ND-147	Not Detected	---------	2.23E-001
NI-57	Not Detected	---------	4.18E-001
RU-103	Not Detected	---------	2.52E-002
RU-106	Not Detected	---------	2.14E-001
SB-122	Not Detected	---------	1.15E-001
SB-124	Not Detected	---------	2.45E-002
SB-125	Not Detected	---------	6.45E-002
SN-113	Not Detected	---------	2.99E-002
SR-85	Not Detected	---------	3.02E-002
TA-182	Not Detected	---------	1.26E-001
TA-183	Not Detected	---------	3.21E-001
TC-99m	Not Detected	---------	3.14E+004
TL-201	Not Detected	---------	3.18E-001
XE-133	Not Detected	---------	4.82E-001
Y-88	Not Detected	---------	1.96E-002
ZN-65	Not Detected	---------	8.44E-002
ZR-95	Not Detected	---------	4.91E-002

Not detected
9/28/98

```
*****************************************************************************
*                       Sandia National Laboratories                        *
*     Radiation Protection Sample Diagnostics Program [806 Laboratory]      *
*                         9/27/98  7:11:03 PM                               *
*****************************************************************************
*                                                                           *
* Analyzed by:                  9/28/98   Reviewed by:      9/30/98         *
*****************************************************************************
Customer                    : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID          : 042940-001
Lab Sample ID               : 80199217

Sample Description          : MARINELLI LIQUID SAMPLE
Sample Quantity             :   500.000  mL
Sample Date/Time            :  9/22/98  11:25:00 AM
Acquire Start Date/Time     :  9/27/98   5:30:53 PM
Detector Name               : LAB04
Elapsed Live/Real Time      :   6000 /   6001 seconds

Comments:
*****************************************************************************
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Nuclide Name	Activity (pCi/mL)	2-sigma Error	MDA (pCi/mL)
U-238	Not Detected	---------	2.63E-001
RA-226	Not Detected	---------	3.58E-001
PB-214	Not Detected	---------	3.61E-002
BI-214	Not Detected	---------	3.79E-002
PB-210	Not Detected	---------	3.37E+000
TH-232	Not Detected	---------	1.14E-001
RA-228	Not Detected	---------	7.68E-002
AC-228	Not Detected	---------	6.06E-002
TH-228	Not Detected	---------	3.84E-001
RA-224	Not Detected	---------	8.88E-002
PB-212	Not Detected	---------	3.01E-002
BI-212	Not Detected	---------	2.41E-001
TL-208	Not Detected	---------	4.93E-002
U-235	Not Detected	---------	1.05E-001
TH-231	Not Detected	---------	3.99E+000
PA-231	Not Detected	---------	7.67E-001
TH-227	Not Detected	---------	1.08E-001
RA-223	Not Detected	---------	8.72E-002
RN-219	Not Detected	---------	1.85E-001
PB-211	Not Detected	---------	4.13E-001
TL-207	Not Detected	---------	6.78E+000
AM-241	Not Detected	---------	8.77E-002
PU-239	Not Detected	---------	1.69E+002
NP-237	Not Detected	---------	1.17E-001
PA-233	Not Detected	---------	3.22E-002
TH-229	Not Detected	---------	9.91E-002

[Summary Report] - Sample ID: : 80199217

Nuclide Name	Activity (pCi/mL)	2-sigma Error	MDA (pCi/mL)
AG-108m	Not Detected	---------	1.60E-002
AG-110m	Not Detected	---------	1.55E-002
BA-133	Not Detected	---------	2.23E-002
BE-7	Not Detected	---------	1.45E-001
CD-109	Not Detected	---------	3.97E-001
CD-115	Not Detected	---------	1.42E-001
CE-139	Not Detected	---------	1.41E-002
CE-141	Not Detected	---------	2.48E-002
CE-144	Not Detected	---------	9.62E-002
CO-56	Not Detected	---------	1.83E-002
CO-57	Not Detected	---------	1.33E-002
CO-58	Not Detected	---------	1.67E-002
CO-60	Not Detected	---------	1.81E-002
CR-51	Not Detected	---------	1.46E-001
CS-134	Not Detected	---------	1.80E-002
CS-137	Not Detected	---------	1.47E-002
EU-152	Not Detected	---------	3.97E-002
EU-154	Not Detected	---------	7.30E-002
EU-155	Not Detected	---------	5.89E-002
FE-59	Not Detected	---------	3.28E-002
GD-153	Not Detected	---------	4.14E-002
HG-203	Not Detected	---------	1.66E-002
I-131	Not Detected	---------	2.39E-002
IR-192	Not Detected	---------	1.53E-002
K-40	Not Detected	---------	2.35E-001
MN-52	Not Detected	---------	3.46E-002
MN-54	Not Detected	---------	1.73E-002
MO-99	Not Detected	---------	4.79E-001
NA-22	Not Detected	---------	1.66E-002
NA-24	Not Detected	---------	6.68E+000
NB-95	Not Detected	---------	1.36E-001
ND-147	Not Detected	---------	1.46E-001
NI-57	Not Detected	---------	2.68E-001
RU-103	Not Detected	---------	1.83E-002
RU-106	Not Detected	---------	1.54E-001
SB-122	Not Detected	---------	7.72E-002
SB-124	Not Detected	---------	1.85E-002
SB-125	Not Detected	---------	3.68E-002
SN-113	Not Detected	---------	1.89E-002
SR-85	Not Detected	---------	2.48E-002
TA-182	Not Detected	---------	5.18E-002
TA-183	Not Detected	---------	1.53E-001
TC-99m	Not Detected	---------	2.91E+004
TL-201	Not Detected	---------	1.48E-001
XE-133	Not Detected	---------	2.34E-001
Y-88	Not Detected	---------	2.07E-002
ZN-65	Not Detected	---------	3.58E-002
ZR-95	Not Detected	---------	2.93E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/27/98 5:28:12 PM *
****

* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : 042941-001
Lab Sample ID : 80199218

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 941.000 gram
Sample Date/Time : 9/22/98 11:35:00 AM
Acquire Start Date/Time : 9/27/98 3:47:58 PM
Detector Name : LAB04
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	5.13E-001
RA-226	Not Detected	---	4.33E-001
PB-214	5.32E-001	1.09E-001	3.37E-002
BI-214	4.83E-001	1.06E-001	3.37E-002
PB-210	Not Detected	---	7.50E+000
TH-232	7.23E-001	4.09E-001	1.06E-001
RA-228	8.09E-001	2.59E-001	1.07E-001
AC-228	7.77E-001	1.87E-001	6.15E-002
TH-228	6.16E-001	2.29E-001	3.37E-001
RA-224	7.41E-001	2.82E-001	4.65E-002
PB-212	7.54E-001	1.40E-001	2.93E-002
BI-212	7.77E-001	4.09E-001	2.29E-001
TL-208	6.46E-001	1.51E-001	5.05E-002
U-235	Not Detected	---	1.28E-001
TH-231	Not Detected	---	7.67E+000
PA-231	Not Detected	---	1.07E+000
TH-227	Not Detected	---	2.82E-001
RA-223	Not Detected	---	1.68E-001
RN-219	Not Detected	---	2.82E-001
PB-211	Not Detected	---	6.50E-001
TL-207	Not Detected	---	1.09E+001
AM-241	Not Detected	---	1.79E-001
PU-239	Not Detected	---	2.97E+002
NP-237	~~4.98E-001~~	~~1.37E-001~~	1.76E-001 Not detected
PA-233	Not Detected	---	4.61E-002
TH-229	Not Detected	---	1.68E-001

9/28/98

[Summary Report] - Sample ID: : 80199218

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.16E-002
AG-110m	Not Detected	---	2.70E-002
BA-133	Not Detected	---	4.87E-002
BE-7	Not Detected	---	1.94E-001
CD-109	Not Detected	---	6.00E-001
CD-115	Not Detected	---	2.54E-001
CE-139	Not Detected	---	2.20E-002
CE-141	Not Detected	---	3.93E-002
CE-144	Not Detected	---	1.66E-001
CO-56	Not Detected	---	2.50E-002
CO-57	Not Detected	---	2.14E-002
CO-58	Not Detected	---	2.47E-002
CO-60	Not Detected	---	3.01E-002
CR-51	Not Detected	---	2.11E-001
CS-134	Not Detected	---	3.68E-002
CS-137	4.44E-002	2.62E-002	1.61E-002
EU-152	Not Detected	---	6.29E-002
EU-154	Not Detected	---	1.47E-001
EU-155	Not Detected	---	9.65E-002
FE-59	Not Detected	---	5.94E-002
GD-153	Not Detected	---	7.19E-002
HG-203	Not Detected	---	2.53E-002
I-131	Not Detected	---	3.35E-002
IR-192	Not Detected	---	2.25E-002
K-40	2.00E+001	2.86E+000	1.80E-001
MN-52	Not Detected	---	4.54E-002
MN-54	Not Detected	---	1.52E-002
MO-99	Not Detected	---	6.78E-001
NA-22	Not Detected	---	3.16E-002
NA-24	Not Detected	---	8.28E+000
NB-95	Not Detected	---	3.51E-001
ND-147	Not Detected	---	2.11E-001
NI-57	Not Detected	---	4.14E-001
RU-103	Not Detected	---	2.43E-002
RU-106	Not Detected	---	2.21E-001
SB-122	Not Detected	---	1.16E-001
SB-124	Not Detected	---	2.45E-002
SB-125	Not Detected	---	5.91E-002
SN-113	Not Detected	---	2.92E-002
SR-85	Not Detected	---	2.89E-002
TA-182	Not Detected	---	1.20E-001
TA-183	Not Detected	---	3.09E-001
TC-99m	Not Detected	---	3.55E+004
TL-201	Not Detected	---	3.06E-001
XE-133	Not Detected	---	4.70E-001
Y-88	Not Detected	---	1.82E-002
ZN-65	Not Detected	---	8.12E-002
ZR-95	Not Detected	---	4.50E-002

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/28/98 10:49:42 AM *
****
*
* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
****

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 80199219

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 9/28/98 10:39:29 AM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	2.80E+003
RA-226	Not Detected	---	5.38E+003
PB-214	Not Detected	---	7.21E+002
BI-214	Not Detected	---	6.80E+002
PB-210	Not Detected	---	6.96E+004
TH-232	Not Detected	---	2.22E+003
RA-228	Not Detected	---	2.96E+003
AC-228	Not Detected	---	1.80E+003
TH-228	Not Detected	---	1.14E+005
RA-224	Not Detected	---	7.06E+003
PB-212	Not Detected	---	8.11E+003
BI-212	Not Detected	---	8.60E+004
TL-208	Not Detected	---	1.66E+004
U-235	Not Detected	---	1.42E+003
TH-231	Not Detected	---	4.37E+004
PA-231	Not Detected	---	1.38E+004
TH-227	Not Detected	---	2.30E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	6.03E+003
PB-211	Not Detected	---	1.37E+004
TL-207	Not Detected	---	2.56E+005
AM-241	Not Detected	---	1.41E+003
PU-239	Not Detected	---	2.40E+006
NP-237	Not Detected	---	1.35E+003
PA-233	Not Detected	---	6.31E+002
TH-229	Not Detected	---	1.11E+003

[Summary Report] - Sample ID: : 80199219

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.68E+002
AG-110m	Not Detected	---------	5.64E+006
BA-133	Not Detected	---------	7.47E+002
BE-7	Not Detected	---------	7.44E+019
CD-109	Not Detected	---------	2.91E+005
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	3.92E+008
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	1.58E+006
CO-56	Not Detected	---------	7.86E+013
CO-57	Not Detected	---------	2.86E+005
CO-58	Not Detected	---------	7.36E+014
CO-60	Not Detected	---------	5.37E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	4.47E+003
CS-137	Not Detected	---------	3.23E+002
EU-152	Not Detected	---------	8.19E+002
EU-154	Not Detected	---------	3.05E+003
EU-155	Not Detected	---------	2.46E+003
FE-59	Not Detected	---------	3.27E+022
GD-153	Not Detected	---------	1.84E+006
HG-203	Not Detected	---------	1.24E+021
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	1.74E+014
K-40	Not Detected	---------	1.47E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	2.52E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	1.98E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	7.53E+005
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	8.46E+016
SB-125	Not Detected	---------	8.33E+003
SN-113	Not Detected	---------	1.63E+010
SR-85	Not Detected	---------	9.92E+015
TA-182	Not Detected	---------	4.65E+010
TA-183	Not Detected	---------	1.00E+026
TC-99m	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	2.27E+010
ZN-65	Not Detected	---------	3.70E+006
ZR-95	Not Detected	---------	2.35E+016

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*
Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
Quality Assurance Report
*
****

Report Date : 9/28/98 10:49:44 AM
QA File : C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst : FCD
Sample ID : 80199219
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 9/28/98 10:39:29 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 ACTIVITY	8.616E-002	2.115E-003	8.098E-002	<	:In	:	>
CS-137 Activity	6.826E-002	1.011E-003	6.914E-002	<	:	:	>
CO-60 Activity	7.560E-002	2.698E-003	7.681E-002	<	:	:	>

OK 9/28/98

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 9/28/98

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program [806 Laboratory] *
* 9/28/98 11:09:37 AM *
****
*
* Analyzed by: 9/28/98 Reviewed by: 9/30/98 *
****

Customer : M.YOUNG/C.CAMPBELL (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 80199220

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 9/28/98 10:59:23 AM
Detector Name : LAB04
Elapsed Live/Real Time : 600 / 606 seconds

Comments:
****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	3.21E+003
RA-226	Not Detected	---------	5.21E+003
PB-214	Not Detected	---------	6.38E+002
BI-214	Not Detected	---------	5.53E+002
PB-210	Not Detected	---------	8.28E+004
TH-232	Not Detected	---------	2.02E+003
RA-228	Not Detected	---------	2.43E+003
AC-228	Not Detected	---------	1.42E+003
TH-228	Not Detected	---------	1.06E+005
RA-224	Not Detected	---------	3.47E+003
PB-212	Not Detected	---------	7.82E+003
BI-212	Not Detected	---------	6.87E+004
TL-208	Not Detected	---------	1.51E+004
U-235	Not Detected	---------	1.36E+003
TH-231	Not Detected	---------	5.23E+004
PA-231	Not Detected	---------	1.28E+004
TH-227	Not Detected	---------	2.21E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	5.40E+003
PB-211	Not Detected	---------	1.23E+004
TL-207	Not Detected	---------	1.98E+005
AM-241	Not Detected	---------	1.41E+003
PU-239	Not Detected	---------	2.29E+006
NP-237	Not Detected	---------	1.61E+003
PA-233	Not Detected	---------	5.64E+002
TH-229	Not Detected	---------	1.34E+003

[Summary Report] - Sample ID: : 80199220

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	2.97E+002
AG-110m	Not Detected	---------	4.77E+006
BA-133	Not Detected	---------	6.81E+002
BE-7	Not Detected	---------	6.15E+019
CD-109	Not Detected	---------	2.24E+005
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	3.88E+008
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	1.49E+006
CO-56	Not Detected	---------	6.24E+013
CO-57	Not Detected	---------	2.71E+005
CO-58	Not Detected	---------	5.44E+014
CO-60	Not Detected	---------	3.94E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	3.76E+003
CS-137	Not Detected	---------	2.44E+002
EU-152	Not Detected	---------	7.73E+002
EU-154	Not Detected	---------	2.47E+003
EU-155	Not Detected	---------	2.41E+003
FE-59	Not Detected	---------	2.53E+022
GD-153	Not Detected	---------	2.10E+006
HG-203	Not Detected	---------	1.18E+021
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	1.60E+014
K-40	Not Detected	---------	1.37E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	1.93E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	1.63E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	6.09E+005
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	7.33E+016
SB-125	Not Detected	---------	7.61E+003
SN-113	Not Detected	---------	1.46E+010
SR-85	Not Detected	---------	8.74E+015
TA-182	Not Detected	---------	3.76E+010
TA-183	Not Detected	---------	1.00E+026
TC-99m	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	2.29E+010
ZN-65	Not Detected	---------	2.86E+006
ZR-95	Not Detected	---------	1.83E+016

****
* Sandia National Laboratories *
* Radiation Protection Sample Diagnostics Program *
* Quality Assurance Report *
****

Report Date : 9/28/98 11:09:39 AM
QA File : C:\GENIE2K\CAMFILES\LCS4.QAF
Analyst : FCD
Sample ID : 80199220
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 9/28/98 10:59:23 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	SD	UD	BS >
AM-241 Activity	8.741E-002	1.351E-003	8.779E-002	<	:	:	: >
CS-137 Activity	7.122E-002	1.695E-003	7.199E-002	<	:	:	: >
CO-60 Activity	7.972E-002	1.943E-003	7.976E-002	<	:	:	: >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 9/28/98

Internal Lab

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Batch No. 900130 SAR/WR No.

AR/COC 601311

Dept. No./Mail Stop:	6134/1148	Date Sample Shipped:	SMO Use	Contract No.:	~~AJ-2480A~~ NA
Project/Task Manager:	~~Site 8/58~~ Caroline Byrd	Carrier/Waybill No:		Case No.:	7213.220600
Project Name:	Foothill Test Area - Site 58	Lab Contact:	~~Edie Kent~~ Fernando D.	SMO Authorization:	
Record Center Code:	ER/1333/58/DAT	Lab Destination:	~~GEL~~ AMEL	Bill To: Sandia National Laboratories	
Logbook Ref. No.:		SMO Contact/Phone:	Doug Salmi/848-0963	Supplier Services Dept.:	
Service Order No.	CF00655	Send Report to SMO:	Robert Rivera	P.O. Box 5800 MS 0154	
Location	NA				

COPY

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth/ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Use Lab Sample ID
044107-004	S58UP1-GR-001-0-SS	0	58	11899/1040	s	M	500m	none	G	SA	Gamma Spec	
044108-004	S58UP2-GR-001-0-SS	0	58	11899/1100	s	M	500m	none	G	SA	Gamma Spec	
044109-004	S58WP-GR-001-0-SS	0	58	11899/1130	s	M	500m	none	G	SA	Gamma Spec	
044110-004	S8YV-GR-001-0-SS	0	58	11999/1500	s	M	500m	none	G	SA	Gamma Spec	
044111-004	S8YV-GR-002-0-SS	0	58	11999/1510	s	M	500m	none	G	SA	Gamma Spec	
044112-004	S8YV-GR-003-0-SS	0	58	11999/1525	s	M	500m	none	G	SA	Gamma Spec	
044113-004	S8YV-GR-004-0-SS	0	58	11999/1537	s	M	500m	none	G	SA	Gamma Spec	
044114-004	S8YV-GR-005-0-SS	0	58	11999/1549	s	M	500m	none	G	SA	Gamma Spec	
044115-004	S8YV-GR-006-0-SS	0	58	11999/1601	s	M	500m	none	G	SA	Gamma Spec	
044196-004	S8YV-GR-101-0-SD	0	58	11999/1537	s	M	500m	none	G	SA	Gamma Spec	

RMMA ☒ Yes ☐ No Ref. No.

Sample Disposal ☒ Return to Client ☒ Disposal by lab

Turnaround Time ☐ Normal ☒ Rush

Required Report Date

Special Instructions/QC Requirements

EDD ☐ Yes ☒ No

Raw Data Package ☐ Yes ☒ No

This CoC releases CoC 601310 and 601331.

Please list as separate report.

Sample Team Members	Name	Signature	Init	Company/Organization/Phone
	Chris Catechis	Ch. Catechis	CC	MDM/6131/235-3841
	Bill Gibson	William J. Gibson Jr	WJG	MDM/6131/235-3841

1.Relinquished by	William J. Gibson Jr	Org. 6131	Date 1-20-99	Time 13:08	4.Relinquished by	Org.	Date Time
1. Received by	Robert Rivera (SMO)	Org. 7578	Date 1-20-99	Time 1308	4. Received by	Org.	Date Time
2.Relinquished by	Robert Rivera (SMO)	Org. 7578	Date 1-20-99	Time 1540	5.Relinquished by	Org.	Date Time
2. Received by		Org. SM 7578	Date 1-20-99	Time 1540	5. Received by	Org.	Date Time
3.Relinquished by		Org. [illegible]	Date 1/[illegible]	Time 741	6.Relinquished by	Org.	Date Time
3. Received by	[illegible]	Org. 7572	Date 1/22/99	Time 0741	6. Received by	Org.	Date Time

Survey Number: S15672

RADIOLOGICAL SURVEY FORM

Location ER site 58	Requester/Org. Ed Mignardot \ 6134	Date 1/19/99	Time 1700	Duration 1.0
Purpose Samples		Request # N\A	RWP # 0309	RPIR # N\A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1 \ HP 260 \ 2883	N\A	Arthur L Tucker	
N\A	N\A	N\A	N\A
N\A	N\A	N\A	N\A

#	Item Description/Location	BETA-GAMMA ACTIVITY Counting Data Attached ☒Yes ☐No % Eff. 0.2 /Radionuclide N\A				ALPHA ACTIVITY Counting Data Attached ☒Yes ☐No % Eff. N\A /Radionuclide N\A				RADIATION SURVEY Bkg. N\A	
		cpm	Bkg. cpm	dpm / 100 cm² [1]	T/R/F [2]	cpm	Bkg. cpm	dpm / 100 cm² [1]	T/R/F [2]	mrem/hr [3]	Distance
1	Sample #441321	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
2	Sample #44135	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
3	Sample #44130	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
4	Sample #44125	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
5	Sample #44131	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
6	Sample #44128	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
7	Sample #44129	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
8	Sample #44127	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
9	Sample #44126	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
10	Sample #44136	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
11	Sample #44133	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A

[1] If area other than 100 cm², record as dpm/probe, or dpm/I.A.W. [2] Total/Removable/Fixed [3] Indicate type, if other than gamma (i.e., n, α, or β).

Remarks: NCD = No Contamination Detected

COPY

	Reviewed by:	Date:

Survey Number: S15672

RADIOLOGICAL SURVEY FORM CONTINUATION

#	Item Description/Location	BETA-GAMMA ACTIVITY				ALPHA ACTIVITY				RADIATION SURVEY	
		cpm	Bkg. cpm	dpm / 100 cm² (1)	T/R/F(2)	cpm	Bkg. cpm	dpm / 100 cm² (1)	T/R/F(2)	mrem/hr (3)	Distance
12	Sample #44115	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
13	Sample #44114	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
14	Sample #44196	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
15	Sample #44110	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
16	Sample #44111	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
17	Sample #44112	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
18	Sample #44113	60	60	NCD	T	N\A	N\A	N\A	R	N\A	N\A
					N\A						

(1) If area other than 100 cm², record as dpm/probe, or dpm/LAW. (2) Total/Removable/Fixed. (3) Indicate type, if other than gamma (i.e., n, α, or β).

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Sandia National Laboratories
Radiation Protection Sample Diagnostics

Sample Analysis Request Form
Page 1 of 1

To be completed by Customer

Shaded areas are for RPSD use only

Customer: Caroline Byrd
Organization: 6134/1148
Project Location: Site 8/SD
Phone: 845-0868
Date Results Needed: 1-21-99
Suspect Isotopes: U NK
Other Information: 72 M, 2206

Hazards/Special Instructions: C.o.C 601311

Batch Log Number: 900130
Logged By: TM

Analysis Type:
- [x] Gamma Spec
- [ ] H-3
- [ ] Alpha/Beta
- [ ] Alpha Spec
- [ ] Total U
- [ ] Other

LIMS Login
Results Faxed
Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
044107 - 004	Soil	11899/1040	500 ml	Gamma Spec	01	< 300	776 g	
044108 - 004		11899/1100			02		784 g	
044109 - 004		11899/1130			03		832 g	
044110 - 004		11999/1500			04		857 g	
044111 - 004		11999/1510			05		930 g	
044112 - 004		11999/1525			06		780 g	
044113 - 004		11999/1537			07		949 g	
044114 - 004		11999/1549			08		884 g	
044115 - 004		11999/1601			09		590 g	
044116 - 004		11999/1537			10	< 300	895 g	
LCS	—	1100990	—	Gamma Spec	11	NA	NA	

Relinquished by [signature] Date 1/20/99 Time 1545 Received by [signature] Date 1/20/99 Time 1545
Relinquished by [signature] Date 1/22/99 Time 0741 Received by [signature] Date 1/22/99 Time 0741

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/21/99 9:13:07 AM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044107-004
Lab Sample ID : 90013001

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 776.000 gram
Sample Date/Time : 1/18/99 10:40:00 AM
Acquire Start Date/Time : 1/20/99 5:08:00 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	5.36E-001
RA-226	1.42E+000	8.61E-001	5.53E-001
PB-214	6.41E-001	1.44E-001	6.31E-002
BI-214	5.74E-001	4.68E-001	4.99E-002
PB-210	Not Detected	---------	7.88E+000
TH-232	8.78E-001	4.65E-001	1.30E-001
RA-228	9.10E-001	3.44E-001	1.68E-001
AC-228	8.03E-001	2.38E-001	8.88E-002
TH-228	7.63E-001	2.56E-001	4.71E-001
RA-224	9.81E-001	6.94E-001	8.54E-002
PB-212	8.52E-001	2.60E-001	4.20E-002
BI-212	8.57E-001	5.77E-001	3.20E-001
TL-208	6.98E-001	1.80E-001	7.65E-002
U-235	Not Detected	---------	1.97E-001
TH-231	Not Detected	---------	7.23E+000
PA-231	Not Detected	---------	1.26E+000
TH-227	Not Detected	---------	3.07E-001
RA-223	Not Detected	---------	1.38E-001
RN-219	Not Detected	---------	3.70E-001
PB-211	Not Detected	---------	8.14E-001
TL-207	Not Detected	---------	1.49E+001
AM-241	Not Detected	---------	1.95E-001
PU-239	Not Detected	---------	3.62E+002
NP-237	Not Detected	---------	2.55E-001
PA-233	Not Detected	---------	5.66E-002
TH-229	Not Detected	---------	1.67E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013001

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.00E-002
AG-110m	Not Detected	---------	5.55E-002
BA-133	Not Detected	---------	4.69E-002
BE-7	Not Detected	---------	2.55E-001
CD-109	Not Detected	---------	8.27E-001
CD-115	Not Detected	---------	1.37E-001
CE-139	Not Detected	---------	2.52E-002
CE-141	Not Detected	---------	4.58E-002
CE-144	Not Detected	---------	1.89E-001
CO-56	Not Detected	---------	3.51E-002
CO-57	Not Detected	---------	2.46E-002
CO-58	Not Detected	---------	3.45E-002
CO-60	Not Detected	---------	3.94E-002
CR-51	Not Detected	---------	2.36E-001
CS-134	Not Detected	---------	3.19E-002
CS-137	2.71E-001	2.11E-001	2.42E-002
EU-152	Not Detected	---------	7.30E-002
EU-154	Not Detected	---------	1.93E-001
EU-155	Not Detected	---------	1.14E-001
FE-59	Not Detected	---------	8.18E-002
GD-153	Not Detected	---------	6.67E-002
HG-203	Not Detected	---------	3.04E-002
I-131	Not Detected	---------	3.59E-002
IR-192	Not Detected	---------	2.62E-002
K-40	1.70E+001	2.64E+000	6.29E-001
MN-52	Not Detected	---------	4.39E-002
MN-54	Not Detected	---------	3.66E-002
MO-99	Not Detected	---------	4.25E-001
NA-22	Not Detected	---------	4.53E-002
NA-24	Not Detected	---------	4.34E-001
NB-95	Not Detected	---------	1.68E-001
ND-147	Not Detected	---------	2.34E-001
NI-57	Not Detected	---------	1.76E-001
RU-103	Not Detected	---------	2.81E-002
RU-106	Not Detected	---------	2.92E-001
SB-122	Not Detected	---------	7.07E-002
SB-124	Not Detected	---------	2.71E-002
SB-125	Not Detected	---------	8.14E-002
SN-113	Not Detected	---------	3.87E-002
SR-85	Not Detected	---------	3.60E-002
TA-182	Not Detected	---------	1.66E-001
TA-183	Not Detected	---------	2.27E-001
TC-99m	Not Detected	---------	1.33E+001
TL-201	Not Detected	---------	1.54E-001
XE-133	Not Detected	---------	1.66E-001
Y-88	Not Detected	---------	2.87E-002
ZN-65	Not Detected	---------	1.08E-001
ZR-95	Not Detected	---------	5.82E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/20/99 8:30:17 PM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044108-004
Lab Sample ID : 90013002

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 784.000 gram
Sample Date/Time : 1/18/99 11:00:00 AM
Acquire Start Date/Time : 1/20/99 6:50:03 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	5.41E-001
RA-226	1.47E+000	1.10E+000	5.42E-001
PB-214	6.54E-001	1.50E-001	6.37E-002
BI-214	6.14E-001	1.34E-001	4.80E-002
PB-210	Not Detected	---------	4.51E+000
TH-232	9.40E-001	4.70E-001	1.65E-001
RA-228	8.01E-001	3.06E-001	1.71E-001
AC-228	8.60E-001	2.23E-001	9.14E-002
TH-228	1.12E+000	6.58E-001	4.49E-001
RA-224	9.95E-001	3.80E-001	8.64E-002
PB-212	9.13E-001	4.98E-001	4.23E-002
BI-212	9.69E-001	6.05E-001	3.38E-001
TL-208	7.83E-001	5.42E-001	6.95E-002
U-235	Not Detected	---------	2.03E-001
TH-231	Not Detected	---------	7.25E+000
PA-231	Not Detected	---------	1.34E+000
TH-227	Not Detected	---------	3.08E-001
RA-223	Not Detected	---------	1.39E-001
RN-219	Not Detected	---------	3.70E-001
PB-211	Not Detected	---------	8.52E-001
TL-207	Not Detected	---------	1.44E+001
AM-241	Not Detected	---------	1.98E-001
PU-239	Not Detected	---------	3.72E+002
NP-237	~~5.54E-001~~	~~2.66E-001~~	2.06E-001
PA-233	Not Detected	---------	5.66E-002
TH-229	Not Detected	---------	1.76E-001

Not detected
1/21/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013002

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.08E-002
AG-110m	Not Detected	---------	5.20E-002
BA-133	Not Detected	---------	4.70E-002
BE-7	Not Detected	---------	2.72E-001
CD-109	Not Detected	---------	8.41E-001
CD-115	Not Detected	---------	1.48E-001
CE-139	Not Detected	---------	2.56E-002
CE-141	Not Detected	---------	4.64E-002
CE-144	Not Detected	---------	1.97E-001
CO-56	Not Detected	---------	3.59E-002
CO-57	Not Detected	---------	2.45E-002
CO-58	Not Detected	---------	3.58E-002
CO-60	Not Detected	---------	3.93E-002
CR-51	Not Detected	---------	2.39E-001
CS-134	Not Detected	---------	3.41E-002
CS-137	2.24E-001	6.46E-002	2.63E-002
EU-152	Not Detected	---------	7.41E-002
EU-154	Not Detected	---------	2.01E-001
EU-155	Not Detected	---------	1.19E-001
FE-59	Not Detected	---------	8.26E-002
GD-153	Not Detected	---------	6.82E-002
HG-203	Not Detected	---------	3.12E-002
I-131	Not Detected	---------	3.56E-002
IR-192	Not Detected	---------	2.79E-002
K-40	1.79E+001	2.72E+000	6.08E-001
MN-52	Not Detected	---------	4.65E-002
MN-54	Not Detected	---------	1.97E-002
MO-99	Not Detected	---------	4.35E-001
NA-22	Not Detected	---------	4.61E-002
NA-24	Not Detected	---------	4.52E-001
NB-95	Not Detected	---------	1.69E-001
ND-147	Not Detected	---------	2.26E-001
NI-57	Not Detected	---------	1.65E-001
RU-103	Not Detected	---------	3.04E-002
RU-106	Not Detected	---------	3.01E-001
SB-122	Not Detected	---------	7.59E-002
SB-124	Not Detected	---------	2.99E-002
SB-125	Not Detected	---------	7.82E-002
SN-113	Not Detected	---------	3.86E-002
SR-85	Not Detected	---------	3.72E-002
TA-182	Not Detected	---------	1.66E-001
TA-183	Not Detected	---------	2.32E-001
TC-99m	Not Detected	---------	1.61E+001
TL-201	Not Detected	---------	1.57E-001
XE-133	Not Detected	---------	1.71E-001
Y-88	Not Detected	---------	2.89E-002
ZN-65	Not Detected	---------	1.12E-001
ZR-95	Not Detected	---------	5.90E-002

Sandia National Laboratories

Radiation Protection Sample Diagnostics Program [806 Laboratory]

1/20/99 10:12:20 PM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044109-004
Lab Sample ID : 90013003

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 832.000 gram
Sample Date/Time : 1/18/99 11:30:00 AM
Acquire Start Date/Time : 1/20/99 8:32:06 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---	4.88E-001
RA-226	1.71E+000	8.89E-001	5.23E-001
PB-214	6.61E-001	1.45E-001	6.36E-002
BI-214	6.50E-001	6.67E-001	5.12E-002
PB-210	Not Detected	---	7.90E+000
TH-232	1.04E+000	5.32E-001	1.46E-001
RA-228	7.88E-001	3.30E-001	1.63E-001
AC-228	9.32E-001	2.56E-001	9.68E-002
TH-228	1.03E+000	3.38E-001	4.66E-001
RA-224	1.00E+000	3.82E-001	8.86E-002
PB-212	9.32E-001	1.69E-001	3.99E-002
BI-212	9.34E-001	5.24E-001	3.35E-001
TL-208	9.13E-001	3.99E-001	6.83E-002
U-235	1.56E-001	1.74E-001	2.03E-001
TH-231	Not Detected	---	7.30E+000
PA-231	Not Detected	---	1.27E+000
TH-227	Not Detected	---	3.02E-001
RA-223	Not Detected	---	1.38E-001
RN-219	Not Detected	---	3.65E-001
PB-211	Not Detected	---	7.95E-001
TL-207	Not Detected	---	1.39E+001
AM-241	Not Detected	---	1.97E-001
PU-239	Not Detected	---	3.60E+002
NP-237	Not Detected	---	2.46E-001
PA-233	Not Detected	---	5.67E-002
TH-229	Not Detected	---	1.71E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013003

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	4.04E-002
AG-110m	Not Detected	---------	4.43E-002
BA-133	Not Detected	---------	4.55E-002
BE-7	Not Detected	---------	2.44E-001
CD-109	Not Detected	---------	8.36E-001
CD-115	Not Detected	---------	1.47E-001
CE-139	Not Detected	---------	2.51E-002
CE-141	Not Detected	---------	4.57E-002
CE-144	Not Detected	---------	2.00E-001
CO-56	Not Detected	---------	3.65E-002
CO-57	Not Detected	---------	2.51E-002
CO-58	Not Detected	---------	3.35E-002
CO-60	Not Detected	---------	4.24E-002
CR-51	Not Detected	---------	2.28E-001
CS-134	Not Detected	---------	3.48E-002
CS-137	1.47E-001	5.15E-002	2.47E-002
EU-152	Not Detected	---------	7.56E-002
EU-154	Not Detected	---------	1.92E-001
EU-155	Not Detected	---------	1.13E-001
FE-59	Not Detected	---------	7.91E-002
GD-153	Not Detected	---------	6.48E-002
HG-203	Not Detected	---------	3.01E-002
I-131	Not Detected	---------	3.42E-002
IR-192	Not Detected	---------	2.67E-002
K-40	1.84E+001	2.80E+000	5.81E-001
MN-52	Not Detected	---------	4.76E-002
MN-54	Not Detected	---------	3.70E-002
MO-99	Not Detected	---------	4.27E-001
NA-22	Not Detected	---------	4.44E-002
NA-24	Not Detected	---------	5.21E-001
NB-95	~~6.43E-002~~	~~3.57E-002~~	1.02E-001 Not detected
ND-147	Not Detected	---------	2.40E-001
NI-57	Not Detected	---------	1.68E-001
RU-103	Not Detected	---------	2.80E-002
RU-106	Not Detected	---------	2.93E-001
SB-122	Not Detected	---------	7.16E-002
SB-124	Not Detected	---------	3.04E-002
SB-125	Not Detected	---------	7.80E-002
SN-113	Not Detected	---------	3.62E-002
SR-85	Not Detected	---------	3.78E-002
TA-182	Not Detected	---------	1.72E-001
TA-183	Not Detected	---------	2.32E-001
TC-99m	Not Detected	---------	1.85E+001
TL-201	Not Detected	---------	1.60E-001
XE-133	Not Detected	---------	1.73E-001
Y-88	Not Detected	---------	3.39E-002
ZN-65	Not Detected	---------	1.15E-001
ZR-95	Not Detected	---------	5.98E-002

1/21/99

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/20/99 11:54:23 PM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044110-004
Lab Sample ID : 90013004

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 857.000 gram
Sample Date/Time : 1/19/99 3:00:00 PM
Acquire Start Date/Time : 1/20/99 10:14:09 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	4.52E-001
RA-226	1.30E+000	8.61E-001	5.43E-001
PB-214	5.04E-001	1.15E-001	5.88E-002
BI-214	4.98E-001	1.19E-001	4.43E-002
PB-210	Not Detected	---------	7.50E+000
TH-232	6.37E-001	3.79E-001	1.54E-001
RA-228	6.42E-001	2.88E-001	1.82E-001
AC-228	7.05E-001	2.13E-001	8.28E-002
TH-228	6.63E-001	2.57E-001	4.12E-001
RA-224	8.16E-001	3.56E-001	1.00E-001
PB-212	6.84E-001	1.82E-001	3.91E-002
BI-212	7.11E-001	3.96E-001	3.22E-001
TL-208	6.15E-001	1.61E-001	6.81E-002
U-235	Not Detected	---------	1.84E-001
TH-231	Not Detected	---------	6.69E+000
PA-231	Not Detected	---------	1.24E+000
TH-227	Not Detected	---------	2.70E-001
RA-223	Not Detected	---------	1.19E-001
RN-219	Not Detected	---------	3.51E-001
PB-211	Not Detected	---------	7.99E-001
TL-207	Not Detected	---------	1.45E+001
AM-241	Not Detected	---------	1.76E-001
PU-239	Not Detected	---------	3.45E+002
NP-237	Not Detected	---------	2.29E-001
PA-233	Not Detected	---------	5.69E-002
TH-229	Not Detected	---------	1.56E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013004

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.70E-002
AG-110m	Not Detected	---------	5.38E-002
BA-133	Not Detected	---------	4.22E-002
BE-7	Not Detected	---------	2.49E-001
CD-109	Not Detected	---------	7.65E-001
CD-115	Not Detected	---------	9.37E-002
CE-139	Not Detected	---------	2.31E-002
CE-141	Not Detected	---------	4.17E-002
CE-144	Not Detected	---------	1.80E-001
CO-56	Not Detected	---------	3.41E-002
CO-57	Not Detected	---------	2.18E-002
CO-58	Not Detected	---------	3.22E-002
CO-60	Not Detected	---------	4.06E-002
CR-51	Not Detected	---------	2.24E-001
CS-134	Not Detected	---------	3.10E-002
CS-137	2.76E-001	2.86E-001	2.35E-002
EU-152	Not Detected	---------	6.55E-002
EU-154	Not Detected	---------	1.77E-001
EU-155	Not Detected	---------	1.08E-001
FE-59	Not Detected	---------	8.12E-002
GD-153	Not Detected	---------	6.09E-002
HG-203	Not Detected	---------	2.87E-002
I-131	Not Detected	---------	2.89E-002
IR-192	Not Detected	---------	2.64E-002
K-40	2.23E+001	3.36E+000	5.51E-001
MN-52	Not Detected	---------	3.82E-002
MN-54	Not Detected	---------	3.76E-002
MO-99	Not Detected	---------	3.09E-001
NA-22	Not Detected	---------	4.73E-002
NA-24	Not Detected	---------	1.53E-001
NB-95	Not Detected	---------	1.26E-001
ND-147	Not Detected	---------	1.96E-001
NI-57	Not Detected	---------	8.79E-002
RU-103	Not Detected	---------	2.70E-002
RU-106	Not Detected	---------	2.89E-001
SB-122	Not Detected	---------	5.20E-002
SB-124	Not Detected	---------	2.72E-002
SB-125	Not Detected	---------	7.27E-002
SN-113	Not Detected	---------	3.52E-002
SR-85	Not Detected	---------	3.32E-002
TA-182	Not Detected	---------	1.62E-001
TA-183	Not Detected	---------	1.79E-001
TC-99m	Not Detected	---------	8.64E-001
TL-201	Not Detected	---------	1.10E-001
XE-133	Not Detected	---------	1.13E-001
Y-88	Not Detected	---------	2.80E-002
ZN-65	Not Detected	---------	1.09E-001
ZR-95	Not Detected	---------	5.45E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/21/99 9:23:35 AM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044111-004
Lab Sample ID : 90013005

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 930.000 gram
Sample Date/Time : 1/19/99 3:10:00 PM
Acquire Start Date/Time : 1/20/99 11:56:11 PM
Detector Name : LAB01
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	2.51E-001	3.06E-001	4.19E-001
RA-226	1.33E+000	7.66E-001	5.29E-001
PB-214	4.68E-001	1.13E-001	5.61E-002
BI-214	4.25E-001	1.14E-001	4.47E-002
PB-210	Not Detected	---	6.98E+000
TH-232	7.12E-001	3.96E-001	1.36E-001
RA-228	6.97E-001	3.07E-001	1.49E-001
AC-228	6.54E-001	2.09E-001	8.49E-002
TH-228	6.68E-001	4.73E-001	4.01E-001
RA-224	7.51E-001	2.78E-001	8.63E-002
PB-212	7.02E-001	1.38E-001	3.63E-002
BI-212	9.84E-001	5.02E-001	2.67E-001
TL-208	5.88E-001	3.92E-001	5.46E-002
U-235	Not Detected	---	1.77E-001
TH-231	Not Detected	---	6.32E+000
PA-231	Not Detected	---	1.20E+000
TH-227	Not Detected	---	2.60E-001
RA-223	Not Detected	---	1.13E-001
RN-219	Not Detected	---	3.18E-001
PB-211	Not Detected	---	7.07E-001
TL-207	Not Detected	---	1.37E+001
AM-241	Not Detected	---	1.75E-001
PU-239	Not Detected	---	3.20E+002
NP-237	~~4.37E-001~~	~~1.54E-001~~	1.74E-001 Not detected 1/21/99
PA-233	Not Detected	---	4.99E-002
TH-229	Not Detected	---	1.51E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013005

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.53E-002
AG-110m	Not Detected	---------	3.93E-002
BA-133	Not Detected	---------	4.12E-002
BE-7	Not Detected	---------	2.22E-001
CD-109	Not Detected	---------	7.14E-001
CD-115	Not Detected	---------	9.06E-002
CE-139	Not Detected	---------	2.20E-002
CE-141	Not Detected	---------	3.98E-002
CE-144	Not Detected	---------	1.72E-001
CO-56	Not Detected	---------	3.35E-002
CO-57	Not Detected	---------	2.14E-002
CO-58	Not Detected	---------	3.23E-002
CO-60	Not Detected	---------	3.97E-002
CR-51	Not Detected	---------	2.07E-001
CS-134	Not Detected	---------	2.90E-002
CS-137	1.11E-001	4.24E-002	2.22E-002
EU-152	Not Detected	---------	6.48E-002
EU-154	Not Detected	---------	1.70E-001
EU-155	Not Detected	---------	1.02E-001
FE-59	Not Detected	---------	8.27E-002
GD-153	Not Detected	---------	6.11E-002
HG-203	Not Detected	---------	2.74E-002
I-131	Not Detected	---------	2.75E-002
IR-192	Not Detected	---------	2.39E-002
K-40	2.25E+001	3.30E+000	5.13E-001
MN-52	Not Detected	---------	3.48E-002
MN-54	Not Detected	---------	3.32E-002
MO-99	Not Detected	---------	3.20E-001
NA-22	Not Detected	---------	4.82E-002
NA-24	Not Detected	---------	1.61E-001
NB-95	Not Detected	---------	1.24E-001
ND-147	Not Detected	---------	1.92E-001
NI-57	Not Detected	---------	8.63E-002
RU-103	Not Detected	---------	2.50E-002
RU-106	Not Detected	---------	2.63E-001
SB-122	Not Detected	---------	4.89E-002
SB-124	Not Detected	---------	2.60E-002
SB-125	Not Detected	---------	6.92E-002
SN-113	Not Detected	---------	3.27E-002
SR-85	Not Detected	---------	3.30E-002
TA-182	Not Detected	---------	1.48E-001
TA-183	Not Detected	---------	1.80E-001
TC-99m	Not Detected	---------	1.00E+000
TL-201	Not Detected	---------	1.12E-001
XE-133	Not Detected	---------	1.10E-001
Y-88	Not Detected	---------	2.88E-002
ZN-65	Not Detected	---------	1.03E-001
ZR-95	Not Detected	---------	5.20E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/21/99 8:34:49 AM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044112-004
Lab Sample ID : 90013006

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 790.000 gram
Sample Date/Time : 1/19/99 3:25:00 PM
Acquire Start Date/Time : 1/20/99 5:51:35 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	7.48E-001
RA-226	1.86E+000	9.72E-001	5.93E-001
PB-214	7.71E-001	1.34E-001	4.44E-002
BI-214	6.70E-001	1.40E-001	4.41E-002
PB-210	Not Detected	---------	3.46E+001
TH-232	8.99E-001	4.02E-001	1.53E-001
RA-228	9.93E-001	3.21E-001	1.33E-001
AC-228	8.88E-001	2.25E-001	7.85E-002
TH-228	9.58E-001	3.00E-001	4.23E-001
RA-224	9.27E-001	2.23E-001	4.15E-002
PB-212	8.96E-001	1.58E-001	3.76E-002
BI-212	9.79E-001	5.22E-001	2.92E-001
TL-208	7.80E-001	1.73E-001	5.83E-002
U-235	Not Detected	---------	2.23E-001
TH-231	Not Detected	---------	1.17E+001
PA-231	Not Detected	---------	1.32E+000
TH-227	Not Detected	---------	3.53E-001
RA-223	Not Detected	---------	1.96E-001
RN-219	Not Detected	---------	3.61E-001
PB-211	Not Detected	---------	8.04E-001
TL-207	Not Detected	---------	1.18E+001
AM-241	Not Detected	---------	4.90E-001
PU-239	Not Detected	---------	4.11E+002
NP-237	~~4.96E-001~~	~~2.45E-001~~	2.84E-001 Not detected
PA-233	Not Detected	---------	5.34E-002
TH-229	Not Detected	---------	2.57E-001

1/21/99

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013006

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---	3.41E-002
AG-110m	Not Detected	---	5.15E-002
BA-133	Not Detected	---	5.64E-002
BE-7	Not Detected	---	2.44E-001
CD-109	Not Detected	---	9.65E-001
CD-115	Not Detected	---	8.87E-002
CE-139	Not Detected	---	2.85E-002
CE-141	Not Detected	---	4.92E-002
CE-144	Not Detected	---	2.15E-001
CO-56	Not Detected	---	2.92E-002
CO-57	Not Detected	---	2.90E-002
CO-58	Not Detected	---	2.95E-002
CO-60	Not Detected	---	3.32E-002
CR-51	Not Detected	---	2.13E-001
CS-134	Not Detected	---	3.37E-002
CS-137	4.14E-001	7.85E-002	2.03E-002
EU-152	Not Detected	---	8.67E-002
EU-154	Not Detected	---	1.65E-001
EU-155	Not Detected	---	1.41E-001
FE-59	Not Detected	---	5.97E-002
GD-153	Not Detected	---	1.06E-001
HG-203	Not Detected	---	2.87E-002
I-131	Not Detected	---	2.82E-002
IR-192	Not Detected	---	2.56E-002
K-40	2.10E+001	2.99E+000	2.16E-001
MN-52	Not Detected	---	3.11E-002
MN-54	Not Detected	---	3.16E-002
MO-99	Not Detected	---	2.56E-001
NA-22	Not Detected	---	3.72E-002
NA-24	Not Detected	---	1.02E-001
NB-95	Not Detected	---	1.90E-001
ND-147	Not Detected	---	1.85E-001
NI-57	Not Detected	---	7.75E-002
RU-103	Not Detected	---	2.68E-002
RU-106	Not Detected	---	2.61E-001
SB-122	Not Detected	---	4.78E-002
SB-124	Not Detected	---	2.62E-002
SB-125	Not Detected	---	7.90E-002
SN-113	Not Detected	---	3.41E-002
SR-85	Not Detected	---	3.39E-002
TA-182	Not Detected	---	1.35E-001
TA-183	Not Detected	---	4.88E-001
TC-99m	Not Detected	---	6.13E-001
TL-201	Not Detected	---	2.12E-001
XE-133	Not Detected	---	1.87E-001
Y-88	Not Detected	---	2.46E-002
ZN-65	Not Detected	---	9.06E-002
ZR-95	Not Detected	---	4.92E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/20/99 9:13:36 PM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044113-004
Lab Sample ID : 90013007

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 949.000 gram
Sample Date/Time : 1/19/99 3:37:00 PM
Acquire Start Date/Time : 1/20/99 7:33:22 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.47E-001
RA-226	1.21E+000	6.49E-001	4.46E-001
PB-214	5.55E-001	1.95E-001	3.61E-002
BI-214	5.01E-001	1.06E-001	3.60E-002
PB-210	Not Detected	---------	2.91E+001
TH-232	7.45E-001	3.84E-001	1.11E-001
RA-228	8.89E-001	2.80E-001	1.16E-001
AC-228	8.13E-001	2.45E-001	6.92E-002
TH-228	8.59E-001	5.21E-001	3.73E-001
RA-224	9.21E-001	2.18E-001	2.85E-002
PB-212	7.86E-001	2.61E-001	3.17E-002
BI-212	9.08E-001	4.91E-001	2.42E-001
TL-208	6.99E-001	1.61E-001	5.24E-002
U-235	Not Detected	---------	1.88E-001
TH-231	Not Detected	---------	1.01E+001
PA-231	Not Detected	---------	1.10E+000
TH-227	Not Detected	---------	3.04E-001
RA-223	Not Detected	---------	1.70E-001
RN-219	Not Detected	---------	2.85E-001
PB-211	Not Detected	---------	6.43E-001
TL-207	Not Detected	---------	1.08E+001
AM-241	Not Detected	---------	4.03E-001
PU-239	Not Detected	---------	3.56E+002
NP-237	Not Detected	---------	2.32E-001
PA-233	Not Detected	---------	4.55E-002
TH-229	Not Detected	---------	2.19E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013007

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	2.94E-002
AG-110m	Not Detected	---------	2.43E-002
BA-133	Not Detected	---------	4.63E-002
BE-7	Not Detected	---------	1.99E-001
CD-109	Not Detected	---------	7.86E-001
CD-115	Not Detected	---------	7.51E-002
CE-139	Not Detected	---------	2.37E-002
CE-141	Not Detected	---------	4.14E-002
CE-144	Not Detected	---------	1.91E-001
CO-56	Not Detected	---------	2.45E-002
CO-57	Not Detected	---------	2.45E-002
CO-58	Not Detected	---------	2.60E-002
CO-60	Not Detected	---------	2.83E-002
CR-51	Not Detected	---------	1.87E-001
CS-134	Not Detected	---------	2.71E-002
CS-137	2.54E-002	2.01E-002	1.82E-002
EU-152	Not Detected	---------	7.37E-002
EU-154	Not Detected	---------	1.40E-001
EU-155	Not Detected	---------	1.24E-001
FE-59	Not Detected	---------	5.95E-002
GD-153	Not Detected	---------	9.35E-002
HG-203	Not Detected	---------	2.48E-002
I-131	Not Detected	---------	2.44E-002
IR-192	Not Detected	---------	2.15E-002
K-40	2.16E+001	3.06E+000	2.04E-001
MN-52	Not Detected	---------	2.74E-002
MN-54	Not Detected	---------	2.67E-002
MO-99	Not Detected	---------	2.45E-001
NA-22	Not Detected	---------	3.35E-002
NA-24	Not Detected	---------	1.00E-001
NB-95	Not Detected	---------	1.65E-001
ND-147	Not Detected	---------	1.59E-001
NI-57	Not Detected	---------	3.58E-002
RU-103	Not Detected	---------	2.15E-002
RU-106	Not Detected	---------	2.30E-001
SB-122	Not Detected	---------	4.32E-002
SB-124	Not Detected	---------	2.17E-002
SB-125	Not Detected	---------	6.61E-002
SN-113	Not Detected	---------	2.85E-002
SR-85	Not Detected	---------	2.79E-002
TA-182	Not Detected	---------	1.15E-001
TA-183	Not Detected	---------	4.04E-001
TC-99m	Not Detected	---------	6.01E-001
TL-201	Not Detected	---------	1.93E-001
XE-133	Not Detected	---------	1.67E-001
Y-88	Not Detected	---------	1.77E-002
ZN-65	Not Detected	---------	7.47E-002
ZR-95	Not Detected	---------	4.31E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/20/99 10:55:23 PM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044114-004
Lab Sample ID : 90013008

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 884.000 gram
Sample Date/Time : 1/19/99 3:49:00 PM
Acquire Start Date/Time : 1/20/99 9:15:10 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.05E-001
RA-226	9.42E-001	6.62E-001	4.07E-001
PB-214	4.65E-001	9.94E-002	3.91E-002
BI-214	4.35E-001	9.99E-002	3.95E-002
PB-210	Not Detected	---------	2.88E+001
TH-232	6.57E-001	3.51E-001	1.11E-001
RA-228	6.26E-001	2.68E-001	1.14E-001
AC-228	7.23E-001	1.98E-001	7.06E-002
TH-228	5.31E-001	5.77E-001	3.20E-001
RA-224	6.78E-001	1.67E-001	2.62E-002
PB-212	6.57E-001	1.37E-001	3.18E-002
BI-212	6.27E-001	5.24E-001	2.38E-001
TL-208	6.06E-001	1.48E-001	4.91E-002
U-235	Not Detected	---------	1.84E-001
TH-231	Not Detected	---------	9.89E+000
PA-231	Not Detected	---------	1.13E+000
TH-227	Not Detected	---------	2.94E-001
RA-223	Not Detected	---------	1.68E-001
RN-219	Not Detected	---------	2.88E-001
PB-211	Not Detected	---------	6.36E-001
TL-207	Not Detected	---------	1.09E+001
AM-241	Not Detected	---------	3.96E-001
PU-239	Not Detected	---------	3.37E+002
NP-237	Not Detected	---------	3.06E-001
PA-233	Not Detected	---------	4.52E-002
TH-229	Not Detected	---------	2.19E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013008

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	2.75E-002
AG-110m	Not Detected	---------	3.71E-002
BA-133	Not Detected	---------	4.50E-002
BE-7	Not Detected	---------	2.01E-001
CD-109	Not Detected	---------	1.02E+000
CD-115	Not Detected	---------	7.63E-002
CE-139	Not Detected	---------	2.38E-002
CE-141	Not Detected	---------	4.10E-002
CE-144	Not Detected	---------	1.84E-001
CO-56	Not Detected	---------	2.59E-002
CO-57	Not Detected	---------	2.45E-002
CO-58	Not Detected	---------	2.57E-002
CO-60	Not Detected	---------	3.03E-002
CR-51	Not Detected	---------	1.82E-001
CS-134	Not Detected	---------	2.88E-002
CS-137	1.92E-001	4.63E-002	1.84E-002
EU-152	Not Detected	---------	7.40E-002
EU-154	Not Detected	---------	1.34E-001
EU-155	Not Detected	---------	1.21E-001
FE-59	Not Detected	---------	6.00E-002
GD-153	Not Detected	---------	9.10E-002
HG-203	Not Detected	---------	2.48E-002
I-131	Not Detected	---------	2.52E-002
IR-192	Not Detected	---------	2.08E-002
K-40	2.21E+001	3.09E+000	1.87E-001
MN-52	Not Detected	---------	2.67E-002
MN-54	Not Detected	---------	2.73E-002
MO-99	Not Detected	---------	2.38E-001
NA-22	Not Detected	---------	3.50E-002
NA-24	Not Detected	---------	1.03E-001
NB-95	Not Detected	---------	1.62E-001
ND-147	Not Detected	---------	1.55E-001
NI-57	Not Detected	---------	6.37E-002
RU-103	Not Detected	---------	2.25E-002
RU-106	Not Detected	---------	2.09E-001
SB-122	Not Detected	---------	4.26E-002
SB-124	Not Detected	---------	2.42E-002
SB-125	Not Detected	---------	6.90E-002
SN-113	Not Detected	---------	2.85E-002
SR-85	Not Detected	---------	2.87E-002
TA-182	Not Detected	---------	1.13E-001
TA-183	Not Detected	---------	3.99E-001
TC-99m	Not Detected	---------	7.14E-001
TL-201	Not Detected	---------	1.90E-001
XE-133	Not Detected	---------	1.65E-001
Y-88	Not Detected	---------	1.73E-002
ZN-65	Not Detected	---------	7.54E-002
ZR-95	Not Detected	---------	4.36E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/21/99 12:37:10 AM

* Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044115-004
Lab Sample ID : 90013009

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 590.000 gram
Sample Date/Time : 1/19/99 4:01:00 PM
Acquire Start Date/Time : 1/20/99 10:56:57 PM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	8.16E-001
RA-226	1.16E+000	6.01E-001	5.53E-001
PB-214	6.29E-001	2.49E-001	5.00E-002
BI-214	5.36E-001	1.35E-001	5.08E-002
PB-210	Not Detected	---------	3.75E+001
TH-232	8.63E-001	4.62E-001	1.68E-001
RA-228	8.68E-001	3.32E-001	1.50E-001
AC-228	7.61E-001	2.33E-001	9.05E-002
TH-228	9.41E-001	7.04E-001	4.78E-001
RA-224	8.37E-001	2.12E-001	4.75E-002
PB-212	8.17E-001	1.28E-001	4.16E-002
BI-212	9.79E-001	5.62E-001	3.47E-001
TL-208	7.15E-001	1.94E-001	6.98E-002
U-235	Not Detected	---------	2.40E-001
TH-231	Not Detected	---------	1.27E+001
PA-231	Not Detected	---------	1.48E+000
TH-227	Not Detected	---------	3.90E-001
RA-223	Not Detected	---------	2.17E-001
RN-219	Not Detected	---------	3.78E-001
PB-211	Not Detected	---------	8.59E-001
TL-207	Not Detected	---------	1.39E+001
AM-241	Not Detected	---------	5.19E-001
PU-239	Not Detected	---------	4.48E+002
NP-237	Not Detected	---------	3.96E-001
PA-233	Not Detected	---------	5.92E-002
TH-229	Not Detected	---------	2.77E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013009

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.69E-002
AG-110m	Not Detected	---------	5.50E-002
BA-133	Not Detected	---------	6.13E-002
BE-7	Not Detected	---------	2.63E-001
CD-109	~~1.38E+000~~	~~8.89E-001~~	~~1~~.01E+000
CD-115	Not Detected	---------	1.05E-001
CE-139	Not Detected	---------	3.15E-002
CE-141	Not Detected	---------	5.31E-002
CE-144	Not Detected	---------	2.36E-001
CO-56	Not Detected	---------	3.54E-002
CO-57	Not Detected	---------	3.16E-002
CO-58	Not Detected	---------	3.32E-002
CO-60	Not Detected	---------	3.79E-002
CR-51	Not Detected	---------	2.38E-001
CS-134	Not Detected	---------	3.78E-002
CS-137	3.37E-001	7.47E-002	2.35E-002
EU-152	Not Detected	---------	9.54E-002
EU-154	Not Detected	---------	1.81E-001
EU-155	Not Detected	---------	1.56E-001
FE-59	Not Detected	---------	7.05E-002
GD-153	Not Detected	---------	1.19E-001
HG-203	Not Detected	---------	3.25E-002
I-131	Not Detected	---------	3.47E-002
IR-192	Not Detected	---------	2.75E-002
K-40	2.18E+001	3.17E+000	2.68E-001
MN-52	Not Detected	---------	3.82E-002
MN-54	Not Detected	---------	3.82E-002
MO-99	Not Detected	---------	3.25E-001
NA-22	Not Detected	---------	4.54E-002
NA-24	Not Detected	---------	1.54E-001
NB-95	Not Detected	---------	2.19E-001
ND-147	Not Detected	---------	2.21E-001
NI-57	Not Detected	---------	4.76E-002
RU-103	Not Detected	---------	2.92E-002
RU-106	Not Detected	---------	2.87E-001
SB-122	Not Detected	---------	5.65E-002
SB-124	Not Detected	---------	3.13E-002
SB-125	Not Detected	---------	9.17E-002
SN-113	~~1.05E-002~~	~~1.66E-002~~	1.85E-002
SR-85	Not Detected	---------	3.80E-002
TA-182	Not Detected	---------	1.64E-001
TA-183	Not Detected	---------	5.32E-001
TC-99m	Not Detected	---------	1.13E+000
TL-201	Not Detected	---------	2.51E-001
XE-133	Not Detected	---------	2.19E-001
Y-88	Not Detected	---------	2.31E-002
ZN-65	Not Detected	---------	1.04E-001
ZR-95	Not Detected	---------	5.57E-002

Not detected 1/21/99

Not detected 1/21/99

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/21/99 2:18:57 AM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : 044196-004
Lab Sample ID : 90013010

Sample Description : MARINELLI SOLID SAMPLE
Sample Quantity : 895.000 gram
Sample Date/Time : 1/19/99 3:37:00 PM
Acquire Start Date/Time : 1/21/99 12:38:43 AM
Detector Name : LAB02
Elapsed Live/Real Time : 6000 / 6004 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	---------	6.69E-001
RA-226	1.30E+000	7.77E-001	4.29E-001
PB-214	5.36E-001	1.19E-001	4.31E-002
BI-214	5.48E-001	1.13E-001	3.79E-002
PB-210	Not Detected	---------	3.05E+001
TH-232	8.13E-001	4.25E-001	1.33E-001
RA-228	8.25E-001	2.72E-001	1.22E-001
AC-228	8.29E-001	1.53E-001	6.71E-002
TH-228	8.82E-001	8.36E-001	3.98E-001
RA-224	8.98E-001	2.14E-001	3.34E-002
PB-212	8.60E-001	1.52E-001	3.21E-002
BI-212	8.78E-001	5.24E-001	2.75E-001
TL-208	7.29E-001	1.38E-001	5.36E-002
U-235	Not Detected	---------	1.93E-001
TH-231	Not Detected	---------	1.09E+001
PA-231	Not Detected	---------	1.16E+000
TH-227	Not Detected	---------	3.18E-001
RA-223	Not Detected	---------	1.81E-001
RN-219	Not Detected	---------	3.05E-001
PB-211	Not Detected	---------	6.82E-001
TL-207	Not Detected	---------	1.12E+001
AM-241	Not Detected	---------	4.24E-001
PU-239	Not Detected	---------	3.67E+002
NP-237	Not Detected	---------	2.36E-001
PA-233	Not Detected	---------	4.53E-002
TH-229	Not Detected	---------	2.29E-001

Note: Ra-226 and U-235 gamma peaks interfere. Either isotope may be over-estimated.

[Summary Report] - Sample ID: : 90013010

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	---------	3.00E-002
AG-110m	Not Detected	---------	2.60E-002
BA-133	Not Detected	---------	4.69E-002
BE-7	Not Detected	---------	1.94E-001
CD-109	Not Detected	---------	8.02E-001
CD-115	Not Detected	---------	8.49E-002
CE-139	Not Detected	---------	2.55E-002
CE-141	Not Detected	---------	4.28E-002
CE-144	Not Detected	---------	2.02E-001
CO-56	Not Detected	---------	2.80E-002
CO-57	Not Detected	---------	2.63E-002
CO-58	Not Detected	---------	2.60E-002
CO-60	Not Detected	---------	3.24E-002
CR-51	Not Detected	---------	1.97E-001
CS-134	Not Detected	---------	2.97E-002
CS-137	1.20E-002	1.63E-002	1.59E-002
EU-152	Not Detected	---------	7.85E-002
EU-154	Not Detected	---------	1.45E-001
EU-155	Not Detected	---------	1.31E-001
FE-59	Not Detected	---------	6.28E-002
GD-153	Not Detected	---------	9.62E-002
HG-203	Not Detected	---------	2.62E-002
I-131	Not Detected	---------	2.58E-002
IR-192	Not Detected	---------	2.21E-002
K-40	2.39E+001	3.36E+000	2.02E-001
MN-52	Not Detected	---------	2.74E-002
MN-54	Not Detected	---------	1.94E-002
MO-99	Not Detected	---------	2.68E-001
NA-22	Not Detected	---------	3.57E-002
NA-24	Not Detected	---------	1.20E-001
NB-95	Not Detected	---------	1.80E-001
ND-147	Not Detected	---------	1.79E-001
NI-57	Not Detected	---------	4.66E-002
RU-103	Not Detected	---------	2.39E-002
RU-106	Not Detected	---------	2.30E-001
SB-122	Not Detected	---------	4.59E-002
SB-124	Not Detected	---------	2.34E-002
SB-125	Not Detected	---------	6.93E-002
SN-113	Not Detected	---------	3.13E-002
SR-85	Not Detected	---------	2.95E-002
TA-182	Not Detected	---------	1.26E-001
TA-183	Not Detected	---------	4.35E-001
TC-99m	Not Detected	---------	1.15E+000
TL-201	Not Detected	---------	2.11E-001
XE-133	Not Detected	---------	1.90E-001
Y-88	Not Detected	---------	1.94E-002
ZN-65	Not Detected	---------	8.21E-002
ZR-95	Not Detected	---------	4.52E-002

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program [806 Laboratory]
1/21/99 6:29:13 AM

Analyzed by: 1/21/99 Reviewed by: 1/21/99

Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90013011

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/21/99 6:18:59 AM
Detector Name : LAB01
Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---------	2.60E+003
RA-226	Not Detected	---------	5.18E+003
PB-214	Not Detected	---------	7.17E+002
BI-214	Not Detected	---------	6.59E+002
PB-210	Not Detected	---------	6.88E+004
TH-232	Not Detected	---------	2.20E+003
RA-228	Not Detected	---------	2.98E+003
AC-228	Not Detected	---------	1.75E+003
TH-228	Not Detected	---------	1.30E+005
RA-224	Not Detected	---------	7.91E+003
PB-212	Not Detected	---------	8.95E+003
BI-212	Not Detected	---------	9.22E+004
TL-208	Not Detected	---------	1.94E+004
U-235	Not Detected	---------	1.41E+003
TH-231	Not Detected	---------	4.40E+004
PA-231	Not Detected	---------	1.38E+004
TH-227	Not Detected	---------	2.33E+003
RA-223	Not Detected	---------	1.00E+026
RN-219	Not Detected	---------	6.00E+003
PB-211	Not Detected	---------	1.35E+004
TL-207	Not Detected	---------	2.59E+005
AM-241	8.37E+004	1.43E+004	1.35E+003
PU-239	Not Detected	---------	2.37E+006
NP-237	Not Detected	---------	1.33E+003
PA-233	Not Detected	---------	6.27E+002
TH-229	Not Detected	---------	1.13E+003

[Summary Report] - Sample ID: : 90013011

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	3.59E+002
AG-110m	Not Detected	---------	7.61E+006
BA-133	Not Detected	---------	7.82E+002
BE-7	Not Detected	---------	3.32E+020
CD-109	4.51E+005	5.72E+005	3.24E+005
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	6.92E+008
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	2.03E+006
CO-56	Not Detected	---------	2.19E+014
CO-57	Not Detected	---------	3.65E+005
CO-58	Not Detected	---------	2.27E+015
CO-60	7.72E+004	1.06E+004	5.79E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	4.88E+003
CS-137	6.99E+004	9.39E+003	3.07E+002
EU-152	Not Detected	---------	7.95E+002
EU-154	Not Detected	---------	3.06E+003
EU-155	Not Detected	---------	2.62E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	2.51E+006
HG-203	Not Detected	---------	7.04E+021
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	5.13E+014
K-40	Not Detected	---------	1.69E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	3.27E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	1.90E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	9.06E+005
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	3.13E+017
SB-125	Not Detected	---------	9.00E+003
SN-113	Not Detected	---------	3.27E+010
SR-85	Not Detected	---------	3.39E+016
TA-182	Not Detected	---------	9.49E+010
TA-183	Not Detected	---------	1.00E+026
TC-99m	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	5.47E+010
ZN-65	Not Detected	---------	5.04E+006
ZR-95	Not Detected	---------	7.79E+016

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* Sandia National Laboratories

* Radiation Protection Sample Diagnostics Program

* Quality Assurance Report

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Report Date : 1/21/99 6:29:16 AM
QA File : C:\GENIE2K\CAMFILES\LCS1.QAF
Analyst : FCD
Sample ID : 90013011
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/21/99 6:18:59 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	<	LU	:	SD	:	UD	:
AM-241 ACTIVITY	8.553E-002	2.525E-003	8.371E-002	<		:		:		:
CS-137 Activity	6.836E-002	9.861E-004	6.994E-002	<		:		:		:
CO-60 Activity	7.598E-002	2.687E-003	7.793E-002	<		:		:		:

Flags Key: LU = Boundary Test (Ab = Above , Be = Bel
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Act
UD = User Driven N-Sigma Test (In = Investigate, Ac = Act
BS = Measurement Bias Test (In = Investigate, Ac = Act

Reviewed by: 1/21/99

Survey #:_____

Page _____ of _____

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* Sandia National Laboratories *

* Radiation Protection Sample Diagnostics Program [806 Laboratory] *

* 1/21/99 6:04:06 AM *

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* Analyzed by: 1/21/99 Reviewed by: 1.12.99 *

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Customer : C.BYRD/R.RIVERA (6134/SMO)
Customer Sample ID : LAB CONTROL SAMPLE USING CG134
Lab Sample ID : 90013012

Sample Description : MIXED_GAMMA_STANDARD_CG134
Sample Quantity : 1.000 Each
Sample Date/Time : 11/01/90 12:00:00 PM
Acquire Start Date/Time : 1/21/99 5:53:52 AM
Detector Name : LAB02
Elapsed Live/Real Time : 600 / 606 seconds

Comments:

****

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	---	4.14E+003
RA-226	Not Detected	---	5.78E+003
PB-214	Not Detected	---	6.36E+002
BI-214	Not Detected	---	5.46E+002
PB-210	Not Detected	---	2.67E+005
TH-232	Not Detected	---	1.94E+003
RA-228	Not Detected	---	2.32E+003
AC-228	Not Detected	---	1.37E+003
TH-228	Not Detected	---	1.22E+005
RA-224	Not Detected	---	4.53E+003
PB-212	Not Detected	---	9.31E+003
BI-212	Not Detected	---	7.56E+004
TL-208	Not Detected	---	1.68E+004
U-235	Not Detected	---	1.61E+003
TH-231	Not Detected	---	7.51E+004
PA-231	Not Detected	---	1.29E+004
TH-227	Not Detected	---	2.43E+003
RA-223	Not Detected	---	1.00E+026
RN-219	Not Detected	---	5.46E+003
PB-211	Not Detected	---	1.23E+004
TL-207	Not Detected	---	1.98E+005
AM-241	7.80E+004	7.97E+004	2.83E+003
PU-239	Not Detected	---	2.83E+006
NP-237	Not Detected	---	2.13E+003
PA-233	Not Detected	---	5.49E+002
TH-229	Not Detected	---	1.75E+003

Survey #:_____

Page _____ of _____

[Summary Report] - Sample ID: : 90013012

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	---------	2.89E+002
AG-110m	Not Detected	---------	5.99E+006
BA-133	Not Detected	---------	6.85E+002
BE-7	Not Detected	---------	2.82E+020
CD-109	Not Detected	---------	6.11E+005
CD-115	Not Detected	---------	1.00E+026
CE-139	Not Detected	---------	7.86E+008
CE-141	Not Detected	---------	1.00E+026
CE-144	Not Detected	---------	2.37E+006
CO-56	Not Detected	---------	1.66E+014
CO-57	Not Detected	---------	4.42E+005
CO-58	Not Detected	---------	1.68E+015
CO-60	8.20E+004	1.10E+004	4.18E+002
CR-51	Not Detected	---------	1.00E+026
CS-134	Not Detected	---------	4.16E+003
CS-137	7.16E+004	9.51E+003	2.37E+002
EU-152	Not Detected	---------	9.56E+002
EU-154	Not Detected	---------	2.46E+003
EU-155	Not Detected	---------	3.29E+003
FE-59	Not Detected	---------	1.00E+026
GD-153	Not Detected	---------	4.07E+006
HG-203	Not Detected	---------	6.61E+021
I-131	Not Detected	---------	1.00E+026
IR-192	Not Detected	---------	4.59E+014
K-40	Not Detected	---------	1.30E+003
MN-52	Not Detected	---------	1.00E+026
MN-54	Not Detected	---------	2.48E+005
MO-99	Not Detected	---------	1.00E+026
NA-22	Not Detected	---------	1.71E+003
NA-24	Not Detected	---------	1.00E+026
NB-95	Not Detected	---------	1.00E+026
ND-147	Not Detected	---------	1.00E+026
NI-57	Not Detected	---------	1.00E+026
RU-103	Not Detected	---------	1.00E+026
RU-106	Not Detected	---------	7.45E+005
SB-122	Not Detected	---------	1.00E+026
SB-124	Not Detected	---------	2.76E+017
SB-125	Not Detected	---------	8.33E+003
SN-113	Not Detected	---------	2.91E+010
SR-85	Not Detected	---------	2.88E+016
TA-182	Not Detected	---------	7.20E+010
TA-183	Not Detected	---------	1.00E+026
TC-99m	Not Detected	---------	1.00E+026
TL-201	Not Detected	---------	1.00E+026
XE-133	Not Detected	---------	1.00E+026
Y-88	Not Detected	---------	4.19E+010
ZN-65	Not Detected	---------	3.70E+006
ZR-95	Not Detected	---------	6.05E+016

****

* Sandia National Laboratories

* Radiation Protection Sample Diagnostics Program

* Quality Assurance Report

****

Report Date : 1/21/99 6:04:10 AM
QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
Analyst : FCD
Sample ID : 90013012
Sample Quantity : 1.00 Each
Sample Date : 11/01/90 12:00:00 PM
Measurement Date : 1/21/99 5:53:52 AM
Elapsed Live Time : 600 seconds
Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	<	LU	:	SD	:	UD	:
AM-241 Activity	8.193E-002	4.095E-003	7.805E-002	<		:		:		:
CS-137 Activity	7.056E-002	1.986E-003	7.157E-002	<		:		:		:
CO-60 Activity	7.852E-002	2.177E-003	8.103E-002	<		:		:		:

Flags Key: LU = Boundary Test (Ab = Above , Be = Belo
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Acti
UD = User Driven N-Sigma Test (In = Investigate, Ac = Acti
BS = Measurement Bias Test (In = Investigate, Ac = Acti

Reviewed by: _____ 1/21/99

ID:0443617 PAGE

Shipping Code [illegible] Control No. [illegible]

SHIPPER

SF 6951-AEC (5-88)
Supersedes (1-98) Issue

Sandia National Laboratories
1515 Eubank SE
Albuquerque, NM 87123

Blocks with RED letters are required.
Press F1 for instructions for each field.
NOTE: If text entered wraps, the form could print on second page.

(1) FROM:
☒ New Mexico
☐ California
☐ Other

Before Filling Out Form Call 845-0068 for Document Number | (2) Document N 716551

(3) SHIP TO:

General Engineering Laboratories
Attn: Edie Kent Tel: 843-556-8171
2040 Savage Rd.
Charleston, SC 29414

Contract#: AJ-2480A ~~9/310~~ 601331

COC #: 601005, 601144, 601314
NO

(10) RMA # (if applicable) SITE 2 VCM, SITE 8/58 LURALEE CANYON BURN SITES.

(4) Date Prepared: 1-22-99
(5) Highest Material Security Classification: UNC
(6) Page 1 of

(7) Nuclear Explosive-Like Assembly (NELA)? ☐ Yes ☒ No
(8) Date to be returned: ☒ No Return
(9) Date Due at Destination 1-23-99 ☒ Firm: (CA only-see instructions or press for PTA justification) ☐ Fixed (Must be commercial transportation)

* SATURDAY DELIVERY

(11a) Form Filled Out By (Name): Robert P. Rivera, 7578
(11b) Phone: 505-845-0868
(12) Case No: 0876.123000
Freight Billing: Sandia Pays ☒ Consignee Pays ☐ If Consignee Pays, Carrier & acct. no.

(14a) Requester Name: Same
(14b) Org: 7578
(14c) MS: 1042
(14d) Phone: 505-845-0868
(14e) SSN: 375-64-5982

Pickup Location: (15a) Bldg: N/A
(15b) Room: N/A
New Sandia Location (if applicable) (16a) Site Code: N/A
(16b) Bldg: N/A
(16c) Room: N/A
(16d) Org: N/A

(17) Reason for Shipment: (must select one): Analysis/Testing
(18) Authority Number: N/A
(19) DOE Transportation Safeguards Dept. Courier Required? ☐ Yes ☒ No

(20) Item No.	(21) Sec. Class.	(22) Qty	(23) Unit	(24) Haz. Matl.	(25) Property Tag No. and/or MID No.	(26) Description	(27) Unit Value	Total $
1	UNC	7	EA	N	N/A	Environmental Solid/Liquid	$0.00	$0.00
						Samples		$0.00
						Last Item		$0.00
						Cooler #1: 3.0 cu ft / 35 lbs 601005		$0.00
						Cooler #2: 3.0 cu ft / 45 lbs 601144		$0.00
						Cooler #3: 4.0 cu ft / 70 lbs 601314		$0.00
						Cooler #4: 3.0 cu ft / 54 lbs 601331		$0.00
						Cooler #5: 3.0 cu ft / 47 lbs 601331		$0.00
						Cooler #6: 3.0 cu ft / 54 lbs 601310		$0.00
						Cooler #7: 3.0 cu ft / 48 lbs		$0.00
						Cooler #8: / lbs		$0.00
						SANDIA SHIPPING ONLY: Please FAX a copy of this Shipper to SMO at 844-4976. Thanks!		$0.00
				1/22/99			Grand Total	$0.00

(28) Type or print approval name: R. P. Rivera, 7578
Authorizing Signature: [signature]
Manager or delegated authority
I certify that the material being offered for shipment is non hazardous unless noted as hazardous in block 24 and required information is being provided.

(29) Special Approval (International): Signature Org.
(30) Special Approval (Service Crew, DOE): Signature Org.
(31) Recipient's Signature/Co. Signature/Co. Date
(32) Contracting or GFP Rep. Signature Date

Received in Shipping: Date 1/22/99 Time 1230
Shipping Service Clerk: [illegible]
Property Management Rep: 4223 3365 9302
The listed material and accompanying information have been examined and the hazardous material descriptions and all preparations for shipment are certified correct.
Hazardous Material Consultant

Date Shipped or Handcarried:	Routing:	Bill:	No. of Pieces	Weight	Dimension	Packed by
1/22/99 FEDERAL EXPRESS	[illegible]	4223 3365 9298 4223 3365 9287 4223 3365 9276 4223 3365 9265 4223 3365 9254 4223 3365 9243	7	353 lbs	22 cu ft	[illegible]

Survey page 3

****

Sandia Radiation Protection Sample Diagnostics Program
Wednesday, January 20, 1999 (10:09:13 AM)

****

LSC Analysis Program - Version: 2.0.002

Batch Number : 93005301
Count Protocol : 7
Client : ER78 1/19/99 1700 A. TUCKER 7523 93005301
Laboratory ID : 6921 - S#411293
Count Date : 20-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 0 - 12
Count Time : 5 minutes
Background cpm : 27.8 +/- 5.41
Background tSIE : 448
Background Eff : .3806
Sample Aliquot : 1 swipe(s)

H-3 MDA = 3.03E+01 dpm/swipe
H-3 CL = 1.44E+01 dpm/swipe

Tritium Sys. Error : 12.9%
Tritium Efficiency : 0.9385 - exp(-0.0029003*tSIE^0.8689)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

Analyzed by: R T Preston 1/20/99 Reviewed by: R T Preston 1/20/99

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	H-3 Activity dpm/swipe	2s Err
001	1	1.00E+00	1.96E+01	4.12E+00	424	0.365	-2.25E+01	2.90E+
002	2	1.00E+00	2.20E+01	4.31E+00	420	0.363	-1.60E+01	2.88E+
003	3	1.00E+00	2.16E+01	4.31E+00	418	0.361	-1.72E+01	2.91E+
004	4	1.00E+00	2.24E+01	4.38E+00	417	0.360	-1.50E+01	2.91E+
005	5	1.00E+00	1.90E+01	4.14E+00	423	0.365	-2.41E+01	2.93E+
006	6	1.00E+00	1.82E+01	4.06E+00	424	0.365	-2.63E+01	2.93E+
007	7	1.00E+00	2.48E+01	4.66E+00	422	0.364	-8.24E+00	2.88E+
008	8	1.00E+00	2.02E+01	4.25E+00	420	0.363	-2.10E+01	2.93E+
009	9	1.00E+00	2.14E+01	4.47E+00	422	0.364	-1.76E+01	2.94E+
010	10	1.00E+00	2.08E+01	4.31E+00	419	0.362	-1.93E+01	2.93E+
011	11	1.00E+00	2.02E+01	4.25E+00	412	0.357	-2.13E+01	2.98E+
012	12	1.00E+00	2.06E+01	4.40E+00	415	0.359	-2.00E+01	2.99E+
013	13	1.00E+00	2.30E+01	4.75E+00	422	0.364	-1.32E+01	2.96E+
014	14	1.00E+00	1.72E+01	4.12E+00	405	0.352	-3.01E+01	3.09E+
015	15	1.00E+00	2.28E+01	4.63E+00	415	0.359	-1.39E+01	2.98E+
016	16	1.00E+00	1.68E+01	4.08E+00	413	0.358	-3.07E+01	3.05E+
017	17	1.00E+00	1.84E+01	4.23E+00	413	0.358	-2.63E+01	3.03E+

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Sandia Radiation Protection Sample Diagnostics Program
Wednesday, January 20, 1999
****
LSC Analysis Program - Version: 2.0.002

RPSD	Client						Activity	
018	18	1.00E+00	1.92E+01	4.27E+00	410	0.356	-2.41E+01	3.03E+01

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Alluvium 5156

Page 5 of 6

****

Sandia Radiation Protection Sample Diagnostics Program
Wednesday, January 20, 1999 (10:09:13 AM)

****

LSC Analysis Program - Version: 2.0.002

Batch Number : 93005301
Count Protocol : 7
Client : ER78 1/19/99 1700 A. TUCKER 7523 93005301
Laboratory ID : 6921 - S#411293
Count Date : 20-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 20 - 600
Count Time : 5 minutes
Background cpm : 3.4 +/- 1.65
Background tSIE : 448
Background Eff : .978
Sample Aliquot : 1 swipe(s)

Gross Alpha MDA = 4.48E+00 dpm/swipe
Gross Alpha CL = 1.96E+00 dpm/swipe

Alpha Sys. Error : 8.9%
Alpha Efficiency : 0.978 - exp(-0.0106*tSIE^1.2486)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	Gross Alpha Activi dpm/swipe	2s Erro
001	1	1.00E+00	3.20E+00	1.60E+00	424	0.978	-2.04E-01	3.34E+0
002	2	1.00E+00	1.20E+00	9.80E-01	420	0.978	-2.25E+00	2.89E+0
003	3	1.00E+00	1.80E+00	1.20E+00	418	0.978	-1.64E+00	3.06E+0
004	4	1.00E+00	1.60E+00	1.13E+00	417	0.978	-1.84E+00	3.01E+0
005	5	1.00E+00	2.00E+00	1.26E+00	423	0.978	-1.43E+00	3.11E+0
006	6	1.00E+00	3.00E+00	1.55E+00	424	0.978	-4.09E-01	3.31E+0
007	7	1.00E+00	2.40E+00	1.39E+00	422	0.978	-1.02E+00	3.19E+0
008	8	1.00E+00	2.20E+00	1.33E+00	420	0.978	-1.23E+00	3.15E+0
009	9	1.00E+00	3.00E+00	1.55E+00	422	0.978	-4.09E-01	3.31E+0
010	10	1.00E+00	4.00E+00	1.79E+00	419	0.978	6.13E-01	3.57E+0
011	11	1.00E+00	2.60E+00	1.44E+00	412	0.978	-8.18E-01	3.23E+0
012	12	1.00E+00	1.40E+00	1.06E+00	415	0.978	-2.04E+00	2.95E+0
013	13	1.00E+00	3.40E+00	1.65E+00	422	0.978	0.00E+00	3.37E+0
014	14	1.00E+00	1.60E+00	1.13E+00	405	0.978	-1.84E+00	3.01E+0
015	15	1.00E+00	1.80E+00	1.20E+00	415	0.978	-1.64E+00	3.06E+0
016	16	1.00E+00	3.40E+00	1.65E+00	413	0.978	0.00E+00	3.37E+0
017	17	1.00E+00	3.20E+00	1.60E+00	413	0.978	-2.04E-01	3.34E+0
018	18	1.00E+00	2.60E+00	1.44E+00	410	0.978	-8.18E-01	3.23E+0

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Survey #515
page 6 of 6

****
Sandia Radiation Protection Sample Diagnostics Program
Wednesday, January 20, 1999 (10:09:14 AM)
****
LSC Analysis Program - Version: 2.0.002

Batch Number : 93005301
Count Protocol : 7
Client : ER78 1/19/99 1700 A. TUCKER 7523 93005301
Laboratory ID : 6921 - S#411293
Count Date : 20-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 12 - 2000
Count Time : 5 minutes
Background cpm : 46.8 +/- 6.12
Background tSIE : 448
Background Eff : .931
Sample Aliquot : 1 swipe(s)

Gross Beta MDA = 1.59E+01 dpm/swipe
Gross Beta CL = 7.66E+00 dpm/swipe

Beta Sys. Error : 6.3%
Beta Efficiency : 0.9314 - exp(-0.031*tSIE^0.9041)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	Gross Beta Activity dpm/swipe	2s Error
001	1	1.00E+00	3.42E+01	5.23E+00	424	0.931	-1.35E+01	1.30E+01
002	2	1.00E+00	4.48E+01	5.99E+00	420	0.931	-2.15E+00	1.31E+01
003	3	1.00E+00	4.20E+01	5.80E+00	418	0.931	-5.16E+00	1.31E+01
004	4	1.00E+00	4.34E+01	5.89E+00	417	0.931	-3.65E+00	1.31E+01
005	5	1.00E+00	4.04E+01	5.68E+00	423	0.931	-6.88E+00	1.31E+01
006	6	1.00E+00	3.92E+01	5.60E+00	424	0.931	-8.17E+00	1.31E+01
007	7	1.00E+00	3.96E+01	5.63E+00	422	0.931	-7.74E+00	1.31E+01
008	8	1.00E+00	3.98E+01	5.64E+00	420	0.931	-7.52E+00	1.31E+01
009	9	1.00E+00	3.50E+01	5.29E+00	422	0.931	-1.27E+01	1.31E+01
010	10	1.00E+00	4.04E+01	5.68E+00	419	0.931	-6.88E+00	1.31E+01
011	11	1.00E+00	4.22E+01	5.81E+00	412	0.931	-4.94E+00	1.31E+01
012	12	1.00E+00	4.38E+01	5.92E+00	415	0.931	-3.22E+00	1.31E+01
013	13	1.00E+00	4.10E+01	5.73E+00	422	0.931	-6.23E+00	1.31E+01
014	14	1.00E+00	4.02E+01	5.67E+00	405	0.931	-7.09E+00	1.31E+01
015	15	1.00E+00	4.02E+01	5.67E+00	415	0.931	-7.09E+00	1.31E+01
016	16	1.00E+00	4.46E+01	5.97E+00	413	0.931	-2.36E+00	1.31E+01
017	17	1.00E+00	4.02E+01	5.67E+00	413	0.931	-7.09E+00	1.31E+01
018	18	1.00E+00	3.50E+01	5.29E+00	410	0.931	-1.27E+01	1.31E+01

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Survey Number: S15667

RADIOLOGICAL SURVEY FORM

Location	Requester/Dept.	Date	Time	Duration
ER Site #58	Mike Young #6134	011899	1505	N/A

Purpose	Request #	RWP #	RPIR #
Release the exterior of soil samples only.	N/A	RWP0309	N/A

Instrument and Probe Type and Serial Number		Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1/HP-260/#2356	N/A	John P. Kilbane	John P. Kilbane
Bicron Micro Rem #B776L	N/A	N/A	N/A
N/A	N/A	N/A	N/A

#	Item Description/Location	BETA-GAMMA CONTAMINATION Counting Data Attached ☒ Yes ☐ No				ALPHA CONTAMINATION Counting Data Attached ☒ Yes ☐ No				RADIATION SURVEY	
		%Eff. cpm	20 Bkg cpm	/Radionuclide dpm / 100 cm² (1)	DU (2) T/R/F	%Eff cpm	N/A Bkg cpm	/Radionuclide dpm / 100 cm² (1)	DU (2) T/R/F	Bkg. 7µrem/hr µrem/hr (3)	Distance
1	Sample #044109-004 Sample #044109-001	≤80	80	ND	T				R	≤7	Contact
2	Sample #044107-004 Sample #044107-001	≤80	80	ND	T				R	≤7	Contact
3	Sample #044108-004 Sample #044108-001	≤80	80	ND	T				R	≤7	Contact
4	Sample #044195-001 Sample #044195002	≤80	80	ND	T				R	≤7	Contact
5	Sample #044124-001 Sample #044124-002	≤80	80	ND	T				R	≤7	Contact
6	Sample #044123-001 Sample #044123-002	≤80	80	ND	T				R	≤7	Contact
7	Sample # 044122-001 Sample #044122-002	≤80	80	ND	T				R	≤7	Contact
8	Sample #044121-001 Sample #044121-002	≤80	80	ND	T				R	≤7	Contact
9	Sample #044120-001 Sample #044120-002	≤80	80	ND	T				R	≤7	Contact
10	Sample #044119-001 Sample #044119-002	≤80	80	ND	T				R	≤7	Contact
						N					
						A					

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable/Fixed. Note (3): Indicate type, of other than gamma (i.e., η or β).

Remarks

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****
Sandia Radiation Protection Sample Diagnostics Program
Tuesday, January 19, 1999 (9:11:49 AM)
****

LSC Analysis Program - Version: 2.0.002

2-
#51566

Batch Number : 93004901
Count Protocol : 9
Client : ER 58 SAMPLES 1/18/99 J.P. KILBANE (7523) 9300490
Laboratory ID : 6921 - S#411293
Count Date : 19-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 0 - 12
Count Time : 5 minutes
Background cpm : 21.6 +/- 4.38
Background tSIE : 449
Background Eff : .3815
Sample Aliquot : 1 swipe(s)

H-3 MDA = 2.68E+01 dpm/swipe
H-3 CL = 1.27E+01 dpm/swipe

Tritium Sys. Error : 12.9%
Tritium Efficiency : 0.9385 - exp(-0.0029003*tSIE^0.8689)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

COPY

Analyzed by: RT Preston 1/19/99 Reviewed by: RT Preston 1/19/99

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	H-3 Activity dpm/swipe	2s Err
001	1	1.00E+00	2.12E+01	5.00E+00	436	0.373	-1.07E+00	2.53E+
002	2	1.00E+00	2.16E+01	5.12E+00	431	0.370	0.00E+00	2.57E+
003	3	1.00E+00	2.34E+01	5.38E+00	433	0.371	4.85E+00	2.69E+
004	4	1.00E+00	1.66E+01	4.92E+00	431	0.370	-1.35E+01	2.69E+
005	5	1.00E+00	1.86E+01	5.01E+00	441	0.376	-7.97E+00	2.60E+
006	6	1.00E+00	2.26E+01	5.32E+00	434	0.372	2.69E+00	2.65E+
007	7	1.00E+00	2.20E+01	5.46E+00	435	0.372	1.07E+00	2.66E+
008	8	1.00E+00	2.52E+01	5.69E+00	437	0.374	9.64E+00	2.82E+
009	9	1.00E+00	2.34E+01	5.67E+00	432	0.370	4.86E+00	2.78E+
010	10	1.00E+00	1.82E+01	4.61E+00	437	0.374	-9.10E+00	2.53E+

****

Sandia Radiation Protection Sample Diagnostics Program
Tuesday, January 19, 1999 (9:11:49 AM)

****

LSC Analysis Program - Version: 2.0.002

3-4
#5150

Batch Number : 93004901
Count Protocol : 9
Client : ER 58 SAMPLES 1/18/99 J.P. KILBANE (7523) 930049(
Laboratory ID : 6921 - S#411293
Count Date : 19-Jan-99
Protocol Name : H3AB -- SWIPE
Region of Interest : 20 - 600
Count Time : 5 minutes
Background cpm : 4.6 +/- 1.92
Background tSIE : 449
Background Eff : .978
Sample Aliquot : 1 swipe(s)

Gross Alpha MDA = 5.12E+00 dpm/swipe
Gross Alpha CL = 2.29E+00 dpm/swipe

Alpha Sys. Error : 8.9%
Alpha Efficiency : 0.978 - exp(-0.0106*tSIE^1.2486)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
<CL : Result < 2-sigma Error and Result < Critical Level.
@CL : Result < 2-sigma Error and Result > Critical Level.
@CL : Result > 2-sigma Error and Result < Critical Level.
ERR : Efficiency <= 0.

COPY

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	Gross Alpha Activ dpm/swipe	2s Er
001	1	1.00E+00	4.40E+00	1.88E+00	436	0.978	-2.04E-01	3.90E-
002	2	1.00E+00	4.80E+00	1.96E+00	431	0.978	2.04E-01	3.98E-
003	3	1.00E+00	5.20E+00	2.04E+00	433	0.978	6.13E-01	4.10E-
004	4	1.00E+00	2.80E+00	1.50E+00	431	0.978	-1.84E+00	3.66E-
005	5	1.00E+00	3.80E+00	1.74E+00	441	0.978	-8.18E-01	3.82E-
006	6	1.00E+00	3.80E+00	1.74E+00	434	0.978	-8.18E-01	3.82E-
007	7	1.00E+00	2.80E+00	1.50E+00	435	0.978	-1.84E+00	3.66E-
008	8	1.00E+00	4.00E+00	1.79E+00	437	0.978	-6.13E-01	3.85E-
009	9	1.00E+00	3.40E+00	1.65E+00	432	0.978	-1.23E+00	3.76E-
010	10	1.00E+00	3.40E+00	1.65E+00	437	0.978	-1.23E+00	3.76E-

```
**********************************************************************
Sandia Radiation Protection Sample Diagnostics Program
Tuesday, January 19, 1999 (9:11:50 AM)
**********************************************************************
LSC Analysis Program - Version: 2.0.002                          4-4
                                                                 #51566

Batch Number        : 93004901
Count Protocol      : 9
Client              : ER 58 SAMPLES 1/18/99 J.P. KILBANE (7523) 9300490
Laboratory ID       : 6921 - S#411293
Count Date          : 19-Jan-99
Protocol Name       : H3AB -- SWIPE
Region of Interest  : 12 - 2000
Count Time          : 5 minutes
Background cpm      : 42. +/- 5.8
Background tSIE     : 449
Background Eff      : .931
Sample Aliquot      : 1 swipe(s)

Gross Beta MDA = 1.51E+01 dpm/swipe
Gross Beta CL  = 7.25E+00 dpm/swipe

Beta Sys. Error     : 6.3%
Beta Efficiency     : 0.9314 - exp(-0.031*tSIE^0.9041)

Flag Description:

>CL : Result > 2-sigma Error  and  Result > Critical Level.
<CL : Result < 2-sigma Error  and  Result < Critical Level.
@CL : Result < 2-sigma Error  and  Result > Critical Level.
@CL : Result > 2-sigma Error  and  Result < Critical Level.
ERR : Efficiency <= 0.
```

COPY

RPSD ID	Client ID	volume	cpm	Error	tSIE	Eff	Gross Beta dpm/swipe	Activi 2s Err
001	1	1.00E+00	4.60E+01	6.07E+00	436	0.931	4.30E+00	1.30E+
002	2	1.00E+00	4.46E+01	5.97E+00	431	0.931	2.79E+00	1.28E+
003	3	1.00E+00	4.08E+01	5.71E+00	433	0.931	-1.29E+00	1.24E+
004	4	1.00E+00	4.26E+01	5.84E+00	431	0.931	6.45E-01	1.25E+
005	5	1.00E+00	4.16E+01	5.77E+00	441	0.931	-4.30E-01	1.25E+
006	6	1.00E+00	4.32E+01	5.88E+00	434	0.931	1.29E+00	1.26E+
007	7	1.00E+00	4.36E+01	5.91E+00	435	0.931	1.72E+00	1.27E+
008	8	1.00E+00	4.36E+01	5.91E+00	437	0.931	1.72E+00	1.27E+
009	9	1.00E+00	4.50E+01	6.00E+00	432	0.931	3.22E+00	1.29E+
010	10	1.00E+00	3.78E+01	5.50E+00	437	0.931	-4.51E+00	1.24E+

ANNEX D
Surface-Water Site Assessment for SWMUs 8 and 58

SURFACE WATER SITE ASSESSMENT Part B (3 pages)

Site Information:

1a) Site # 8 1b) Building # (if applicable) N/A 1c) OU # 1332

2. Date/Time (M/D/Y H:M, 24Hr) 9/8/98 10:30

Site Setting:

3a) ◯ On Alluvial Plain.

3b) ◯ Within a bench of an arroyo or drainage basin

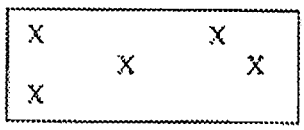
3c) ☑ In canyon floor/drainage basin, but not in an established channel.

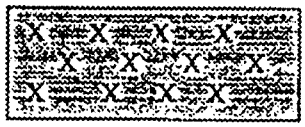
3d) ◯ Within established arroyo channel/drainage basin

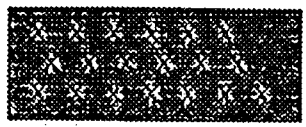
Explanation: Unnamed arroyo borders site. Minor arroyo flow throughout.

4. Estimated ground and / or canopy cover at the site: (deciduous leaves, pine needles, vegetation, trees, rocks)

Estimated percent of ground cover:

a) 

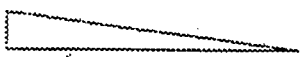
b) 

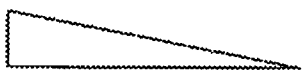
c) 

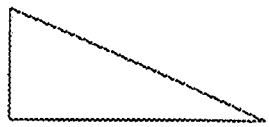
◯ 0-25% cover ◯ 25-75% cover ☑ 75-100% cover

Explanation: Desert Vegetation

5. Steepest slope at the area impacted:

a) 

b) 

c) 

☑ less than 10% ◯ 10 to 30% ◯ 30% or greater

Explanation:

Runoff Factors:

Y / N

☑ ☐ 6) Is there visible evidence of runoff discharging from the site? If yes, answer a) – c) below:

☑ ☐ 6a) Is runoff channelized? If yes, describe. ☐ Man-made channel. ☑ Natural Channel.

6b) Where does evidence of runoff terminate?

Drainage or wetland. (name) Arroyo del Coyote

Within bench of Canyon setting. (name)

Other (retention pond, meadow, mesa top etc)

Explanation: Site arroyo feed Arroyo del Coyote

☑ ☐ 6c) Has runoff caused visible erosion at the site? If yes, explain. ☑ Sheet ☐ Rill ☐ Gully

Explanation: Widespread but limited sheet flows

Run-on Factors:

Rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)

Note: Include comments in appropriate boxes if both natural and man-made run-on exist.

☐ ☑ 7. Are structures creating run-on to the site? (buildings, roof drains, parking lots, storm drains)

Explanation:

☐ ☑ 8. Are current operations adversely impacting run-on to the site? (fire hydrants, NPDES outfalls)

Explanation:

☑ ☐ 9. Are natural drainage patterns directing stormwater onto the site?

Explanation: Canyon drainage

Assessment Finding:

Y / N

○ ✓ 10. Based on the above criteria and the assessment of this site, do soil erosion potentials exist? (refer to erosion potential matrix)

Explanation: Very limited flow

11.

ER SW Representative

Task Leader or Designee

SNL / 6133 / 284-2593
Company / Organization / Phone #

IT Corp 6134 2842575
Company / Organization / Phone #

Initials of Independent Reviewer. ☐ Check here when information is entered into database. ☐

Notes Recommendations & Photos. (Please attach photos)

✓ ○ 12a. Is there visible trash / debris on the site?

✓ ○ 12b. Is there visible trash / debris in the watercourse? — very limited

Description of existing BMP's: None current

○ ✓ 13a. Are BMP's being properly maintained? (If no, describe in "Other Internal Notes") N/A

○ ✓ 13b. Are BMP's effectively keeping sediment in place and reducing erosion potential? N/A

Recommended BMP's for this site: None required

Other Internal Notes:

Surface Water Site Assessment Erosion Matrix Sheet

SWMU / IRP # 8

CRITERIA EVALUATED	Value	Erosion / Sediment transport Potential Factor Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43 point max.)					
On Mesa top or hill top	1	No Multiplying Factor Defined Based on Topgraphic Setting			
Within bench of canyon/drainage basin	4				
Within canyon floodplain or drainage basin, but not in watercourse	13				13
Within canyon bottom or drainage basin and in watercourse	17				
Estimated % ground and canopy cover	13	> 75 %	25 - 75 %	< 25 %	1.3
Slope at area impacted	13	0 - 10 %	10 - 30 %	> 30 %	1.3
Surface Water Run-off Factors (46 point max.)				**Run-off Section Total**	26.2
Visible evidence of runoff discharge? (Y/N)	5	If NO, Score 0 for Run-off Section. If YES, Score 5 and Complete Section.			5
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	19
Has runoff caused visible erosion? (Y/N)	22	Sheet	Rill	Gully	2.2
		If NO, Score as 0. If YES, Caculate and Record Value.			
Surface Water Run-on Factors (11 point max.)				**Run-on Section Total**	14.2
Do structures adversely affect run-on?* (Y/N)	7	If YES, Score as 7. If NO, Score as 0.			
Does natural drainage adversely affect site run-on?* (Y/N)	7	If YES, Score as 7. If NO, Score as 0.			7
Do current operations adversely impact site run-on? (Y/N)	4	If YES, Score as 4. If NO, Score as 0.			
* Select either structures OR natural drainage.					
MAX. POSSIBLE EROSION MATRIX SCORE:	100	Score: < 40 = low erosion potential 40 - 60 = moderate erosion potential > 60 = high erosion potential		Total Score	40.2

SURFACE WATER SITE ASSESSMENT Part B (3 pages)

Site Information:

1a) Site # 58 1b) Building # (if applicable) N/A 1c) OU # 1332

2. Date/Time (M/D/Y H:M, 24Hr) 9/8/98 11:15

Site Setting:

3a) ◯ On Alluvial Plain.

3b) ◯ Within a bench of an arroyo or drainage basin

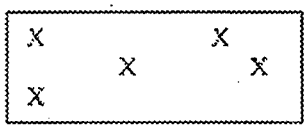
3c) ☑ In canyon floor/drainage basin, but not in an established channel.

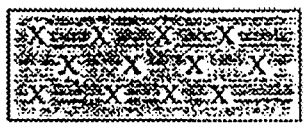
3d) ◯ Within established arroyo channel/drainage basin

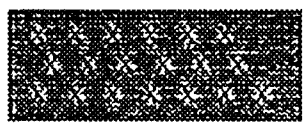
Explanation: unnamed arroyo on western boundary (see SWB) – arroyo outside eastern boundary

4. Estimated ground and / or canopy cover at the site: (deciduous leaves, pine needles, vegetation, trees, rocks)

Estimated percent of ground cover:

a) 

b) 

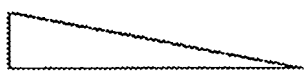
c) 

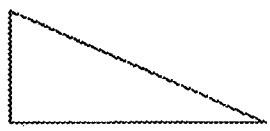
◯ 0-25% cover ☑ 25-75% cover ◯ 75-100% cover

Explanation: Some cleared areas

5. Steepest slope at the area impacted:

a)

b) 

c) 

☑ less than 10% ◯ 10 to 30% ◯ 30% or greater

Explanation:

SURFACE WATER SITE ASSESSMENT Part B (3 pages)

Runoff Factors:

Y / N

☑ ☐ 6) Is there visible evidence of runoff discharging from the site? If yes, answer a) – c) below: (5 to 8)

☑ ☐ 6a) Is runoff channelized? If yes, describe. ☐ Man-made channel. ☑ Natural Channel.

6b) Where does evidence of runoff terminate?

Drainage or wetland. (name): Arroyo del Coyote

Within bench of Canyon setting. (name):

Other (retention pond, meadow, mesa top etc):

Explanation: — runoff continues to western side of site to (5 to 8) and access road

☑ ☐ 6c) Has runoff caused visible erosion at the site? If yes, explain. ☑ Sheet ☐ Rill ☐ Gully

Explanation: 5 to 8 portion

Run-on Factors:

Rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)

Note: Include comments in appropriate boxes if both natural and man-made run-on exist.

☐ ☑ 7. Are structures creating run-on to the site? (buildings, roof drains, parking lots, storm drains)

Explanation:

☐ ☑ 8. Are current operations adversely impacting run-on to the site? (fire hydrants, NPDES outfalls)

Explanation:

☑ ☐ 9. Are natural drainage patterns directing stormwater onto the site?

Explanation: Same as site 8

SURFACE WATER SITE ASSESSMENT — Part B (3 pages)

Assessment Finding:

Y / N

( ) (✓) 10. Based on the above criteria and the assessment of this site, do soil erosion potentials exist? (refer to erosion potential matrix)

Explanation:

11.

ER/SW Representative

SNL / 6133 / 284-2573
Company / Organization / Phone #

Task Leader or Designee

IT Corp 6134 2847525
Company / Organization / Phone #

Initials of Independent Reviewer. [ ] Check here when information is entered into database. [ ]

Notes Recommendations & Photos. (Please attach photos)

(✓) ( ) 12a. Is there visible trash / debris on the site?

(✓) ( ) 12b. Is there visible trash / debris in the watercourse? (Site 8)

Description of existing BMP's: N/A

( ) (✓) 13a. Are BMP's being properly maintained? (If no, describe in "Other Internal Notes") N/A

( ) (✓) 13b. Are BMP's effectively keeping sediment in place and reducing erosion potential? N/A

Recommended BMP's for this site: None required

Other Internal Notes: Majority of flow/erosion would occur @ Site 8

Surface Water Site Assessment Erosion Matrix Sheet

SWMU / IRP # 58

CRITERIA EVALUATED	Value	Erosion / Sediment transport Potential Factor Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43 point max.)					
On Mesa top or hill top	1	No Multiplying Factor Defined Based on Topgraphic Setting			
Within bench of canyon/drainage basin	4				
Within canyon floodplain or drainage basin, but not in watercourse	13				13
Within canyon bottom or drainage basin and in watercourse	17				
Estimated % ground and canopy cover	13	> 75 %	25 - 75 %	< 25 %	6.5
Slope at area impacted	13	0 - 10 %	10 - 30 %	> 30 %	1.3
Surface Water Run-off Factors (46 point max.)				**Section Total**	20.8
Visible evidence of runoff discharge? (Y/N)	5	If NO, Score 0 for Run-off Section. If YES, Score 5 and Complete Section.			5
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	19
Has runoff caused visible erosion? (Y/N)	22	Sheet	Rill	Gully	2.2
		If NO, Score as 0. If YES, Caculate and Record Value.			
Surface Water Run-on Factors (11 point max.)				**Section Total**	14.2
Do structures adversely affect run-on?* (Y/N)	7	If YES, Score as 7. If NO, Score as 0.			
Does natural drainage adversely affect site run-on?* (Y/N)	7	If YES, Score as 7. If NO, Score as 0.			7
Do current operations adversely impact site run-on? (Y/N)	4	If YES, Score as 4. If NO, Score as 0.			
* Select either structures OR natural drainage.					
MAX. POSSIBLE EROSION MATRIX SCORE:	100	Score: < 40 = low erosion potential 40 - 60 = moderate erosion potential > 60 = high erosion potential		Total Score	57

Sandia National Laboratories

Justification for Class III Permit Modification

January 2008

SWMUs 8 And 58
Operable Unit 1332
Canyons Blast Area
Volume 4 of 4

CAC (Vols.1-3) Submitted April 2005
RSI Response Submitted March 2006
NOD Response Submitted January 2007

Environmental
Restoration
Project

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

National Nuclear Security Administration
Sandia Site Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400

Ltr to: 370443

MAR 1 0 2006

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

cc: Records Center

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Road East, Building 1
Santa Fe, NM 87505

Dear Mr. Bearzi,

On behalf of the Department of Energy (DOE) and Sandia Corporation, DOE is submitting the Supplemental Response and Proposal for Corrective Action Complete, Solid Waste Management Units 8 and 58, Foothills Test Area, March 2006, in response to NMED's June 6, 2005 Request for Supplemental Information on the Corrective Action Complete Proposal for Solid Waste Management Units 8 & 58, Foothills Test Area, April 2005, Sandia National Laboratories, New Mexico, EPA ID No. NM589011518, HWB-SNL-05-013.

If you have any questions, please contact me at (505)845-6036, or John Gould at (505) 845-6089.

Sincerely,

Kimberly A. Davis for

Patty Wagner
Manager

Enclosure

cc w/ enclosure:
W. Moats, NMED-HWB (via Certified Mail)
L. King, EPA, Region 6 (Via Certified Mail)
J. Volkerding, DOE-NMED-OB (2 copies)

Sandia National Laboratories/New Mexico Environmental Restoration Project

SUPPLEMENTAL RESPONSE AND PROPOSAL FOR CORRECTIVE ACTION COMPLETE SOLID WASTE MANAGEMENT UNITS 8 AND 58, FOOTHILLS TEST AREA

March 2006

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

TABLE OF CONTENTS

LIST OF FIGURES iii
LIST OF TABLES v
LIST OF ANNEXES ix
ACRONYMS AND ABBREVIATIONS xi

1.0 INTRODUCTION 1-1

2.0 FEATURE 58O BURN PIT SOIL SAMPLING 2-1

2.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005) 2-1
2.2 Feature 58O Burn Pit Soil Sample Collection and Analytical Results 2-1
2.3 Feature 58O Burn Pit Soil Sampling Results and Conclusions 2-9

3.0 FEATURE 58S BLAST POINT SOIL SAMPLING 3-1

3.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005) 3-1
3.2 Feature 58S Blast Point Soil Sample Collection and Analytical Results 3-1
3.3 Feature 58S Soil Sampling Results and Conclusions 3-1

4.0 FEATURE 58X BLAST POINT SOIL SAMPLING 4-1

4.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005) 4-1
4.2 Feature 58X Blast Point Soil Sample Collection and Analytical Results 4-1
4.3 Feature 58X Blast Point Soil Sampling Results and Conclusions 4-1

5.0 FEATURE 58FF FIRE BRICK AREA SOIL SAMPLING 5-1

5.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005) 5-1
5.2 Feature 58FF Fire Brick Area Soil Sample Collection and Analytical Results 5-1
5.3 Feature 58FF Soil Sampling Results and Conclusions 5-19

6.0 FEATURE 58OO OPEN BOREHOLE SOIL SAMPLING 6-1

6.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005) 6-1
6.2 Feature 58OO Open Borehole Soil Sample Collection and Analytical Results 6-1
6.3 Feature 58OO Open Borehole Soil Sampling Results and Conclusions 6-5

TABLE OF CONTENTS (Concluded)

7.0 FEATURE 58TT FIRE BRICK AREA SOIL SAMPLING 7-1

7.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005) 7-1
7.2 Feature 58TT Fire Brick Area Soil Sample Collection and Analytical Results 7-1
7.3 Feature 58TT Fire Brick Area Soil Sampling Results and Conclusions 7-1

8.0 FEATURE 58YY CONCRETE PAD 1 SOIL SAMPLING 8-1

8.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005) 8-1
8.2 Feature 58YY Concrete Pad 1 Soil Sample Collection and Analytical Results 8-1
8.3 Feature 58YY Concrete Pad 1 Soil Sampling Results and Conclusions 8-1

9.0 SOIL SAMPLING QUALITY ASSURANCE/QUALITY CONTROL SAMPLES AND DATA VALIDATION RESULTS 9-1

9.1 Quality Assurance/Quality Control Samples 9-1

9.1.1 Duplicate Samples 9-1
9.1.2 Equipment Blank Samples 9-1

9.2 Data Validation Results 9-3

10.0 SWMUs 8 AND 58 REVISED RISK ASSESSMENT DISCUSSION 10-1

10.1 SWMUs 8 and 58 Combination Area Revised Risk Assessment 10-2
10.2 Feature 58FF Revised Risk Assessment 10-5
10.3 Feature 58TT Revised Risk Assessment 10-7
10.4 Recommendation for Corrective Action Complete Without Controls Determination 10-8

11.0 REFERENCES 11-1

LIST OF FIGURES

Figure

2.2-1 Features at SWMUs 8 and 58 Requiring Further Investigation 2-3

2.2-2 Soil Sample Locations at Feature 58O Burn Pit, SWMU 58, Coyote Canyon Blast Area 2-5

3.2-1 Soil Sample Locations at Feature 58S Blast Point, SWMU 58, Coyote Canyon Blast Area 3-3

4.2-1 Soil Sample Locations at Feature 58X Blast Point, SWMU 58, Coyote Canyon Blast Area 4-3

5.2-1 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area 5-3

5.2-2 Collecting cuttings and soil from the drilling rig cyclone with a plastic bucket during the drilling of Borehole 58FF-GR-BH13. View to the northeast, October 23, 2005. 5-7

5.2-3 Processing soil collected from Borehole 58FF-GR-BH13 through a brass screen to remove oversized material. Power lines that traverse the Feature 58FF site can be seen behind the drilling rig. View to the southeast, October 23, 2005. 5-9

6.3-1 Side view of a 7.5-centimeter-wide fragment of the iron oxide-impregnated and stained granitic bedrock from 71 feet bgs in Borehole 58OO-GR. A small (2 millimeter) barite crystal in a cavity in the upper right side of the fragment is circled and is also shown in Figure 6.3-2. 6-9

6.3-2 Photomicrograph of the 2-millimeter euhedral barite crystal in a cavity, contained in the circled area of the rock fragment shown in Figure 6.3-1. 6-11

6.3-3 General Geologic Map of the SWMU 8 and 58 Area 6-15

7.2-1 Soil Sample Locations at Feature 58TT Fire Brick Area No. 2, SWMU 58, Coyote Canyon Blast Area 7-3

8.2-1 Soil Sample Locations at Feature 58YY Concrete Pad No. 1, SWMU 58, Coyote Canyon Blast Area 8-3

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LIST OF TABLES

Table

2.2-1 Summary of Confirmatory Soil Sampling, Feature 58O Burn Pit at SWMU 58, Coyote Canyon Blast Area, Barium and Zinc Analytical Results, April 1996, December 1997, and September 2005 (On- and Off-Site Laboratories)..... 2-7

2.2-2 Confirmatory Soil Sampling, Feature 58O Burn Pit at SWMU 58, Coyote Canyon Blast Area, Metals Analytical MDLs, September 2005 (Off-Site Laboratory) 2-9

3.2-1 Summary of Confirmatory Soil Sampling, Feature 58S Blast Point at SWMU 58, Coyote Canyon Blast Area, HE Compound Analytical Results, October 1997 and September 2005 (Off-Site Laboratories) 3-5

3.2-2 Confirmatory Soil Sampling, Feature 58S Blast Point at SWMU 58, Coyote Canyon Blast Area, HE Compound Analytical MDLs, September 2005 (Off-Site Laboratory) 3-6

4.2-1 Summary of Confirmatory Soil Sampling, Feature 58X Blast Point at SWMU 58, Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical Results, May 1996 and September 2005 (On- and Off-Site Laboratories)..... 4-5

4.2-2 Confirmatory Soil Sampling, Feature 58X Blast Point at SWMU 58, Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical MDLs and MDAs, September 2005 (Off-Site Laboratory)..... 4-7

5.2-1 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH8 at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results, October 2005 (Off-Site Laboratory).....5-11

5.2-2 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH9 at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results, October 2005 (Off-Site Laboratory).....5-12

5.2-3 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH10 at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results, October 2005 (Off-Site Laboratory).....5-13

5.2-4 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH11 at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results, October 2005 (Off-Site Laboratory).....5-14

LIST OF TABLES (Continued)

Table

5.2-5 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH12 at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results, October 2005 (Off-Site Laboratory).....5-15

5.2-6 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH13 at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results, October 2005 (Off-Site Laboratory).....5-16

5.2-7 Summary of Confirmatory Soil Sampling, Boreholes S58-BH4 and 58FF-GR-FF at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results, April 1997 and October 2005 (Off-Site Laboratory) 5-17

5.2-8 Summary of Confirmatory Soil Sampling, Boreholes S58-BH1 and 58FFC-BH-001 at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results, April 1997 and October 2005 (Off-Site Laboratory) 5-18

5.2-9 Confirmatory Soil Sampling, Boreholes 58FF-GR-BH8 through 58FF-GR-BH13, 58FF-GR-FF, and 58FFC-BH-001 at Feature 58FF Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical MDLs, October 2005 (Off-Site Laboratory).....5-19

6.2-1 Summary of Confirmatory Soil Sampling, Borehole 58OO-GR at Feature 58OO, The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area), Metals Analytical Results, October 2005 (Off-Site Laboratory) 6-2

6.2-2 Confirmatory Soil Sampling, Borehole 58OO-GR at Feature 58OO, The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area), Metals Analytical MDLs, October 2005 (Off-Site Laboratory)..... 6-3

6.2-3 Summary of Confirmatory Soil Sampling, Borehole 58OO-GR at Feature 58OO, The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area), Gamma Spectroscopy Analytical Results, October 2005 (Off-Site Laboratory)..... 6-4

6.3-1 Summary of Metals Concentrations in the Bedrock Sample from Borehole 58OO-GR at Feature 58OO, The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area), October 2005 (Off-Site Laboratory)..... 6-6

LIST OF TABLES (Continued)

Table

6.3-2 Metals Concentrations in the Bedrock Sample from Borehole 58OO-GR at Feature 58OO, The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area), Metals Analytical MDLs, October 2005 (Off-Site Laboratory) 6-7

7.2-1 Summary of Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Lead Analytical Results, March 1999 and September 2005 (Off-Site Laboratory) 7-5

7.2-2 Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Lead Analytical MDLs, September 2005 (Off-Site Laboratory) 7-6

7.2-3 Summary of Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical Results, March 1999 and September 2005 (On- and Off-Site Laboratories)..... 7-7

7.2-4 Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical MDLs, September 2005 (Off-Site Laboratory) 7-9

8.2-1 Summary of Confirmatory Soil Sampling, Feature 58YY Concrete Pad 1 at SWMU 58, Coyote Canyon Blast Area, Gamma Spectroscopy Analytical Results, January 1999 and October 2005 (Off-Site Laboratory)..... 8-5

8.2-2 Summary of Confirmatory Soil Sampling, Feature 58YY Concrete Pad 1 at SWMU 58, Coyote Canyon Blast Area, Lead Analytical Results, January 1999 and September 2005 (Off-Site Laboratory)..... 8-6

8.2-3 Confirmatory Soil Sampling, Feature 58YY Concrete Pad 1 at SWMU 58, Coyote Canyon Blast Area, Lead Analytical MDLs, September 2005 (Off-Site Laboratory) 8-7

9.1-1 Summary of SWMUs 8 and 58 Field Duplicate Relative Percent Difference Values for Metals Analyses of Confirmatory Soil Samples Collected in September and October 2005 (Off-Site Laboratory) 9-2

10.1-1 Risk Assessment Values for Nonradiological COCs, SWMUs 8 and 58 Combination Area 10-3

LIST OF TABLES (Concluded)

Table

10.2-1 Risk Assessment Values for SWMU 58 Nonradiological COCs, Feature 58FF Fire Brick Area....10-6

10.3-1 Risk Assessment Values for SWMU 58 Nonradiological Background Constituents, Feature 58TT Fire Brick Area....10-7

LIST OF ANNEXES

Annex

A SWMUs 8 and 58 Complete Analytical Reports, Radionuclides by Gamma Spectroscopy for Samples Collected from Features 58OO and 58YY, September and October 2005

B SWMUs 8 and 58 Soil Sample Data Validation Reports, September and October 2005

C SWMUs 8 and 58 Calculation of the Upper Confidence Limits of Mean Concentrations

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ACRONYMS AND ABBREVIATIONS

AOP	Administrative Operating Procedure
bgs	below ground surface
CAC	Corrective Action Complete
COC	constituent of concern
DOE	U.S. Department of Energy
EB	equipment blank
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
GEL	General Engineering Laboratories, Inc.
HE	high explosive(s)
HI	hazard index
HWB	Hazardous Waste Bureau
kg	kilogram(s)
MDA	minimum detectable activity
MDL	method detection limit
mg	milligram(s)
NMED	New Mexico Environment Department
QA	quality assurance
QC	quality control
RME	reasonable maximum exposure
RPD	relative percent difference
RSI	Request for Supplemental Information
SAP	Sampling and Analysis Plan
SNL/NM	Sandia National Laboratories/New Mexico
SWMU	Solid Waste Management Unit
UCL	upper confidence limit

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1.0 INTRODUCTION

Environmental surveys, remedial actions to remove surface debris, and environmental sampling were conducted at Solid Waste Management Units (SWMUs) 8 and 58 from 1996 to 2004. The results of environmental work conducted at the sites were summarized and compiled in the "Sandia National Laboratories Environmental Restoration Project Corrective Action Complete [CAC] Proposal, Solid Waste Management Unit 8, Open Dump (Coyote Canyon Blast Area) and Solid Waste Management Unit 58, Coyote Canyon Blast Area, Foothills Test Area" (SNL/NM April 2005). This CAC proposal was submitted to the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) in April 2005. The CAC proposal was reviewed by the NMED, which resulted in a June 6, 2005, Request for Supplemental Information (RSI) letter from William P. Moats (NMED HWB) to the U.S. Department of Energy (DOE) and Sandia National Laboratories/New Mexico (SNL/NM) (NMED June 2005). This RSI letter indicated that data gaps remained at the two sites and additional surface and subsurface soil sampling were required to define the extent of contamination at SWMUs 8 and 58.

Following receipt by SNL/NM of the NMED June 2005 RSI, a meeting to discuss and clarify the additional sampling needs at these sites was held between SNL/NM Environmental Restoration (ER) Project personnel (Brenda Langkopf, Edward Mignardot, and Dwight Stockham) and an NMED HWB representative (Brian Salem) on June 22, 2005. Once the sampling issues were clarified, a detailed Sampling and Analysis Plan (SAP) that described the additional sampling to be conducted at the site by SNL/NM was submitted to the NMED in August 2005 (SNL/NM August 2005). The NMED reviewed and approved the procedures described in the SAP, and stated in the notice of approval dated September 13, 2005, that the proposed work described in the SAP was acceptable (NMED September 2005). The NMED also required that the results of the approved field sampling be provided to them within 90 days of receipt of the approval letter, or by December 14, 2005. The field sampling was conducted at the site in September and October 2005. SNL/NM recognized that meeting the December 14, 2005, deadline for submittal of the additional investigation results would not be possible as more time would be required to compile, summarize, and evaluate the sampling results. Therefore, the DOE and SNL/NM formally requested a 90-day extension to the RSI response deadline, submitting the response to the NMED by March 14, 2006 (Wagner December 2005).

This document presents the results of additional surface and subsurface soil sampling conducted at SWMUs 8 and 58, Foothills Test Area in September and October 2005, structured in the following manner. The NMED comments contained in the June 6, 2005, RSI letter (in bold font) are restated in exactly the same wording and the same order provided in the RSI, as shown by the number immediately preceding the comment. Following each NMED comment, the word "Response" describes the proposed additional field sampling that was agreed upon by both the NMED and SNL/NM and that was provided in the SAP submitted to and approved by the NMED in August and September 2005, respectively (SNL/NM August 2005, NMED September 2005). Following the "Response," the actual sampling conducted by SNL/NM in September and October 2005, and the analytical results of that sampling are presented. Finally, the results of the sampling performed at each of the SWMU 8 and 58 features are evaluated and discussed.

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2.0 FEATURE 58O BURN PIT SOIL SAMPLING

2.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005)

1. Feature 58O Burn Pit:

Soil sample results from the borehole at Feature 58O had estimated concentrations for barium and detection limits for nickel significantly above background limits. A new borehole should be advanced with samples analyzed for barium and nickel. Analytical detection limits should not exceed background levels.

Response: A new borehole will be advanced approximately 2 ft from the original borehole location. Three soil samples will be collected at 5, 10, and 15 ft depths, and analyzed for barium only. The surface sample had a high MDL for zinc; a surface sample will be collected at the new location and analyzed for zinc only. We are not sure why NMED requested reanalysis for nickel. Nickel was not elevated in any sample collected from the original borehole. Therefore, no additional characterization for nickel will be performed. A Sampling and Analysis Plan (SAP) was prepared to address the additional sampling activities, and is included as an attachment to this response.

2.2 Feature 58O Burn Pit Soil Sample Collection and Analytical Results

The location of Feature 58O is shown in Figure 2.2-1. On September 12, 2005, one primary and one duplicate surface and two subsurface (5- and 10-foot depth) soil samples were collected from a new borehole, 58O-GR-100, located 2 feet east of the original borehole, 58O-GR-0 (Figure 2.2-2). These samples were collected from Borehole 58O-GR-100 using a small auger drilling machine and a split-spoon sampler. However, auger and split-spoon sampler refusal due to rocky subsurface conditions at this location prevented collection of the 15-foot-depth sample. This issue was discussed with Brian Salem of the NMED, and he verbally agreed that the 15-foot sample would not be required (Mignardot December 2005). The two surface soil samples were analyzed for zinc, and the two subsurface soil samples were analyzed for barium by General Engineering Laboratories, Inc. (GEL). The analytical results for all barium and zinc samples collected at Feature 58O from April 1996 through September 2005 are presented in Table 2.2-1. The method detection limits (MDLs) for the September 2005 analyses (which did not exceed the NMED-approved background levels) are presented in Table 2.2-2.

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434000 435000 436000 437000

1460000 1459000 1458000 1457000 1456000

SWMU 58

SWMU 8

6110 6340 6030 5960 5930 6020 5890 5900

58X 58YY 58S 58O 58FF 58OO 58TT

Legend

Features 58FF, 58O, 58S, and 58X
(symbol shows radial sampling pattern at these four sites)

Feature 58OO, 58TT, and 58YY

10 Foot Contour

KAFB Boundary

Unpaved Road

SWMUs 8 & 58 Boundary

0 500 1000
Scale in Feet

0 120 240
Scale in Meters

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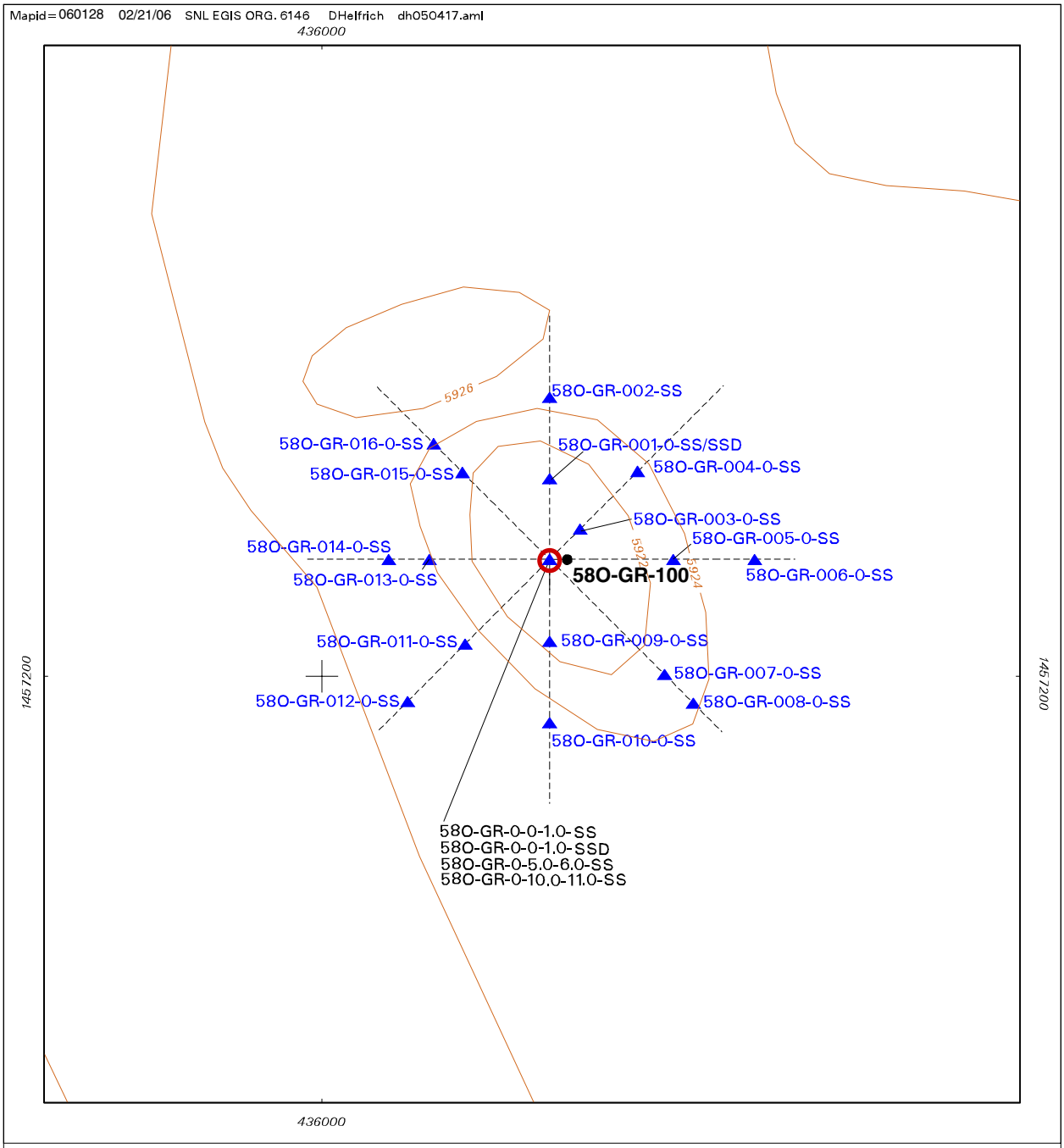
Figure 2.2-1
Features at SWMUs 8 and 58 Requiring Further Investigation

Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone
1927 North American Horizontal Datum, 1929 North American Vertical Datum

Unclassified	MAPID= mb060113	SNL GIS ORG. 6146
D.Helfrich	dh050424.aml	07/19/05



Legend

- April 1996 - December 1997 Randomly Selected Surface Sample Location
- April 1996 Borehole Sample Location and Surface Sample Location
- September 2005 Borehole Sample Location **(in bold font)**
- Radial Sampling Grid Line
- 2 Foot Contour

Figure 2.2-2
Soil Sample Locations at Feature 58O Burn Pit, SWMU 58, Coyote Canyon Blast Area

0 10 20
Scale In Feet

0 2.4 4.8
Scale In Meters

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Environmental Geographic Information System

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Table 2.2-1
Summary of Confirmatory Soil Sampling, Feature 58O Burn Pit at SWMU 58
Coyote Canyon Blast Area, Barium and Zinc Analytical Results
April 1996, December 1997, and September 2005
(On- and Off-Site Laboratories)

Sample Attributes			Metals (EPA Method 6010 [1996 and 1997 samples] and 3005/3050 [2005 samples])[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Barium	Zinc
April 1996 Soil Samples				
05115	58O-GR-0-0-1.0-SS	0–1.0	**437 J**	**ND (265)**
05115	58O-GR-0-0-1.0-SSD	0–1.0	**465 J**	**ND (265)**
05115	58O-GR-0-5.0-6.0-SS	5.0–6.0	**988 J**	5.08
05115	58O-GR-0-10.0-11.0-SS	10.0–11.0	98.4 J	16.70
April 1996 and December 1997 Soil Samples				
510119	58O-GR-001-0-SS	0–0.5	134	38.9
510119	58O-GR-001-0-SSD	0–0.5	110	34.7
510119	58O-GR-002-0-SS	0–0.5	92.1	31.3
510119	58O-GR-003-0-SS	0–0.5	139	**71.8**
05127	58O-GR-004-0-SS	0–0.5	141	46.8
04960	58O-GR-005-0-SS	0–0.5	190	30 J (38)
04960	58O-GR-006-0-SS	0–0.5	150	38
04960	58O-GR-007-0-SS	0–0.5	180	33 J (38)
510119	58O-GR-008-0-SS	0–0.5	51.8	31.7
05127	58O-GR-008-0-SS	0–0.5	NR	23.6
510119	58O-GR-009-0-SS	0–0.5	118	**56.2**
04960	58O-GR-010-0-SS	0–0.5	130	38
04960	58O-GR-011-0-SS	0–0.5	110	44
510119	58O-GR-012-0-SS	0–0.5	166	33.8
05127	58O-GR-012-0-SS	0–0.5	NR	28.6
04960	58O-GR-013-0-SS	0–0.5	110	26 J (38)
04960	58O-GR-014-0-SS	0–0.5	120	27 J (38)
04960	58O-GR-015-0-SS	0–0.5	120	38
05127	58O-GR-016-0-SS	0–0.5	98.4 J	28.5
September 2005 Soil Samples				
608867	58O-GR-100-0-SS	0	NR	**68.4**
608867	58O-GR-100-0-SD	0	NR	**61**
608867	58O-GR-100-5-S	5	**621 J**	NR
608867	58O-GR-100-10-S	10	115 J	NR
Background Concentration—Canyons Area[c]			246	52.1
September 2005 Quality Assurance/Quality Control Sample (mg/L)				
608867	58O-GR-100-0-EB		0.0013 J (0.002)	0.00833 J (0.01)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.

Table 2.2-1 (Concluded)
Summary of Confirmatory Soil Sampling, Feature 58O Burn Pit at SWMU 58
Coyote Canyon Blast Area, Barium and Zinc Analytical Results
April 1996, December 1997, and September 2005
(On- and Off-Site Laboratories)

MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected, but the MDL (shown in parentheses) exceeds the background concentration.
NR = Not reported. Sample was not analyzed for this analyte.
S = Soil sample.
SD = Sample duplicate.
SS = Surface sample.
SSD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2.2-2
Confirmatory Soil Sampling, Feature 58O Burn Pit at SWMU 58
Coyote Canyon Blast Area, Metals Analytical MDLs
September 2005
(Off-Site Laboratory)

Analyte	EPA Method 3005/3050[a] Detection Limit (mg/kg)
Barium	0.0994–0.1
Zinc	0.392–0.398

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.

2.3 Feature 58O Burn Pit Soil Sampling Results and Conclusions

As shown in Table 2.2-1, barium concentrations two to three times background were detected in a primary and duplicate surface soil sample, and in a 5-foot-deep sample from the center of the burn pit in April 1996. Barium concentrations were less then background in 18 additional 1996 and 1997 surface samples. Zinc was detected at concentrations slightly above background in two surface soil samples collected from two locations (58O-GR-003 and 58O-GR-009) in the bottom of the burn pit in December 1997. Zinc was also detected at less then background concentrations in 19 additional 1996 and 1997 surface and subsurface soil samples.

The two September 2005 primary and duplicate surface soil samples were analyzed for zinc only, and zinc was again detected at concentrations slightly above background, similar to those found in the two December 1997 samples. The 5- and 10-foot-deep samples were analyzed for barium only. The 5-foot sample contained an estimated barium concentration (621 J milligrams [mg]/kilogram [kg]) similar to that found in the April 1996 5-foot-deep sample (988 J mg/kg). The 10-foot-deep sample contained a below-background estimated barium concentration of 115 J mg/kg, which suggests that the above-background barium concentrations are limited to surface or near-surface soil and do not persist at depth. The barium and zinc samples collected in 1996, 1997, and 2005 indicate that these two metals are not significant or widespread constituents of concern (COCs) at Feature 58O.

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3.0 FEATURE 58S BLAST POINT SOIL SAMPLING

3.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005)

2. Feature 58S Blast Point:

Sample results from Location 58S-005 documented the presence of trinitrotoluene (TNT) at levels approaching soil-screening levels. Adjacent soil samples did not adequately define the extent of contamination at that point, which appears to be a hot spot. Additional sampling and analyses for metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and high explosives (HE) are required to define the extent of contamination.

Response: Three surface soil samples will be collected northeast, southeast, and south of Location ID 58S-005, and will be analyzed for HE only. VOCs, SVOCs and metals are not a contaminant-of-concern (COC) at Feature 58S; therefore, analysis for VOCs, SVOCs and metals will not be performed. A SAP was prepared to address the additional sampling activities, and is included as an attachment to this response.

3.2 Feature 58S Blast Point Soil Sample Collection and Analytical Results

The location of Feature 58S is shown in Figure 2.2-1. On September 12, 2005, a total of three primary and one duplicate surface soil samples were collected from three new surface locations (58S-GR-100, 58S-GR-101, and 58S-GR-102) located 8 feet northeast, 7 feet southeast, and 7.5 feet south, respectively, of Borehole 1332-58S-005 (Figure 3.2-1). The four samples were analyzed for high explosive (HE) compounds by GEL. The analytical results for all HE samples collected from Feature 58S in October 1997 and September 2005 are presented in Table 3.2-1, and the MDLs for the September 2005 analyses are presented in Table 3.2-2.

3.3 Feature 58S Soil Sampling Results and Conclusions

HE compounds were not detected in any of the four additional surface soil samples collected from this site in September 2005. HE compounds have been detected in only one of the 22 surface soil samples collected from Feature 58S in October 1997 and September 2005. This suggests that the single HE compound detection at this site represents a very small localized hot spot, and that significant HE contamination is not present at Feature 58S.

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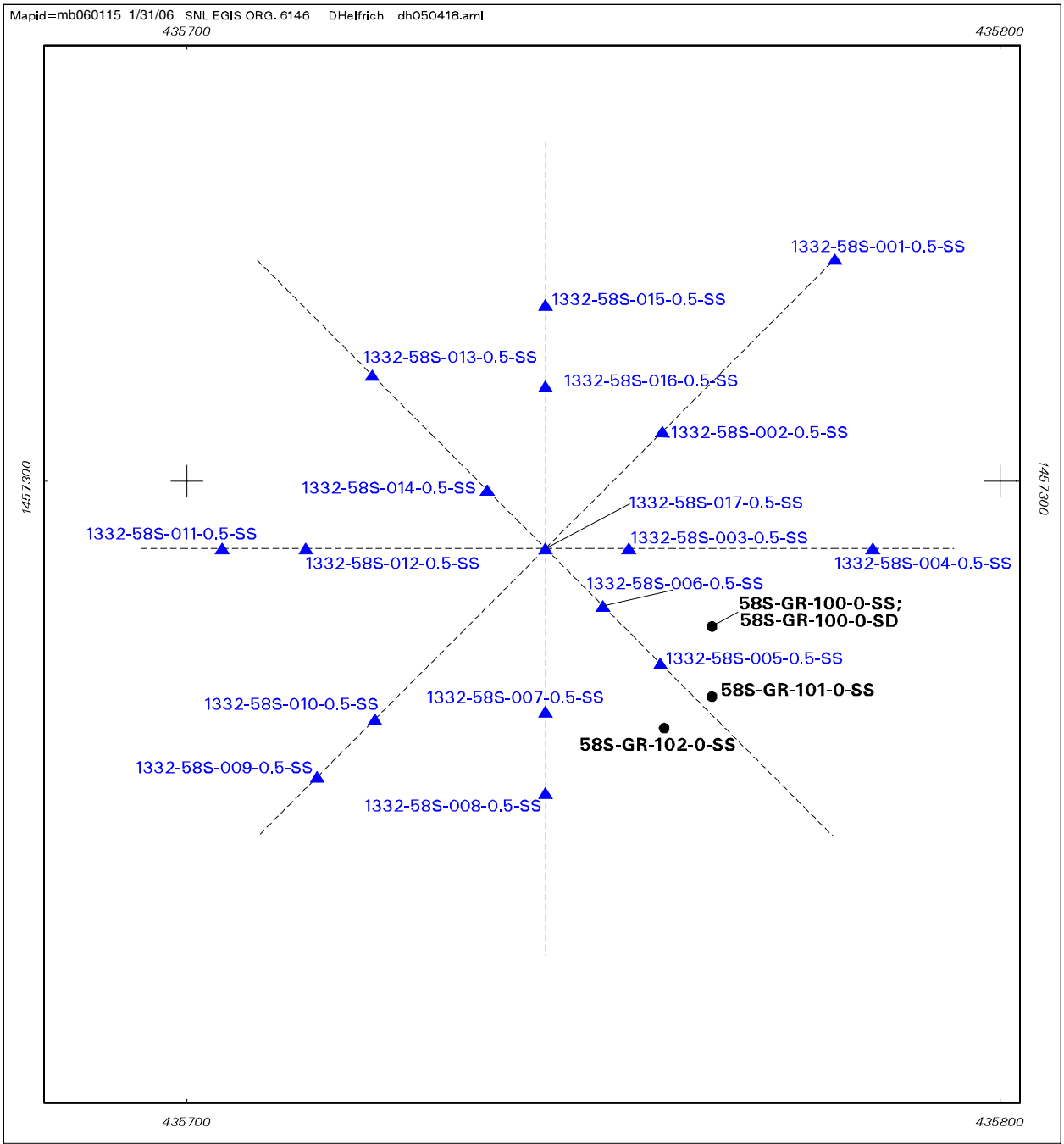

Legend

- October 1997 Randomly Selected Sample Location
- September 2005 Sample Location (in **bold font**)
- Radial Sampling Grid Line

Figure 3.2-1
Soil Sample Locations at Feature 58S Blast Point, SWMU 58, Coyote Canyon Blast Area

0 10 20
Scale In Feet

0 2.4 4.8
Scale In Meters

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Environmental Geographic Information System

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Table 3.2-1
Summary of Confirmatory Soil Sampling, Feature 58S Blast Point at SWMU 58
Coyote Canyon Blast Area, HE Compound Analytical Results
October 1997 and September 2005
(Off-Site Laboratories)

Sample Attributes			HE Compounds (EPA Method 8330[a]) (μg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	4-amino-2,6-Dinitrotoluene	2,4,6-Trinitrotoluene
October 1997 Soil Samples				
06296	1332-58S-001-0.5-SS	0–0.5	ND	ND
06296	1332-58S-002-0.5-SS	0–0.5	ND	ND
06296	1332-58S-003-0.5-SS	0–0.5	ND	ND
06296	1332-58S-004-0.5-SS	0–0.5	ND	ND
06296	1332-58S-005-0.5-SS	0–0.5	**680**	**6,300**
06296	1332-58S-006-0.5-SS	0–0.5	ND	ND
06296	1332-58S-007-0.5-SS	0–0.5	ND	ND
06296	1332-58S-008-0.5-SS	0–0.5	ND	ND
06296	1332-58S-009-0.5-SS	0–0.5	ND	ND
06296	1332-58S-010-0.5-SS	0–0.5	ND	ND
06296	1332-58S-011-0.5-SS	0–0.5	ND	ND
06296	1332-58S-012-0.5-SS	0–0.5	ND	ND
06296	1332-58S-013-0.5-SS	0–0.5	ND	ND
06296	1332-58S-014-0.5-SS	0–0.5	ND	ND
06296	1332-58S-015-0.5-SS	0–0.5	ND	ND
06296	1332-58S-016-0.5-SS	0–0.5	ND	ND
06296	1332-58S-017-0.5-SS	0–0.5	ND	ND
06296	1332-58S-018-0.5-SD[c]	0–0.5	ND	ND
September 2005 Soil Samples				
608868	58S-GR-100-0-SS	0	ND	ND
608868	58S-GR-100-0-SD	0	ND	ND
608868	58S-GR-101-0-SS	0	ND	ND
608868	58S-GR-102-0-SS	0	ND	ND
September 2005 Quality Assurance/Quality Control Sample (μg/L)				
608868	58S-GR-100-0-EB		ND	ND

Note: Values in **bold** represent detected analytes.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]1332-58S-018-0.5-SD was a duplicate of 1332-58S-008-0.5-SS.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HE = High explosive(s).
ID = Identification.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
ND = Not detected.
SD = Sample duplicate.
SS = Surface sample.
SWMU = Solid Waste Management Unit.

Table 3.2-2
Confirmatory Soil Sampling, Feature 58S Blast Point at SWMU 58
Coyote Canyon Blast Area, HE Compound Analytical MDLs
September 2005
(Off-Site Laboratory)

Analyte	EPA Method 8330[a] Detection Limit (μg/kg)
2-Amino-4,6-dinitrotoluene	100
4-Amino-2,6-dinitrotoluene	125
1,3-Dinitrobenzene	50
2,4-Dinitrotoluene	100
2,6-Dinitrotoluene	125
HMX	125
Nitrobenzene	125
2-Nitrotoluene	125
3-Nitrotoluene	125
4-Nitrotoluene	125
RDX	125
Tetryl	125
1,3,5-Trinitrobenzene	125
2,4,6-Trinitrotoluene	125

[a]EPA November 1986.
HE = High explosive(s).
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
Tetryl = Methyl-2,4,6-trinitrophenylmitramine.

4.0 FEATURE 58X BLAST POINT SOIL SAMPLING

4.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005)

3. Feature 58X Blast point:

High activities of uranium-235 and uranium-238 in the soil documented in the report suggest that the extent of soil contamination has not been adequately defined. Additional soil sampling at depths of one to two feet below the ground surface (bgs) is needed to determine the vertical extent of soil contamination. Additionally, the soil samples should be analyzed for metals, VOCs, and SVOCs.

Response: Seven subsurface soil samples will be collected beneath Location IDs 58X-GR-001, 58X-GR-005, 58X-GR-007, 58X-GR-008, 58X-GR-012, 58X-GR-015, and 58X-GR-017. The samples will be collected at 2 ft depths, and will be analyzed for uranium-235, uranium-238, and total uranium by ICP mass spectroscopy. Metals, VOCs or SVOCs are not COCs at Feature 58X; therefore, analysis for metals, VOCs and SVOCs will not be performed. A SAP was prepared to address the additional sampling activities, and is included as an attachment to this response.

4.2 Feature 58X Blast Point Soil Sample Collection and Analytical Results

The location of Feature 58X is shown in Figure 2.2-1. On September 13, 2005, a total of seven primary soil samples and one duplicate were collected from the seven May 1996 sampling locations listed in Section 4.1, and shown in Figure 4.2-1. These samples were all collected at 2-foot depths and analyzed for total uranium, uranium-235, and uranium-238 by the off-site laboratory. The analytical results for all uranium and isotopic uranium samples collected from Feature 58X in May 1996 and September 2005 are presented in Table 4.2-1, and the MDLs and minimum detectable activities (MDAs) for the September 2005 analyses are presented in Table 4.2-2.

4.3 Feature 58X Blast Point Soil Sampling Results and Conclusions

As shown in Table 4.2-1, uranium-235 and uranium-238 activities were above background in most of the 19 surface soil samples collected from Feature 58X in May 1996. For the September 2005 soil samples collected at 2 feet below ground surface (bgs), in all but one location the uranium-235 and uranium-238 activities decreased to below background activity levels with depth. The 2-foot-bgs soil sample from location 58X-GR-107 in the center of Feature 58X had slightly increasing uranium-235 and uranium-238 activities with depth, compared to the surface soil sample, 58X-GR-017 (Table 4.2-1).

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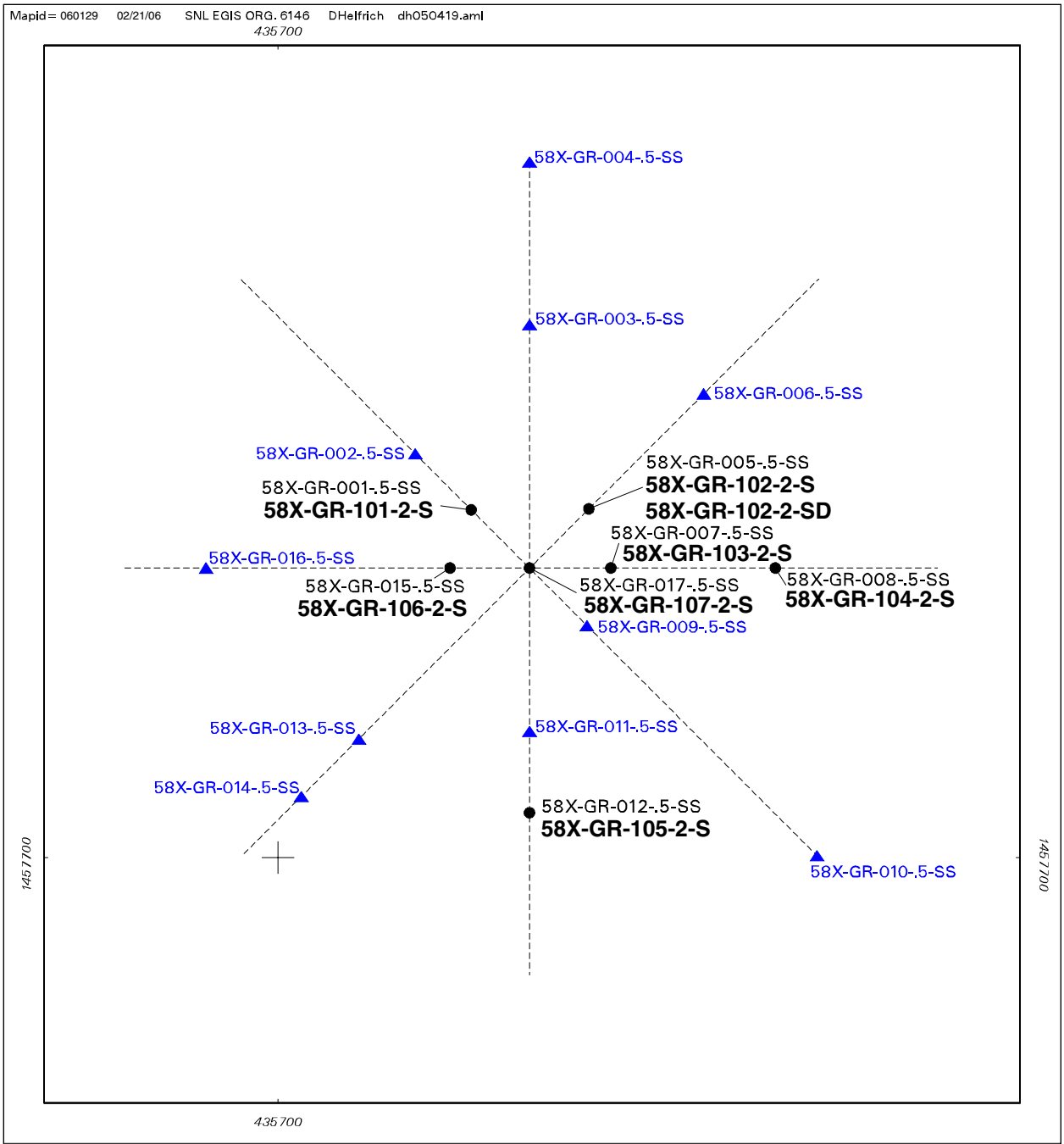

Legend

- ▲ May 1996 Randomly Selected Sample Location
- ● May 1996 and September 2005 (in bold font) Sampling Location
- ---------- Radial Sampling Grid Line

Figure 4.2-1
Soil Sample Locations at Feature 58X Blast Point, SWMU 58, Coyote Canyon Blast Area

0 10 20
Scale In Feet

0 2.4 4.8
Scale In Meters

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Environmental Geographic Information System

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Table 4.2-1
Summary of Confirmatory Soil Sampling, Feature 58X Blast Point at SWMU 58
Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical Results
May 1996 and September 2005
(On- and Off-Site Laboratories)

Sample Attributes			Uranium, Uranium-235, and Uranium-238				
Record Number[a]	ER Sample ID	Sample Depth (ft)	Uranium (mg/kg)	Uranium-235 (pCi/g)		Uranium-238 (pCi/g)	
				Result	Error[b]	Result	Error[b]
May 1996 and September 2005[c] Soil Samples:[d] Uranium-235 and uranium-238 by Gamma Spectroscopy (On-Site Laboratory) and uranium, uranium-235, and uranium-238 by EPA Method 3050 (Off-Site Laboratory), respectively.							
05083	58X-GR-001-0.5-SS	0-0.5	NR	**0.378**	0.196	**6.55**	2.79
608868	**58X-GR-101-2-S**	2	0.746	0.0104 J (0.0303)	NR	0.247	NR
05083	58X-GR-002-0.5-SS	0–0.5	NR	**0.254**	0.0983	**3.94**	3.00
05083	58X-GR-003-0.5-SS	0–0.5	NR	0.144	0.146	**2.95**	2.52
05083	58X-GR-004-0.5-SS	0–0.5	NR	**ND (0.228)**	--	**ND (3.21)**	--
05114	58X-GR-005-0.5.SS	0–0.5	NR	**2.42**	0.411	**46.8**	12.4
05085	58X-GR-005-0.5-SS	0–0.5	NR	**2.21**	0.306	**40.3**	2.82
608868	**58X-GR-102-2-S**	2	1.17	0.0164 J (0.0303)	NR	0.387	NR
608868	**58X-GR-102-2-SD**	2	1.63	0.0227 J (0.0301)	NR	0.539	NR
05083	58X-GR-006-0.5-SS	0–0.5	NR	**0.299**	0.212	**3.16**	2.30
05083	58X-GR-007-0.5-SS	0–0.5	NR	**0.738**	0.185	**13.7**	4.22
608868	**58X-GR-103-2-S**	2	1.01	0.0142 J (0.0301)	NR	0.336	NR
05083	58X-GR-008-0.5-SS	0–0.5	NR	**0.242**	0.175	**8.09**	3.62
608868	**58X-GR-104-2-S**	2	**4.84**	0.0692	NR	1.602	NR
05083	58X-GR-009-0.5-SS	0–0.5	NR	**ND (0.225)**	--	**ND (3.25)**	--
05114	58X-GR-010-0.5-SS	0–0.5	NR	0.115	0.101	2.28	1.07
05083	58X-GR-011-0.5-SS	0–0.5	NR	**0.231**	0.165	**ND (3.96)**	--
05083	58X-GR-012-0.5-SS	0–0.5	NR	**0.271**	0.127	**5.23**	2.41
608868	**58X-GR-105-2-S**	2	0.764	0.0106 J (0.0298)	NR	0.253	NR
05083	58X-GR-013-0.5-SS	0–0.5	NR	**ND (0.229)**	--	**ND (3.25)**	--
05083	58X-GR-014-0.5-SS	0–0.5	NR	**ND (0.217)**	--	**ND (3.21)**	--
05114	58X-GR-015-0.5-SS	0–0.5	NR	**0.823**	0.207	**17.3**	4.72
608868	**58X-GR-106-2-S**	2	1.48	0.0208 J (0.0303)	NR	0.489	NR
05083	58X-GR-016-0.5-SS	0–0.5	NR	**ND (0.247)**	--	**ND (3.48)**	--
05083	58X-GR-017-0.5-SS	0–0.5	NR	**0.589**	0.200	**9.24**	3.52
608868	**58X-GR-107-2-S**	2	**41**	**0.647**	NR	**13.553**	NR
Background Concentration and Activities–North/Tijeras/Southwest/CTF/Off-Site Supergroup Areas for uranium (mg/kg), and Canyons Area for uranium-235 and uranium-238 (pCi/g)[e]			3.42	0.16	NA	2.31	NA

Refer to footnotes at end of table.

Table 4.2-1 (Concluded)
Summary of Confirmatory Soil Sampling, Feature 58X Blast Point at SWMU 58
Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical Results
May 1996 and September 2005
(On- and Off-Site Laboratories)

Note: Values in **bold** exceed background concentrations or activities, or have MDAs that exceed background activities.
[a]Analysis request/chain-of-custody record.
[b]Two standard deviations about the mean activity.
[c]For the September 2005 soil samples, uranium-235 and uranium-238 activities, reported in units of mg/kg by the laboratory, were converted to pCi/g for comparison to pCi/g background activities according to the following conversions: 1 microgram uranium-235 and uranium-238 = 2.163 and 0.333 pCi, respectively (Miller January 2006).
[d]The May 1996 and September 2005 sampling events are combined. The May 1996 samples are surface soil samples. In September 2005, subsurface soil samples were collected at some of the same locations as the May 1996 samples, although assigned different sample identification numbers. For comparison, the September 2005 subsurface samples (sample attributes in **bold**) are listed with the corresponding May 1996 surface soil samples in this table.
[e]Dinwiddie September 1997.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDA but is less than the practical quantitation limit, shown in parentheses.
MDA = Minimum detectable activity.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
ND ( ) = Not detected but the MDA/MDL (shown in parentheses) exceeds the background activity/concentration.
NR = Not reported. Sample not analyzed for this analyte, or not reported by the analytical laboratory.
pCi/g = Picocurie(s) per gram.
S = Soil sample.
SD = Sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 4.2-2
Confirmatory Soil Sampling, Feature 58X Blast Point at SWMU 58
Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical MDLs and MDAs
September 2005
(Off-Site Laboratory)

Analyte	EPA Method 3050[a] Detection Limit
Uranium	0.00984–0.01 (mg/kg)
Uranium-235	0.00426–0.00328 (pCi/g)[b]
Uranium-238	0.00433–0.00333 (pCi/g)[b]

[a]EPA November 1986.
[b]Uranium-235 and uranium-238 activities, reported in units of mg/kg by the laboratory, were converted to pCi/g for comparison to pCi/g background activities according to the following conversions:
1 microgram of uranium-235 and uranium-238 = 2.163 and 0.333 pCi, respectively (Miller January 2006).
EPA = U.S. Environmental Protection Agency.
MDA = Minimum detectable activity.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

The eight September 2005 subsurface soil samples were also analyzed for total uranium, and concentrations were above background in two of the eight samples. Sample 58X-GR-107-2 in the center of Feature 58X (Figure 4.2-1) contained 41 mg/kg of uranium. It also was the only September 2005 soil sample with above-background activities of uranium-235 and uranium-238. Sample 58X-GR-104-2, located 30 feet east of the Feature 58X center, also contained a slightly elevated above-background uranium concentration of 4.84 mg/kg, and uranium-235 and uranium-238 activities were below background in this sample. Surface soil samples collected from Feature 58X in 1996 were not analyzed for total uranium, so it cannot be determined whether uranium concentrations are increasing or decreasing with depth at this site. However, the maximum total uranium concentration found at this site (41 mg/kg) was evaluated in the revised risk assessment for the SWMUs 8 and 58 Combination Area, discussed in Chapter 10.0 of this report.

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5.0 FEATURE 58FF FIRE BRICK AREA SOIL SAMPLING

5.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005)

4. Feature 58FF Fire Brick Area:

Analytical results from most of the soil borings advanced at 58FF documented soil contamination concentrations increasing with depth and therefore, the vertical extent of soil contamination has not been adequately defined. Additional soil borings are needed to determine the vertical extent of soil contamination. In addition, cross-sections depicting the zone of soil contamination should be prepared to properly assess the extent of contamination in the subsurface. Finally, soil sample 58-GR-034 is not located on Figure 4.4.2.3.1-1. The sample exhibited high activities of thorium-232, uranium-235 and uranium-238. Additional surface soil sampling is needed to determine the extent of soil contamination adjacent to this sample.

Response: Six additional boreholes will be advanced to a depth of 100 ft or to bedrock. At each borehole, subsurface samples will be collected at 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, and 100 ft depths. Additionally, two existing boreholes (58FF-GR-FF and 58FFC-BH-001) will be redrilled and advanced to 100 ft or to bedrock, and subsurface samples will be collected at 60, 70, 80, 90, and 100 ft depths. All samples will be analyzed for arsenic, beryllium, lead and nickel (the COCs showing increasing concentrations with depth). A SAP was prepared to address the additional sampling activities, and is included as an attachment to this response.

Two cross-sections (one essentially north-south and the other east-west) depicting the zone of contamination for arsenic, beryllium, lead, and nickel will be prepared to assess the extent of contamination in the subsurface. The cross-sections will be submitted with the results of the SAP fieldwork.

Surface sample 58-GR-034 was collected from the center of the Feature 58FF in 1995. Since then, a radiological VCM was conducted at this site in 1996, and surface soils from the center of the feature were removed. Therefore, additional surface soil sampling will not be performed.

5.2 Feature 58FF Fire Brick Area Soil Sample Collection and Analytical Results

The location of Feature 58FF is shown in Figure 2.2-1. Between October 17 and October 24, 2005, subsurface soil samples were collected from a total of eight 100-foot-deep boreholes. The boring locations are shown in Figure 5.2-1 and were selected and agreed upon by SNL/NM ER Project and NMED personnel. For safety reasons, three of the original borehole locations (58FFC-BH-001, 58FF-GR-BH11, and 58FF-GR-BH12) selected by ER Project and NMED personnel (Brian Salem) at Feature 58FF had to be moved in order to achieve a minimum safe distance of 15 feet between the top of the drilling rig mast and the overhead power lines at the site. Brian Salem also concurred with the adjusted locations for these three boreholes (Mignardot September 2005).

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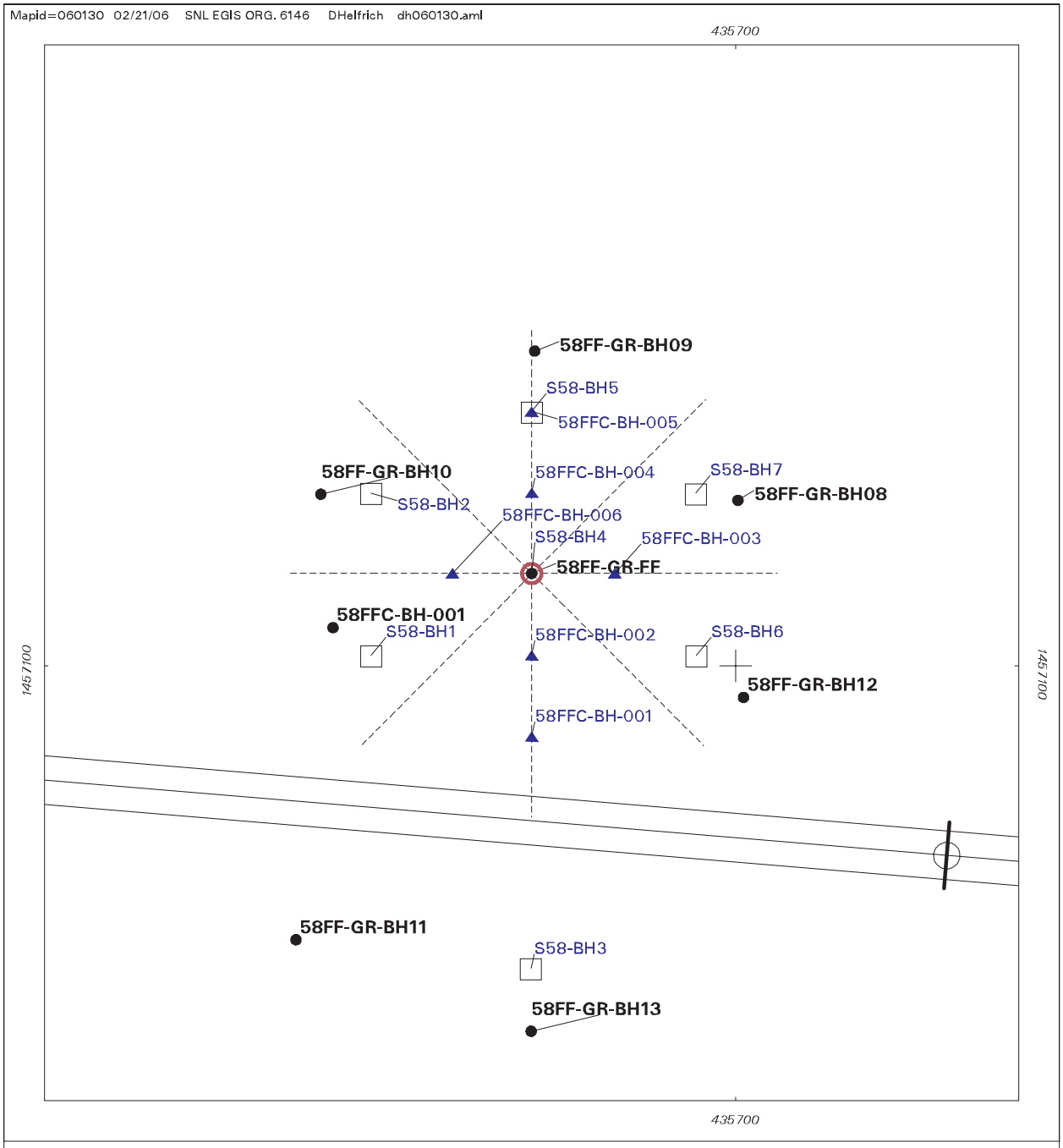

Legend

- April 96 and October 2005 Boring Location
- August 96 Boring Location
- April 97 Boring Location
- October 2005 Deep boring Location (in bold font)
- Power Pole
- Grid Line
- Power Line

Figure 5.2-1
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

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Environmental Geographic Information System

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A dual-tube percussion drilling rig was used to drill and sample all Feature 58FF 2005 boreholes at the required depth intervals. Material encountered in all eight of the Feature 58FF boreholes consisted of a mixture of silt, sand, gravel, and rock fragments. In general, the alluvial material appeared to be increasingly fine with depth. Bedrock or significant groundwater was not encountered in any of the eight deep boreholes at this site.

At each boring location, when the drill bit reached the top of each of the designated sampling depths, soil for each sample was obtained by drilling a 1-foot-long run that started at the top of the designated sampling interval. The soil from each 1-foot run was collected by holding a decontaminated, 5-gallon, plastic bucket beneath the bottom of the sample cuttings cyclone and collecting all of the material that was returned to the surface while a 1-foot length of borehole was drilled (Figure 5.2-2**)**. The collected material was thoroughly mixed with a hand trowel, then passed through brass screens with either 1- or 2-millimeter openings (depending upon the degree of dampness and silt and clay content of the collected material) to remove rocks and other oversized material from the sample (Figure 5.2-3). The soil that passed through the screens was then thoroughly mixed again, and an aliquot of this blended soil was transferred into sample containers and submitted for analysis. All samples were documented and handled in accordance with applicable SNL/NM operating procedures.

All of the October 2005 samples collected from the eight deep boreholes at Feature 58FF were analyzed for arsenic, beryllium, lead, and nickel by GEL. The sampling depths and analytical results for these deep borehole samples are presented in Tables 5.2-1 through 5.2-8. In six of the eight boreholes, samples were collected at 5-foot-depth intervals from 5 to 50 feet and at 10-foot intervals from 50 to 100 feet bgs. At the two remaining borehole locations (S58-BH4/58FF-GR-FF and S58-BH1/58FFC-BH-001 in Figure 5.2-1), soil samples had originally been collected from depths of 5 or 10 feet to 50 feet in April 1997. Therefore, additional deeper samples were collected at 10-foot intervals from 40 to 100 feet bgs at these two locations in the October 2005 boreholes. For completeness, metals analytical results for both the 1997 and 2005 samples are shown in Tables 5.2-7 and 5.2-8 for these two boreholes. The MDLs for the October 2005 metals samples from Feature 58FF are presented in Table 5.2-9.

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Figure 5.2-2
Collecting cuttings and soil from the drilling rig cyclone with a plastic bucket during the drilling of Borehole 58FF-GR-BH13. View to the northeast, October 23, 2005.

Figure 5.2-3
Processing soil collected from Borehole 58FF-GR-BH13 through a brass screen to remove oversized material. Power lines that traverse the Feature 58FF site can be seen behind the drilling rig. View to the southeast, October 23, 2005.

Table 5.2-1
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH8 at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 3005/3050[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel
608871	58FF-GR-BH8-005-S	5	ND (5.94)	0.714	8.83 J (9.9)	7.37
608871	58FF-GR-BH8-010-S	10	4.04	**0.926**	8.98	11.3
608871	58FF-GR-BH8-010-SD	10	3.65	**0.934**	7.98	11.3
608871	58FF-GR-BH8-015-S	15	3.76	**0.878**	7.54	10.4
608871	58FF-GR-BH8-020-S	20	3.56	**0.986**	7.57	8.7
608871	58FF-GR-BH8-025-S	25	5.99	**1.58**	15.2	**16.9**
608871	58FF-GR-BH8-030-S	30	**52.5**	**2.78**	6.08	**56.6**
608871	58FF-GR-BH8-035-S	35	**10.1**	**1.18**	7.58	**24.2**
608871	58FF-GR-BH8-040-S	40	**11.3**	**0.965**	7.21	**25.6**
608871	58FF-GR-BH8-045-S	45	**13.6**	**0.931**	10.8	**24**
608871	58FF-GR-BH8-050-S	50	**11.2**	**1.49**	8.53	**22.2**
608871	58FF-GR-BH8-060-S	60	**17.8**	**1.03**	12.2	**23**
608871	58FF-GR-BH8-070-S	70	**18.2**	**0.972**	7.91	16.6
608871	58FF-GR-BH8-080-S	80	**14.9**	**1.1**	8.54	16.5
608871	58FF-GR-BH8-090-S	90	**15**	**1.08**	7.51	10.4
608871	58FF-GR-BH8-100-S	100	**24.2**	**1.41**	11.2	14.8
Background Concentration—Canyons Area[c]			9.8	0.75	18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)						
608871	58FF-GR-BH8-EB		ND (0.006)	ND (0.001)	0.00344 J (0.01)	ND (0.001 J)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 5.2-2
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH9 at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 3005/3050[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel
608872	58FF-GR-BH9-005-S	5	4.2	0.472 J (0.498)	6.71	9.53
608872	58FF-GR-BH9-010-S	10	**16.9**	0.407 J (0.492)	8.16	10.1
608872	58FF-GR-BH9-010-SD	10	3.46	0.425 J (0.495)	9.06 J	11.3
608872	58FF-GR-BH9-015-S	15	2.46	0.531	7.6 J	10.4
608872	58FF-GR-BH9-020-S	20	2.63	0.423 J (0.497)	6.51	9.18
608872	58FF-GR-BH9-025-S	25	4.96	**1.29**	9.31 J	**17.8**
608872	58FF-GR-BH9-030-S	30	**82.4**	**3.54**	6.59	**59.1**
608872	58FF-GR-BH9-035-S	35	**10.6**	**0.848**	7.08	**23.6**
608872	58FF-GR-BH9-040-S	40	**13.7**	**0.959**	7.34	**24.9**
608872	58FF-GR-BH9-045-S	45	**12.8**	**0.974**	7.62	**21.5**
608872	58FF-GR-BH9-050-S	50	**16.3**	**0.973**	8.52	**23.8**
608872	58FF-GR-BH9-060-S	60	**15.5**	**0.816**	7.24	**18.2**
608872	58FF-GR-BH9-070-S	70	**18.7**	**0.858**	7.99	**20.4**
608872	58FF-GR-BH9-080-S	80	**14.2**	**1.23**	11.8	15
608872	58FF-GR-BH9-090-S	90	**25.4**	**1.12**	7.01	**21.7**
608872	58FF-GR-BH9-100-S	100	**20.3**	**1**	6.94	13.7
Background Concentration—Canyons Area[c]			9.8	0.75	18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)						
608872	58FF-GR-BH9-EB		ND (0.006)	ND (0.001)	0.011	ND (0.001 J)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 5.2-3
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH10 at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 3005/3050[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel
608873	58FF-GR-BH10-005-S	5	3.03	0.485 J (0.49)	6.39	9.72
608873	58FF-GR-BH10-010-S	10	3.26	0.515	8.17 J	11.7
608873	58FF-GR-BH10-010-SD	10	2.58	0.507	8.08 J	12.1
608873	58FF-GR-BH10-015-S	15	3.2	0.596	7.03	8.84
608873	58FF-GR-BH10-020-S	20	3.01	0.564	7.73	10.6
608873	58FF-GR-BH10-025-S	25	8.76	0.595	13	12.6
608873	58FF-GR-BH10-030-S	30	**51.3**	**2.3**	8.84	**38.8**
608873	58FF-GR-BH10-035-S	35	**13.6**	**1.2**	8.18	**18.4**
608873	58FF-GR-BH10-040-S	40	8.34	**0.78**	6.75	15.7
608873	58FF-GR-BH10-045-S	45	**23.5**	**1.18**	6.34	**25.5**
608873	58FF-GR-BH10-050-S	50	**13.9**	**1.05**	8.55	**25.8**
608873	58FF-GR-BH10-060-S	60	**15.8**	**0.854**	8.81	**24.8**
608873	58FF-GR-BH10-070-S	70	**14.9**	**0.762**	8.45	**23.4**
608873	58FF-GR-BH10-080-S	80	**12**	**0.844**	6.57	12.4
608873	58FF-GR-BH10-090-S	90	**35.6**	**1.33**	13	**40.1**
608873	58FF-GR-BH10-100-S	100	**20**	**1.09**	7.76	14.1
Background Concentration—Canyons Area[c]			9.8	0.75	18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)						
608873	58FF-GR-BH10-EB		ND (0.006)	ND (0.001)	0.0103	ND (0.001 J)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 5.2-4
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH11 at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 3005/3050[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel
608874	58FF-GR-BH11-005-S	5	7.89	0.553	14.9	10.7
608874	58FF-GR-BH11-010-S	10	4.9	0.529	12.8	13
608874	58FF-GR-BH11-010-SD	10	4.95	0.54	10.4	12.9
608874	58FF-GR-BH11-015-S	15	3.03	0.658	7.19	9.05
608874	58FF-GR-BH11-020-S	20	3.96	0.503	9.11	10.4
608874	58FF-GR-BH11-025-S	25	3.62	0.497	8.39	12.4
608874	58FF-GR-BH11-030-S	30	**29.2**	**2.06**	8.78	**32**
608874	58FF-GR-BH11-035-S	35	**26.5**	**1.52**	11.7	**28.8**
608874	58FF-GR-BH11-040-S	40	**15.7**	**0.997**	5.83	**32.4**
608874	58FF-GR-BH11-045-S	45	**13.2**	**0.838**	7.62	**22.5**
608874	58FF-GR-BH11-050-S	50	**46.7**	**1.59**	9.2	**38.3**
608874	58FF-GR-BH11-060-S	60	**17.6**	**1.42**	10.2	**28.6**
608874	58FF-GR-BH11-070-S	70	**69.6**	**2.13**	13.1	**55.4**
608874	58FF-GR-BH11-080-S	80	**34.1**	**1.54**	11.5	**18**
608874	58FF-GR-BH11-090-S	90	**57.2**	**1.84**	14.2	**19.6**
608874	58FF-GR-BH11-100-S	100	**47.1**	**1.68**	11.4	10.6
Background Concentration—Canyons Area[c]			9.8	0.75	18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)						
608874	58FF-GR-BH11-EB		ND (0.006)	ND (0.001)	ND (0.0025)	ND (0.001 J)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 5.2-5
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH12 at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 3005/3050[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel
608875	58FF-GR-BH12-005-S	5	5.09	0.415 J (0.498)	5.44	8.69
608875	58FF-GR-BH12-010-S	10	2.94	0.422 J (0.498)	7.32	10.8
608875	58FF-GR-BH12-010-SD	10	2.86	0.51	7.09	10.4
608875	58FF-GR-BH12-015-S	15	2.6	0.44 J (0.5)	8.51	10.6
608875	58FF-GR-BH12-020-S	20	2.88	0.419 J (0.5)	9.39	7.49
608875	58FF-GR-BH12-025-S	25	7.17	**1.33**	8.2	**16.9**
608875	58FF-GR-BH12-030-S	30	**26.2**	**1.77**	6.65	**36.2**
608875	58FF-GR-BH12-035-S	35	**42.3**	**1.76**	7.66	**43.4**
608875	58FF-GR-BH12-040-S	40	**11.1**	0.739	8.03	**25.5**
608875	58FF-GR-BH12-045-S	45	**13.6**	**0.918**	7.04	**21.3**
608875	58FF-GR-BH12-050-S	50	**13.8**	**0.965**	8.04	**21.1**
608875	58FF-GR-BH12-060-S	60	**14.9**	0.612	5.82	13.9
608875	58FF-GR-BH12-070-S	70	**12.9**	**0.858**	6.45	12.2
608875	58FF-GR-BH12-080-S	80	**19.5**	**1.19**	9.25	11.9
608875	58FF-GR-BH12-090-S	90	**26.9**	**1.6**	14.8	**21.5**
608875	58FF-GR-BH12-100-S	100	**50.1**	**1.56**	10.8	**17.7**
Background Concentration—Canyons Area[c]			9.8	0.75	18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)						
608875	58FF-GR-BH12-EB		ND (0.006)	ND (0.001)	ND (0.0025)	ND (0.001 J)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 5.2-6
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH13 at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 3005/3050[a]) (mg/kg)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel
608876	58FF-GR-BH13-005-S	5	7.19	0.708	8.92	11.5
608876	58FF-GR-BH13-010-S	10	2.93	0.445 J (0.496)	7.62	11.3
608876	58FF-GR-BH13-010-SD	10	3.43	0.479 J (0.492)	8.28	10.5
608876	58FF-GR-BH13-015-S	15	2.7	0.45 J (0.49)	7.49	10.1
608876	58FF-GR-BH13-020-S	20	2.98	0.569	6.81	7.66
608876	58FF-GR-BH13-025-S	25	9.43	**1.59**	10.4	**21.4**
608876	58FF-GR-BH13-030-S	30	**13.7**	**1.19**	11.8	**19.3**
608876	58FF-GR-BH13-035-S	35	**28.6**	**1.62**	9.31	**32.4**
608876	58FF-GR-BH13-040-S	40	**15.2**	**1.42**	9.12	**29.4**
608876	58FF-GR-BH13-045-S	45	**13.4**	**0.931**	7.36	**19.3**
608876	58FF-GR-BH13-050-S	50	**33.4**	**1.32**	8.23	**30.6**
608876	58FF-GR-BH13-060-S	60	**15.4**	**1.35**	12.6	**73.7**
608876	58FF-GR-BH13-070-S	70	**47.6**	**1.66**	11.4	**33.3**
608876	58FF-GR-BH13-080-S	80	**27**	**1.06**	7.98	12.5
608876	58FF-GR-BH13-090-S	90	**56.9**	**1.96**	**19.2**	**24.6**
608876	58FF-GR-BH13-100-S	100	**49.6**	**1.47**	7.13	**21.2**
Background Concentration—Canyons Area[c]			9.8	0.75	18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)						
608876	58FF-GR-BH13-EB		ND (0.006)	ND (0.001)	0.00421 J (0.01)	ND (0.001 J)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 5.2-7
Summary of Confirmatory Soil Sampling, Boreholes S58-BH4 and 58FF-GR-FF at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results
April 1997 and October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 6010, 7470/7471 [1997 samples] and 3005/3050 [2005 samples])[a] (mg/kg)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel
April 1997 Soil Samples from Borehole S58-BH4						
05014	S58-BH4-016-010-SA	10	1.18	0.159 J (0.481)	3.24 J	4.33
05014	S58-BH4-017-020-SA	20	1.16	0.166 J (0.500)	3.15 J	3.68
05014	S58-BH4-018-030-SA	30	**12.6**	**1.09**	4.98 J	**22.4**
05014	S58-BH4-019-040-SA	40	5.46	0.474 J (0.490)	6.36 J	**25.4**
05014	S58-BH4-020-050-SA	50	8.89	0.692	4.61 J	8.8
October 2005 Samples from Borehole 58FF-GR-FF						
608877	58FF-GR-FF-060-S	60	**13.2**	**1.04**	7.57	16.4
608877	58FF-GR-FF-070-S	70	**18.6**	**1.04**	9	**20.8**
608877	58FF-GR-FF-070-SD	70	**18.9**	**1.06**	10.3	**21.3**
608877	58FF-GR-FF-080-S	80	**49.1**	**1.99**	18.4	**32.4**
608877	58FF-GR-FF-090-S	90	**37.6**	**1.43**	8.43	15.7
608877	58FF-GR-FF-100-S	100	**24.6**	**1.12**	7.74	11.1
Background Concentration—Canyons Area[c]			9.8	0.75	18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)						
608877	58FF-GR-FF-001-EB		ND (0.006)	ND (0.001)	0.00363 J (0.01)	ND (0.001 J)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
S, SA = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 5.2-8
Summary of Confirmatory Soil Sampling, Boreholes S58-BH1 and 58FFC-BH-001 at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical Results
April 1997 and October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 6010, 7470/7471 [1997 samples] and 3005/3050 [2005 samples])[a] (mg/kg)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel
April 1997 Soil Samples from Borehole S58-BH1, located 6 feet southeast of Borehole 58FFC-BH-001						
06579	S58-BH1-001-010-SA	10	1.43 J	0.223 J (0.467)	4.33 J	6.78 J
06579	S58-BH1-002-020-SA	20	0.424 J	0.142 J (0.476)	2.3 J	1.87 J
06579	S58-BH1-003-030-SA	30	**16.5 J**	**0.863 J**	3.72 J	**16.9 J**
06579	S58-BH1-004-040-SA	40	9.22 J	0.529 J	7 J	15.9 J
06579	S58-BH1-005-050-SA	50	**10.8 J**	**1.07 J**	7.58 J	16.3 J
October 2005 Samples from Borehole 58FFC-BH-001 Location						
608878	58FFC-BH-001-060-S	60	**17.3**	**0.776**	7.64	**20**
608878	58FFC-BH-001-070-S	70	**20.6**	**1.08**	8.58	**17.6**
608878	58FFC-BH-001-070-SD	70	**23.3**	**1.16**	9.02	**17.3**
608878	58FFC-BH-001-080-S	80	**15.4**	**0.899**	6.81	14.8
608878	58FFC-BH-001-090-S	90	**25.7**	**1.16**	7.45	15.6
608878	58FFC-BH-001-100-S	100	**26.9**	**1.3**	8.17	15.5
Background Concentration—Canyons Area[c]			9.8	0.75	18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)						
608878	58FFC-GR-FF-001-EB		ND (0.006)	ND (0.001)	ND (0.0025)	ND (0.001)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
S, SA = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 5.2-9
Confirmatory Soil Sampling, Boreholes 58FF-GR-BH8 through
58FF-GR-BH13, 58FF-GR-FF, and 58FFC-BH-001 at Feature 58FF
Fire Brick Area at SWMU 58, Coyote Canyon Blast Area, Metals Analytical MDLs
October 2005
(Off-Site Laboratory)

Analyte	EPA Method 3005/3050[a] Detection Limit (mg/kg)
Arsenic	0.588–5.94
Beryllium	0.098–0.1
Lead	0.245–2.48
Nickel	0.098–0.1

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.

5.3 Feature 58FF Soil Sampling Results and Conclusions

As shown in Tables 5.2-1 through 5.2-8, arsenic, beryllium, and nickel concentrations in soil samples collected from all eight deep boreholes drilled at Feature 58FF consistently started to exceed their respective background concentrations at approximately 30 feet bgs. All borehole samples were also analyzed for lead and, with only one exception (the 90-foot sample from Borehole 58FF-GR-BH13), lead concentrations in these samples were less than the lead background concentration of 18.9 mg/kg. The preliminary analytical data summary tables for soil samples from the eight Feature 58FF deep boreholes were presented to, and discussed with, NMED personnel on Thursday, January 26, 2006. Brian Salem with the NMED verbally agreed that the two cross sections that SNL/NM committed to preparing in the August 2005 SAP (Section 5.1) would not add to or improve the understanding of subsurface conditions at the site beyond what was evident from the data tables and therefore would not be required (Sanders January 2006).

Known activities conducted at the Feature 58FF fire brick area, included burn tests in which weapons were subjected to a jet fuel fire to determine how the explosives inside the weapons would react. The fire bricks found at the site were used to secure the various weapons during the burn tests. These weapons burn tests may have deposited metal shrapnel if the weapons had detonated during the burn tests. Most of the materials released in the surface or near-surface soil as a result of the burn tests would have been nonhazardous materials such as aluminum, steel, and other metal alloys from the weapon cases, metal pans, and test components. Lead alloy was present at Feature 58FF and may have been released to the environment (SNL/NM June 1995).

Therefore, based upon the types of testing conducted at Feature 58FF, only surface metals contamination would be expected at this site and it would not be expected to extend into the subsurface. However, in all eight boreholes drilled at this site, arsenic, beryllium, and nickel concentrations were consistently higher at depth than near the surface. It is highly unlikely that this phenomenon would be caused by surface testing activities conducted at Feature 58FF, and

instead appears to reflect naturally-occurring subsurface conditions at the site. Although bedrock was not encountered in any of the eight Feature 58FF deep boreholes, it is suspected that the granitic bedrock that underlies the site may contain anomalous, elevated metals concentrations due to natural hydrothermal activity in the area (discussed in Section 6.3). If this is the case, as the bedrock weathers and erodes, a portion of this mineralized granitic material would become incorporated into the alluvial sediment veneer overlying bedrock and therefore would also result in elevated metals concentrations in the deeper portion of the alluvial material at this site.

The consistent transition in all eight boreholes from below- to above-background arsenic, beryllium, and nickel concentrations at approximately 30 feet bgs may reflect a stratigraphic transition from the youngest historic to Holocene-age alluvium to older, late Pleistocene stream alluvium starting at about 30 feet bgs at this site (NMBM&MR February 2000). These older alluvial sediments directly overlie bedrock and therefore would be expected to contain a higher proportion of incorporated bedrock material than the near-surface sediment. If that bedrock is mineralized and contains elevated metals concentrations, this could account for the elevated metals concentrations in the older and deeper alluvial material compared to concentrations in the near-surface sediment.

6.0 FEATURE 58OO OPEN BOREHOLE SOIL SAMPLING

6.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005)

5. Feature 58OO Open Bore Hole:

The vertical extent of soil contamination was not determined at this Feature. In particular, concentrations of arsenic and zinc remained high at the bottom of the borehole. A supplemental borehole should be advanced at this feature, and soil sampled and analyzed for metals and radionuclides.

Response: One additional borehole will be advanced to a depth of 100 ft or to bedrock. The borehole will be advanced adjacent to the original borehole (within 2 ft), and subsurface samples will be collected at 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, and 100 ft depths. All samples will be analyzed for arsenic, beryllium and zinc. In addition, samples from the 40, 50, 60, 70, 80, 90, and 100 ft depths will be analyzed for radionuclides by gamma spectroscopy. A SAP was prepared to address the additional sampling activities, and is included as an attachment to this response.

6.2 Feature 58OO Open Borehole Soil Sample Collection and Analytical Results

The location of Feature 58OO is shown in Figure 2.2-1. This open borehole measured 2 feet in diameter by 38 feet deep in April 1997, and it was backfilled to the surface with clean soil at that time (SNL/NM April 2005). On October 25, 2005, a single boring was drilled at Feature 58OO with the same dual-tube percussion drilling rig used at Feature 58FF, and subsurface soil samples were collected at 5-foot depth intervals from 40 to 70 feet bgs. Sample collection started at 40 feet bgs because the Feature 58OO open borehole had originally been 38 feet deep, and it was assumed that potential COCs that may have been generated by testing in this borehole would have entered the subsurface started at approximately 38 feet bgs. As at Feature 58FF, material encountered in the borehole from 40 to 68 feet bgs consisted of a mixture of silt, sand, gravel, and rock fragments. At a depth of 68 feet bgs, a 2-foot-thick layer of water-saturated clay that was dark orange-yellow due to apparent abundant iron oxide was penetrated. Bedrock was encountered at a depth of approximately 70 feet bgs in this boring, and drilling in bedrock continued until it was stopped at 71.8 feet bgs. Bedrock fragments returned to the surface from the boring consisted of heavily iron oxide-stained granite and iron oxide-cemented granitic gravel or breccia.

The alluvial material samples collected from this borehole were collected, sieved, and processed in the same manner as the Feature 58FF soil samples and analyzed for arsenic, beryllium, and zinc, as well as radionuclides by gamma spectroscopy by GEL. The analytical results and MDLs for the metals samples are presented in Tables 6.2-1 and 6.2-2, respectively. The analytical results for the four representative gamma spectroscopy radionuclides are summarized in Table 6.2-3. The complete gamma spectroscopy analytical reports for these four samples are presented in Annex A of this document.

Table 6.2-1
Summary of Confirmatory Soil Sampling, Borehole 58OO-GR at Feature 58OO
The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area), Metals Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 3005/3050[a]) (mg/kg)		
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Zinc
608880	5800-GR-040-S/S8-GR-001	40	4.81	**1.24**	43.8
608880	5800-GR-045-S	45	6.92	**1.22**	**73.9**
608880	5800-GR-045-SD	45	7.82	**1.38**	**75.4**
608880	5800-GR-050-S	50	**12.4**	**0.819**	**52.6**
608880	5800-GR-055-S	55	**143**	**2.24**	**124**
608880	5800-GR-060-S	60	**230**	**2.7**	**135**
608880	5800-GR-065-S	65	**361**	**3.39**	**161**
608880	5800-GR-070-S	70	**1,240**	**11.3**	**484**
58OO-GR Bedrock Sample					
609332	5800-GR-071-S	71	**2,510**	**20**	**502**
Background Concentration—Canyons Area[c]			9.8	0.75	52.1
Quality Assurance/Quality Control Samples (mg/L)					
608880	5800-GR-EB	NA	ND (0.006)	ND (0.001)	0.0072 J (0.01)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 6.2-2
Confirmatory Soil Sampling, Borehole 58OO-GR at Feature 58OO
The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area)
Metals Analytical MDLs
October 2005
(Off-Site Laboratory)

Analyte	EPA Method 3005/3050[a] Detection Limit (mg/kg)
Arsenic	0.588–5.99
Beryllium	0.098–0.1
Zinc	0.196–2

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.

Table 6.2-3
Summary of Confirmatory Soil Sampling, Borehole 58OO-GR at Feature 58OO
The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area), Gamma Spectroscopy Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Activity (Method HASL-300[a]) (pCi/g)							
Record Number[b]	ER Sample ID	Sample Depth (ft)	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
			Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
608880	5800-GR-040-S	40	ND (0.0215)	--	0.989	0.0944	ND (0.122)	--	1.29	1.01
608880	5800-GR-050-S	50	ND (0.0209)	--	0.594	0.0368	ND (0.112)	--	ND (0.685)	--
608880	5800-GR-060-S	60	ND (0.0261) R	--	0.587	0.0641	ND (0.16)	--	1.89	0.957
608880	5800-GR-070-S	70	ND (0.0219)	--	0.506	0.035	ND (0.156)	--	1.09	0.739
Background Activity—Lower Canyons Area[d]			1.55	NA	1.03	NA	0.16	NA	2.31	NA

[a]HASL/EML 1997.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean detected activity.
[d]Dinwiddie September 1997.
EML = Environmental Measurements Laboratory.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HASL = Health and Safety Laboratory.
ID = Identification.
MDA = Minimum detectable activity
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
pCi/g = Picocurie(s) per gram.
R = Value rejected during data validation.
S = Soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

6.3 Feature 58OO Open Borehole Soil Sampling Results and Conclusions

As shown in Table 6.2-1, concentrations of three metals of concern (arsenic, beryllium, and zinc) at Feature 58OO steadily increased with depth. Elevated, above-background metals concentrations were detected in the deeper portions of this borehole, as was also the case in the eight Feature 58FF deep boreholes, located approximately 830 feet northeast of Feature 58OO (Figure 2.2-1). The trend of increasing metals concentrations as sample depths increase is the opposite of what would be expected if metals contamination were introduced into the environment at the site as a result of testing in the Feature 58OO borehole. There are no known activities conducted at this site that would have driven metals downward and cause a steady increase of metals concentrations with depth at this site.

It is also suspected that a probable source of the elevated metals detected in alluvial material samples collected from the borehole is the highly altered and mineralized bedrock underlying Feature 58OO that was encountered at a depth of approximately 70 feet bgs in the borehole. If this is the case, as is speculated at Feature 58FF, bedrock material would erode and weather over time and become incorporated into the overlying alluvial material at the site. In order to determine whether the altered, iron-stained bedrock is a potential metals source, a sample of the material was submitted to GEL and analyzed for Target Analyte List metals and gold. The laboratory crushed individual pieces of bedrock provided to them, thoroughly mixed the crushed material, and withdrew a representative aliquot of the crushed and blended bedrock for analysis. As shown in Table 6.2-1, the arsenic, beryllium, and zinc concentrations in the bedrock sample were higher than those in any of the overlying alluvial material samples and continued the trend of increasing arsenic, beryllium, and zinc concentrations with depth at this site. Concentrations of additional metals for which approved Canyons background concentrations are available were also reported by the laboratory for the bedrock sample, and a number of those metals, but not all, were found to be elevated above background, as shown in Table 6.3-1. The MDLs for these 12 metals are presented in Table 6.3-2.

Additional samples of the bedrock were also examined for evidence of hydrothermal mineralization. Figure 6.3-1 is a photo of a sample of the altered bedrock with a small (approximately 2 millimeter) euhedral barite (barium sulfate) crystal in a cavity (circled area on the photo), and Figure 6.3-2 is a photomicrograph of that barite crystal. Microcrystals of botryoidal fluorite (calcium fluoride), as well as additional barite crystals were also found in this bedrock material. Crystals such as barite and fluorite are typically formed from hydrothermal fluids that migrate along and through open fractures and cavities in rock and that encounter sufficient open space for euhedral crystals to form. Crystals such as these are considered strong evidence that the elevated metals concentrations found in both the bedrock and the overlying alluvial material at Feature 58OO are the result of hydrothermal activity in the area, and are therefore the result of natural, rather then anthropogenic processes.

Therefore, for these reasons, the elevated metals concentrations detected in samples from this borehole are considered to be natural in origin and not the result of testing activities conducted at the site.

Table 6.3-1
Summary of Metals Concentrations in the Bedrock Sample from Borehole 58OO-GR at Feature 58OO
The Open Borehole Area at SWMU 8, Open Dump (Coyote Canyon Blast Area)
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 6010)[a] (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt
609332	58OO-GR-071-S	71	**2,510**	52.7 J	**20.0**	**ND (1.98)**	13.4	**22.0**
Background Concentration—Canyons Area[c]			9.8	246	0.75	0.64	18.8	8.3

Sample Attributes			Metals (EPA Method 6010)[a] (mg/kg)					
Record Number[b]	ER Sample ID	Sample Depth (ft)	Copper	Lead	Nickel	Selenium	Silver	Zinc
609332	58OO-GR-071-S	71	**50.9**	13.7	**60.4**	**ND (5.93)**	**ND (1.98)**	**502**
Background Concentration—Canyons Area[c]			17.1	18.9	16.6	2.7	<0.5	52.1

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
ND ( ) = Not detected, but the MDL (shown in parentheses) exceeds background concentration.
S = Soil sample.
SWMU = Solid Waste Management Unit.

Table 6.3-2
Metals Concentrations in the Bedrock Sample from
Borehole 58OO-GR at Feature 58OO, The Open Borehole Area at SWMU 8
Open Dump (Coyote Canyon Blast Area), Metals Analytical MDLs
October 2005
(Off-Site Laboratory)

Analyte	EPA Method 6010[a] Detection Limit (mg/kg)
Arsenic	5.93
Barium	0.988
Beryllium	0.988
Cadmium	1.98
Chromium	0.988
Cobalt	1.98
Copper	2.96
Lead	2.47
Nickel	0.988
Selenium	5.93
Silver	1.98
Zinc	1.98

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.

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Figure 6.3-1
Side view of a 7.5-centimeter-wide fragment of the iron oxide-impregnated and stained granitic bedrock from 71 feet bgs in Borehole 58OO-GR. A small (2 millimeter) barite crystal in a cavity in the upper right side of the fragment is circled and is also shown in Figure 6.3-2.

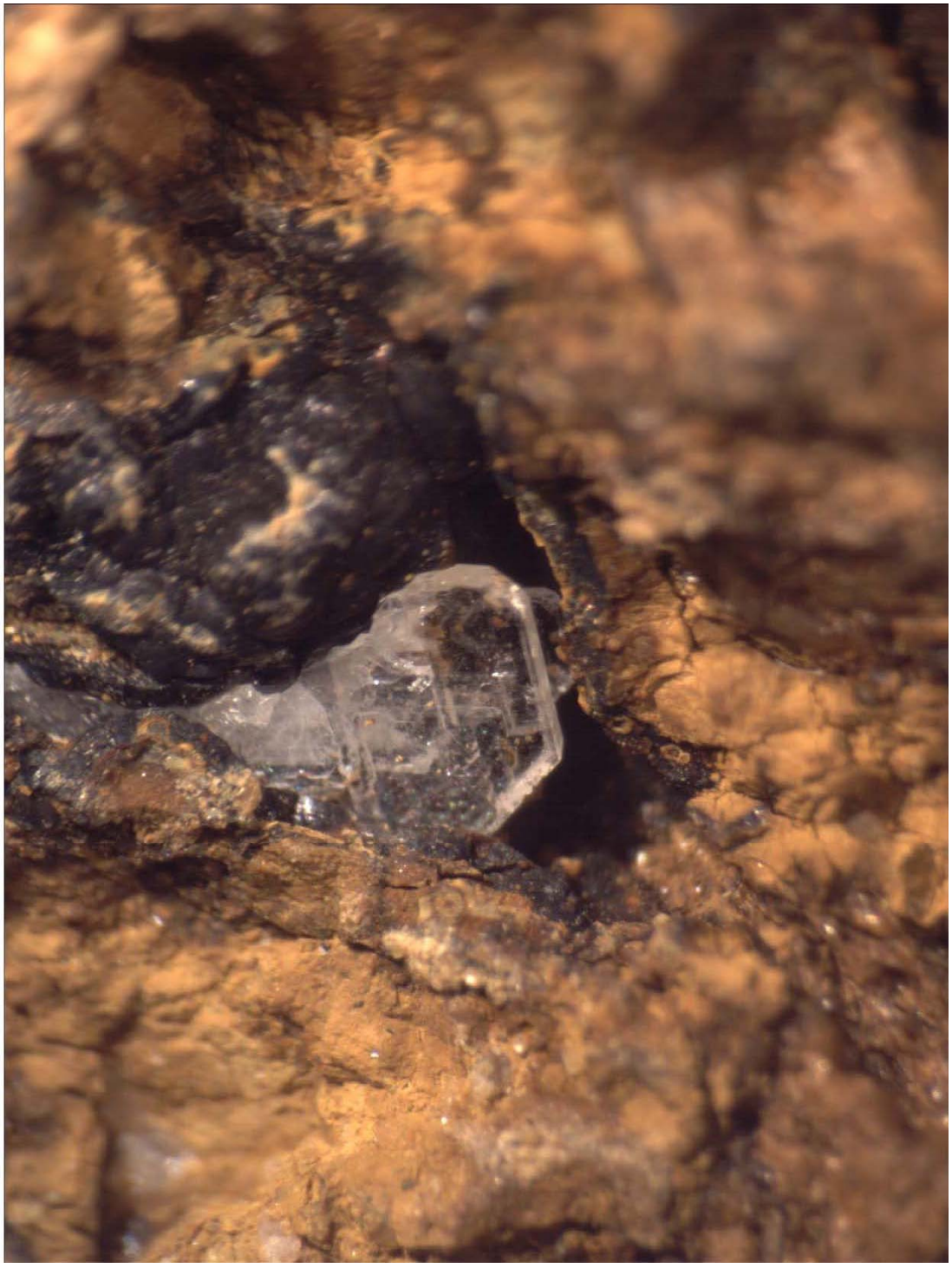

Figure 6.3-2
Photomicrograph of the 2-millimeter euhedral barite crystal in a cavity, contained in the circled area of the rock fragment shown in Figure 6.3-1.

As shown in Figure 6.3-3, the projected surface trace of the major Vincent Moore thrust fault is located approximately 700 feet north of the Feature 58OO borehole location. The Tijeras quadrangle geologic map (NMBM&MR February 2000), the basis for the geology shown in Figure 6.3-3, shows that this fault is dipping to the south, toward and beneath Features 58FF and 58OO. These two sites are also located approximately 4,500 feet southeast of the Tijeras Fault zone. It is therefore apparent that there are deep-seated geologic structures in bedrock in the immediate area of both Features 58FF and 58OO that would serve as conduits for circulating metal-bearing hydrothermal fluids. These hydrothermal fluids are a likely source for the metal-bearing mineralization observed in the bedrock samples from the 58OO-GR borehole and in the overlying alluvial sediments at the two sites.

SWMUs 8 and 58 are also located within the Tijeras Canyon and Coyote Canyon mining districts. Mineralization in this district consists predominantly of fluorite, barite, calcite, and malachite veins and stringers that primarily occur in Paleoproterozoic rocks. Lead and fluorspar ore were shipped between 1910 and 1923 and also during World War II. Major workings in the SWMU 8 and 58 area include the Red Hill mine (approximately 2.3 miles northeast of the site) and the Eighty-Five and Blackbird mines, located approximately 2.7 and 2.8 miles east of the site, respectively (Fulp et al. November 1982).

Four samples were also collected from Borehole 58OO-GR and analyzed for radionuclides by gamma spectroscopy. As shown in Table 6.2-3, no activities above the NMED-approved background levels for the four representative radionuclides were detected in any of the samples. This indicates that significant levels of radioactive material are not present in the subsurface at Feature 58OO.

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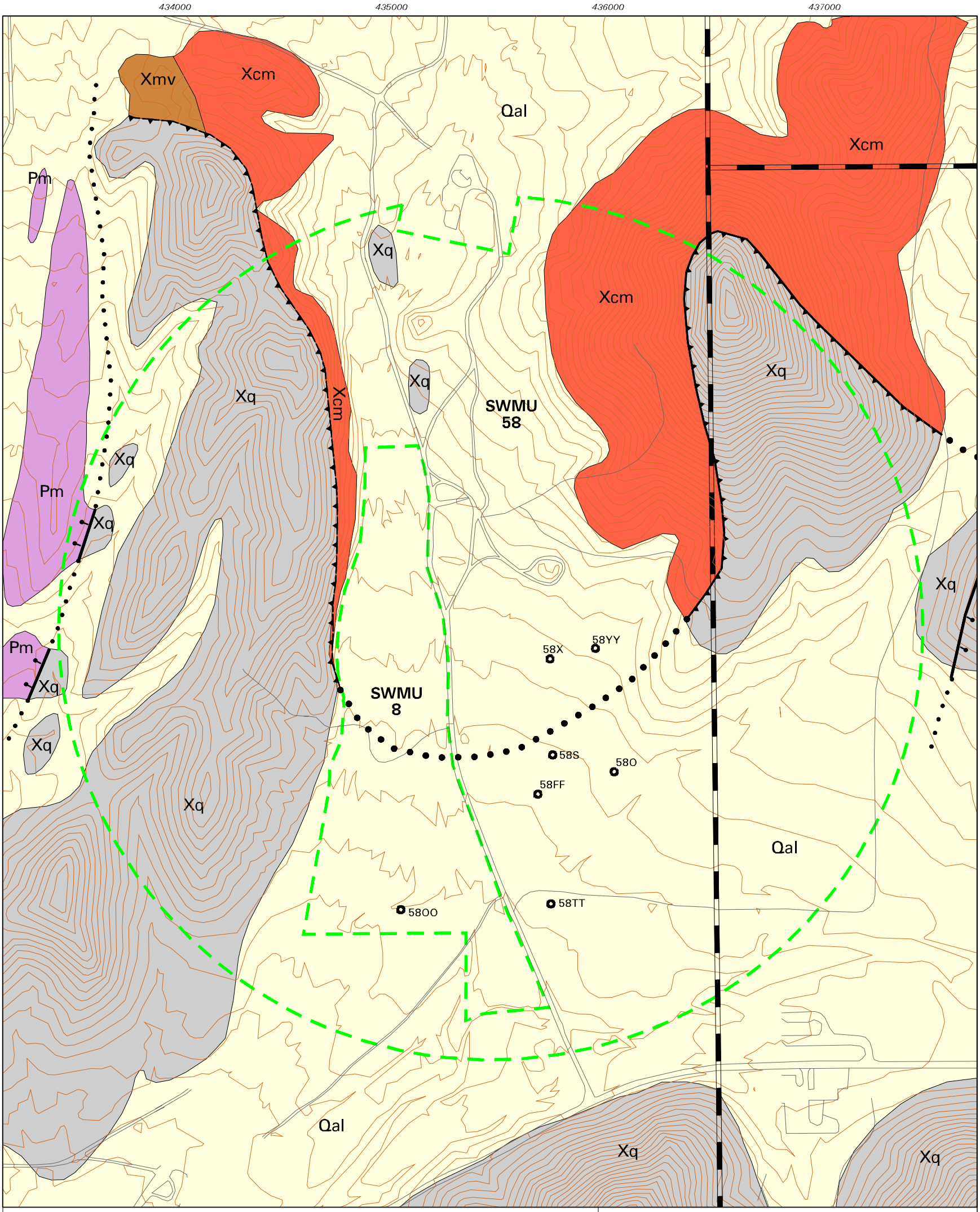

Legend

- 58FF, 58O, 58OO, 58S, 58TT, 58X, and 58YY
- 10 Foot Contour
- KAFB Boundary
- Unpaved Road
- SWMUs 8 & 58 Boundaries
- Thrust Fault, exposed, triangular teeth on upthrown side
- Thrust Fault concealed
- Normal Fault exposed, ball and bar on downthrown side
- Normal Fault concealed

0 500 1000
Scale in Feet

0 120 240
Scale in Meters

- Qal — Quaternary alluvium undifferentiated
- Pm — Pennsylvanian Madera Formation, arkosic and gray limestone
- Xcm — Paleoproterozoic medium grained Cibola Monzogranite
- Xq — Paleoproterozoic quartzite
- Xmv — Paleoproterozoic mafic metavolcanic rocks

Figure 6.3-3
General Geologic Map of the SWMU 8 and 58 Area

(from the Tijeras Quadrangle Geologic Map. New Mexico Bureau of Mines and Mineral Resources Open File Map Series OF-GM-4 February 28, 2000).

Sandia National Laboratories, New Mexico
Environmental Operations Geographic Information System

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7.0 FEATURE 58TT FIRE BRICK AREA SOIL SAMPLING

7.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005)

6. Feature 58TT Fire Brick Area:

Three of six soil samples collected at this feature have uranium-235 and uranium-238 activities that greatly exceed background levels. These samples are located in the western quarter of the feature. Additional soil samples are needed from depths of one to two feet bgs to determine the extent of soil contamination. In addition to radionuclides, the samples should be analyzed for metals, VOCs, and SVOCs.

Response: Three surface and three subsurface soil samples will be collected in the western edge of the site, immediately west of Location IDs S58FB2-GR-001, -002, and -003. In addition, three subsurface samples will be collected beneath Location IDs S58FB2-GR-001, S58FB2-GR-002, and S58FB2-GR-003. The surface samples will be analyzed for lead, and the subsurface samples will be analyzed for uranium isotopes and total uranium by ICP mass spectroscopy. VOCs, SVOCs, and other metals are not a COC at Feature 58TT; therefore, analysis for VOCs, SVOCs, and other metals will not be performed. A SAP was prepared to address the additional sampling activities, and is included as an attachment to this response.

7.2 Feature 58TT Fire Brick Area Soil Sample Collection and Analytical Results

The location of Feature 58TT is shown in Figure 2.2-1. On September 13, 2005, three primary surface soil samples and one duplicate were collected from three locations (58FB2-GR-007, -008, and -009) shown in Figure 7.2-1, and six subsurface (2-foot-depth) soil samples were collected from six boring locations (58FBR-GR-001, -002, -003, -007, -008, and -009 [Figure 7.2-1]) in March 1999. The four surface samples were analyzed by GEL for lead, and the six subsurface samples were analyzed for lead, uranium, and isotopic uranium (U-235 and U-238). The analytical results for all lead, uranium, and isotopic uranium samples collected from Feature 58TT in March 1999 and September 2005 are presented in Tables 7.2-1 and 7.2-3, respectively. The MDLs and MDAs for the September 2005 lead, uranium, and isotopic uranium analyses are presented in Tables 7.2-2 and 7.2-4**,** respectively.

7.3 Feature 58TT Fire Brick Area Soil Sampling Results and Conclusions

As shown in Table 7.2-1, lead concentrations in the four additional surface soil samples collected in September 2005 from the western portion of Feature 58TT were all below background. The lead samples collected in March 1999 and September 2005 indicate that above-background lead concentrations are confined to the west-central portion of Feature 58TT and do not appear to extend beyond the site boundaries shown in Figure 7.2-1.

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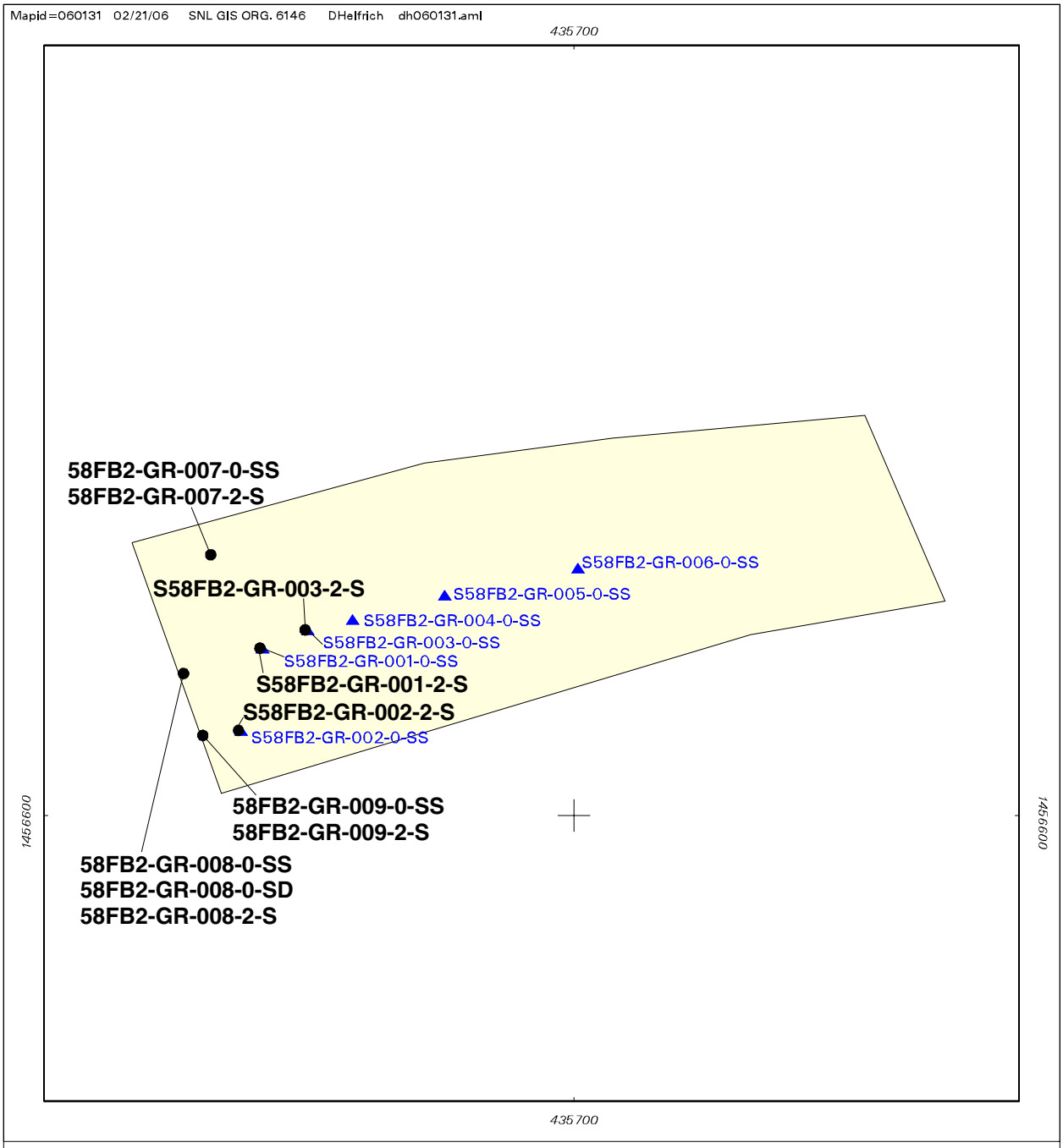

Legend

- March 1999 Judgmentally Selected Sample Location
- September 2005 Sample Location (in bold font)
- Radiation Survey Area

Figure 7.2-1
Soil Sample Locations at Feature 58TT Fire Brick Area No.2, SWMU 58, Coyote Canyon Blast Area

0 10 20
Scale In Feet

0 2.4 4.8
Scale In Meters

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Table 7.2-1
Summary of Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58
Coyote Canyon Blast Area, Lead Analytical Results
March 1999 and September 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 6010 [1999 samples] and 3050 [2005 samples])[a] (mg/kg)
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead
March 1999 Soil Samples			
601584	S58FB2-GR-001-0-SS	0	**24.7 J**
601584	S58FB2-GR-002-0-SS	0	**78.8 J**
601584	S58FB2-GR-003-0-SS	0	**29.8 J**
601584	S58FB2-GR-004-0-SS	0	5.72 J
601584	S58FB2-GR-004-0-SD	0	5.9 J
601584	S58FB2-GR-005-0-SS	0	6.16 J
601584	S58FB2-GR-006-0-SS	0	6.09 J
September 2005 Soil Samples			
608869	58FB2-GR-007-0-SS	0	12.5
608869	58FB2-GR-008-0-SS	0	10.7
608869	58FB2-GR-008-0-SD	0	14.5
608869	58FB2-GR-009-0-SS	0	11.3
Background Concentration—Canyons Area[c]			18.9
Quality Assurance/Quality Control Sample (mg/L)			
608869	58O-GR-100-0-EB		ND (0.0005)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND ( ) = Not detected above the MDL, shown in parentheses.
SD = Sample duplicate.
SS = Surface sample.
SWMU = Solid Waste Management Unit.

Table 7.2-2
Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58
Coyote Canyon Blast Area, Lead Analytical MDLs
September 2005
(Off-Site Laboratory)

Analyte	EPA Method 3050[a] Detection Limit (mg/kg)
Lead	0.0982–0.1

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.

Table 7.2-3
Summary of Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58
Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical Results
March 1999 and September 2005
(On- and Off-Site Laboratories)

Sample Attributes			Uranium, Uranium-235, and Uranium-238				
Record Number[a]	ER Sample ID	Sample Depth (ft)	Uranium (mg/kg)	Uranium-235 (pCi/g)		Uranium-238 (pCi/g)	
				Result	Error[b]	Result	Error[b]
March 1999 Soil Samples: Uranium-235 and Uranium-238 by Gamma Spectroscopy (On-Site Laboratory)							
601583	S58FB2-GR-001-0-SS	0	NR	**0.905**	0.398	**59.5**	30.2
601583	S58FB2-GR-002-0-SS	0	NR	**1.25**	0.417	**84.6**	12.1
601583	S58FB2-GR-003-0-SS	0	NR	**1.49**	1.12	**93.0**	12.7
601583	S58FB2-GR-004-0-SS	0	NR	**ND (0.193)**	--	0.786	0.532
601583	S58FB2-GR-004-0-SD	0	NR	0.134	0.163	ND (0.498)	--
601583	S58FB2-GR-005-0-SS	0	NR	**ND (0.220)**	--	ND (0.789)	--
601583	S58FB2-GR-006-0-SS	0	NR	**ND (0.207)**	--	ND (0.717)	--
September 2005 Soil Samples: Uranium, Uranium-235, and Uranium-238 by EPA Method 3050 (Off-Site Laboratory)[c]							
608869	S58FB2-GR-001-2-S	2	**29.1**	0.153	NC	**9.657**	NC
608869	S58FB2-GR-002-2-S	2	**8.52**	0.045	NC	**2.830**	NC
608869	S58FB2-GR-003-2-S	2	**19.1**	0.101	NC	**6.327**	NC
608869	58FB2-GR-007-2-S	2	0.603	0.007 J (0.030)	NC	0.199	NC
608869	58FB2-GR-008-2-S	2	**6.64**	0.035	NC	2.204	NC
608869	58FB2-GR-009-2-S	2	**7.5**	0.040	NC	**2.491**	NC
Background Concentration and Activities—North/Tijeras/Southwest/CTF/Off-Site Supergroup Areas for Uranium (mg/kg), and Canyons Area for Uranium-235 and Uranium-238 (pCi/g)[d]			3.42	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities or have MDAs that exceed background activities.

[a]Analysis request/chain-of-custody record.

[b]Two standard deviations about the mean activity.

[c]For the September 2005 soil samples, uranium-235 and uranium-238 activities, reported in units of mg/kg by the laboratory, were converted to pCi/g for comparison to pCi/g background activities according to the following conversions: 1 microgram uranium-235 and uranium-238 = 2.163 and 0.333 pCi respectively (Miller January 2006).

[d]Dinwiddie September 1997.

CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.

Table 7.2-3 (Concluded)
Summary of Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58
Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical Results
March 1999 and September 2005
(On- and Off-Site Laboratories)

J ( ) = The reported value is greater than or equal to the MDA but is less than the practical quantitation limit, shown in parentheses.
MDA = Minimum detectable activity.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NC = Not calculated.
ND ( ) = Not detected above the MDA, shown in parentheses.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds background level.
NR = Not reported. Sample not analyzed for this analyte, or not reported by the analytical laboratory.
pCi/g = Picocurie(s) per gram.
S = Soil sample.
SD = Sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 7.2-4
Confirmatory Soil Sampling, Feature 58TT Fire Brick Area at SWMU 58
Coyote Canyon Blast Area, Uranium and Isotopic Uranium Analytical MDLs and MDAs
September 2005
(Off-Site Laboratory)

Analyte	EPA Method 3050[a] Detection Limit
Uranium	0.00984–0.01 (mg/kg)
Uranium-235	0.00426–0.00433 (pCi/g)[b]
Uranium-238	0.00328–0.00333 (pCi/g)[b]

[a]EPA November 1986.
[b]Uranium-235 and Uranium-238 activities reported in units of mg/kg by the laboratory, and were converted to pCi/g for comparison to pCi/g background activities according to the following conversions:
1 microgram uranium-235 and uranium-238 = 2.163 and 0.333 pCi respectively (Miller January 2006).
EPA = U.S. Environmental Protection Agency.
MDA = Minimum detectable activity.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

As shown in Table 7.2-3, the total uranium and uranium-238 concentrations and activities in the September 2005 subsurface soil samples were above background in five of the six samples, and uranium-235 activities did not exceed background in any of the six samples. A comparison of the uranium-235 and uranium-238 activities in seven surface soil samples collected in March 1999 versus those in the six September 2005 subsurface samples indicate that uranium-235 and uranium-238 activities are decreasing rapidly with depth at this site, which suggests that these radionuclides are confined to surface and near-surface soil. No total uranium samples were collected in 1999, so it is unknown whether concentrations of that metal are increasing or decreasing with depth at this site. However, the maximum total uranium concentration found at this site (29.1 mg/kg) was evaluated in the revised Feature 58TT risk assessment, discussed in Chapter 10.0 of this report.

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8.0 FEATURE 58YY CONCRETE PAD 1 SOIL SAMPLING

8.1 NMED RSI Comment (June 6, 2005) and SNL/NM RSI Response (August 2005)

7. Feature 58YY Concrete Pad 1:

The single soil sample collected at this feature had a lead concentration of 3,640 ppm. Additional soil sampling and analyses for metals and radionuclides should be performed to determine the horizontal and vertical extent of soil contamination.

Response: Three surface soil samples will be collected around the original Location ID S58UP1-GR-001-0-SS. In addition, a subsurface soil sample will be collected at a 2 ft depth at each of these three locations and at the original location. The surface samples will be analyzed for radionuclides by gamma spectroscopy, and the subsurface samples will be analyzed for lead only. A SAP was prepared to address the additional sampling activities, and is included as an attachment to this response.

8.2 Feature 58YY Concrete Pad 1 Soil Sample Collection and Analytical Results

The location of Feature 58YY is shown in Figure 2.2-1. On September 13, 2005, three surface soil samples were collected from locations 58UP1-GR-002, -003, and -004 (Figure 8.2-1) and four subsurface (2-foot-depth) primary soil samples and one duplicate were collected from all four sampling locations shown in Figure 8.2-1. The three surface and five subsurface soil samples were analyzed by GEL for radionuclides by gamma spectroscopy and lead, respectively. The analytical results for all January 1999 and September 2005 gamma spectroscopy and lead samples collected from Feature 58YY are presented in Tables 8.2-1 and 8.2-2, respectively. The MDLs for the September 2005 lead analyses are presented in Table 8.2-3.

8.3 Feature 58YY Concrete Pad 1 Soil Sampling Results and Conclusions

As shown in Table 8.2-1, thorium-232 activities were slightly above background in two of the three September 2005 surface soil samples, and activities of the other three representative radionuclides were either below background or not detected in these samples. The complete gamma spectroscopy analytical reports for these four samples are presented in Annex A. The four radionuclide samples that have been collected at this site in January 1999 and again in September 2005 indicate that significant radionuclide activity levels are not present in surface soil at Feature 58YY.

As shown in Table 8.2-2, lead concentrations were below background in all five subsurface soil samples collected from this site in September 2005, compared to the 3,640 mg/kg of lead detected in the single January 1999 surface soil sample from Feature 58YY. The September 2005 soil sample results demonstrate that significant lead concentrations are not present in the subsurface at this site.

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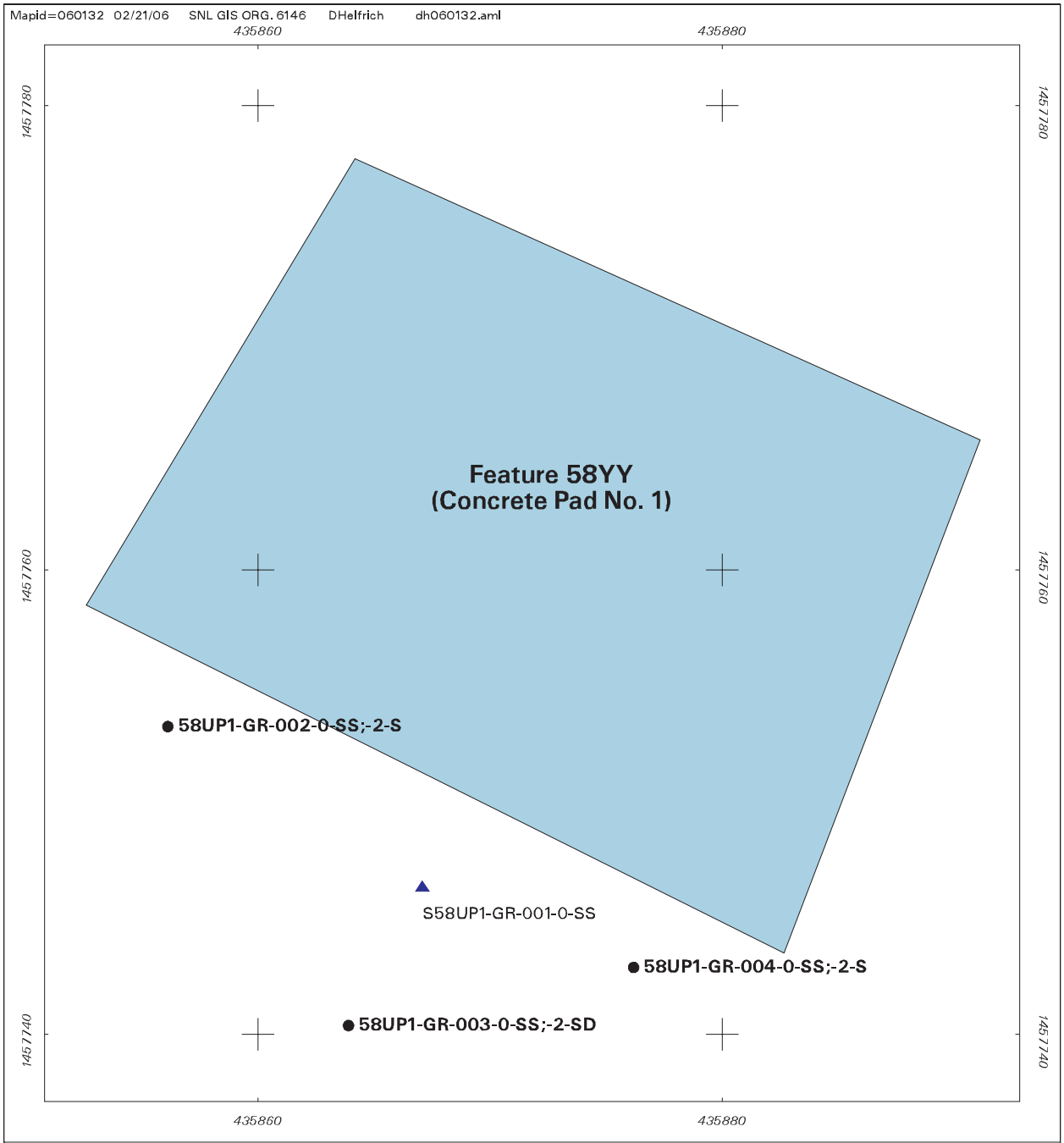

Legend

- January 1999 and September 2005 Sample Location
- September 2005 Sample Location (in bold font)
- Concrete Pad #1

Figure 8.2-1
Soil Sample Locations at Feature 58YY Concrete Pad No. 1, SWMU 58, Coyote Canyon Blast Area

0 3.5 7
Scale in Feet

0 0.84 1.68
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 A5

Table 8.2-1
Summary of Confirmatory Soil Sampling, Feature 58YY Concrete Pad 1 at SWMU 58
Coyote Canyon Blast Area, Gamma Spectroscopy Analytical Results
January 1999 and October 2005
(Off-Site Laboratory)

Sample Attributes			Activity (Method HASL-300[a]) (pCi/g)							
Record Number[b]	ER Sample ID	Sample Depth (ft)	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
			Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
January 1999 Soil Sample										
601311	S58UP1-GR-001-0-SS	0	0.271	0.211	0.878	0.465	**ND (0.197)**	--	ND (0.536)	--
September 2005 Soil Samples										
608870	58UP1-GR-002-0-SS	0	ND (0.0156)	--	**1.09**	0.032	ND (0.105)	--	0.788	0.632
608870	58UP1-GR-003-0-SS	0	0.203	0.0189	**1.06**	0.0336	ND (0.113)	--	0.99	0.694
608870	58UP1-GR-004-0-SS	0	0.365	0.0314	0.948	0.0399	ND (0.129)	--	ND (0.807)	--
Background activity-Lower Canyons Area[d]			1.55	NA	1.03	NA	0.16	NA	2.31	NA

Note: Values in **bold** exceed background activities, or have MDAs that exceed background activities.
[a]HASL/EML 1997.
[b]Analysis request/chain-of-custody record.
[c]Two standard deviations about the mean detected activity.
[d]Dinwiddie September 1997.
EML = Environmental Measurements Laboratory.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
HASL = Health and Safety Laboratory.
ID = Identification.
MDA = Minimum detectable activity.
NA = Not applicable.
ND ( ) = Not detected above the MDA, shown in parentheses.
ND ( ) = Not detected, but the MDA (shown in parentheses) exceeds the background activity.
pCi/g = Picocurie(s) per gram.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not calculated for nondetect results.

Table 8.2-2
Summary of Confirmatory Soil Sampling, Feature 58YY Concrete Pad 1 at SWMU 58
Coyote Canyon Blast Area, Lead Analytical Results
January 1999 and September 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Methods 6010B and 7471A [1999 sample] and 3005/3050 [2005 samples])[a] (mg/kg)
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead
January 1999 Soil Sample			
601310	S58UP1-GR-001-0-SS	0	**3,640**
September 2005 Soil Samples			
608870	58UP1-GR-001-2-S	2	6.87
608870	58UP1-GR-002-2-S	2	7.04
608870	58UP1-GR-003-2-S	2	7.95
608870	58UP1-GR-003-2-SD	2	9.48
608870	58UP1-GR-004-2-S	2	5.73
Background Concentration—Canyons Area[c]			18.9
September 2005 Quality Assurance/Quality Control Sample (mg/L)			
608870	58UP1-GR-003-0-EB		0.000916 J (0.002)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Garcia November 1998.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
S = Soil sample.
SD = Sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table 8.2-3
Confirmatory Soil Sampling, Feature 58YY Concrete Pad 1 at SWMU 58
Coyote Canyon Blast Area, Lead Analytical MDLs
September 2005
(Off-Site Laboratory)

Analyte	EPA Method 3005/3050[a] Detection Limit (mg/kg)
Lead	0.0988–0.1

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.

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9.0 SOIL SAMPLING QUALITY ASSURANCE/QUALITY CONTROL SAMPLES AND DATA VALIDATION RESULTS

During the SWMU 8 and 58 September and October 2005 sampling events, quality assurance (QA)/quality control (QC) samples were collected. As shown in the individual sample analytical data summary tables for each of the SWMU 8 and 58 features presented in this supplemental response, samples collected included both soil sample duplicate and equipment blank (EB) samples. This chapter summarizes the QA/QC samples collected and the data validation results.

9.1 Quality Assurance/Quality Control Samples

9.1.1 Duplicate Samples

As specified in the August 2005 SAP (SNL/NM August 2005) and as shown in the individual analytical data summary tables for each of the SWMU 8 and 58 features, one duplicate sample was collected at each of the individual SWMU 8 and 58 features from which additional environmental samples were collected, except for the Feature 58FF fire brick area. At Feature 58FF, one duplicate sample was collected from each of the eight 100-foot-deep boreholes drilled at the site. A total of 143 primary and 14 duplicate samples were collected during the September and October sampling events, resulting in an overall duplicate sample collection rate of 1 duplicate per approximately 10 primary samples.

Relative percent differences (RPDs) were calculated for the metals detected in the primary and duplicate sample pairs, which were analyzed by GEL (Table 9.1-1). The analyses of the sample pairs for arsenic, beryllium, lead, nickel, uranium, and zinc yielded 3 out of 39 RPDs that exceeded the generally acceptable RPD goal of 20 percent or less variability of reported metals concentrations between the primary and duplicate soil sample pair (EPA November 1986). Although five of the RPDs presented in Table 9.1-1 exceed the 20-percent RPD variability limit, the values are typical of metals distribution in heterogeneous soil samples and are therefore acceptable.

9.1.2 Equipment Blank Samples

As specified in the August 2005 SAP, and as shown in the individual sample analytical data summary tables, a total of 13 aqueous EB samples were collected during the September and October 2005 sampling events. Four EB samples were collected at four of the five SWMU 58 Features (58O, 58S, 58TT, and 58YY) sampled in September 2005. EBs were also collected at the conclusion of sampling from each of the eight Feature 58FF deep boreholes and the Feature 58OO borehole in October 2005. All EB samples were analyzed by GEL for the same nonradiological analytical suite as the confirmatory soil samples collected from each site. Twelve of the thirteen samples were analyzed for various metals including arsenic, barium, beryllium, lead, nickel, and zinc, and the thirteenth sample from Feature 58S was analyzed for HE compounds. Metals were detected at very low concentrations slightly above the MDLs for

Table 9.1-1
Summary of SWMU 8 and 58 Field Duplicate Relative Percent Difference Values for Metals Analyses of Confirmatory Soil Samples Collected in September and October 2005 (Off-Site Laboratory)

Sample Attributes			Primary and Duplicate Sample Metals Concentrations (mg/kg)					
Record Number[a]	ER Sample ID	Sample Depth (ft)	Arsenic	Beryllium	Lead	Nickel	Uranium	Zinc
608867	58O-GR-100-0-SS	0	NR	NR	NR	NR	NR	68.4
	58O-GR-100-0-SD	0	NR	NR	NR	NR	NR	61
	58O-GR-100-0: RPD[b]	NA	NA	NA	NA	NA	NA	11.44%
608868	58X-GR-102-2-S	2	NR	NR	NR	NR	1.17	NR
	58X-GR-102-2-SD	2	NR	NR	NR	NR	1.63	NR
	58X-GR-102-2: RPD	NA	NA	NA	NA	NA	**32.86%**	NA
608871	58FF-GR-BH8-010-S	10	4.04	0.926	8.98	11.3	NR	NR
	58FF-GR-BH8-010-SD	10	3.65	0.934	7.98	11.3	NR	NR
	58FF-GR-BH8-010: RPDs	NA	10.14%	0.86%	11.79%	0.00%	NA	NA
608872	58FF-GR-BH9-010-S	10	16.9	0.407	8.16	10.1	NR	NR
	58FF-GR-BH9-010-SD	10	3.46	0.425	9.06	11.3	NR	NR
	58FF-GR-BH9-010: RPDs	NA	**132.02%**	4.33%	10.45%	11.21%	NA	NA
608873	58FF-GR-BH10-010-S	10	3.26	0.515	8.17	11.7	NR	NR
	58FF-GR-BH10-010-SD	10	2.58	0.507	8.08	12.1	NR	NR
	58FF-GR-BH10-010: RPDs	NA	**23.29%**	1.57%	1.11%	3.36%	NA	NA
608874	58FF-GR-BH11-010-S	10	4.9	0.529	12.8	13	NR	NR
	58FF-GR-BH11-010-SD	10	4.95	0.54	10.4	12.9	NR	NR
	58FF-GR-BH11-010: RPDs	NA	1.02%	2.06%	**20.69%**	0.77%	NA	NA
608875	58FF-GR-BH12-010-S	10	2.94	0.422	7.32	10.8	NR	NR
	58FF-GR-BH12-010-SD	10	2.86	0.51	7.09	10.4	NR	NR
	58FF-GR-BH12-010: RPDs	NA	2.76%	18.88%	3.19%	3.77%	NA	NA
608876	58FF-GR-BH13-010-S	10	2.93	0.445	7.62	11.3	NR	NR
	58FF-GR-BH13-010-SD	10	3.43	0.479	8.28	10.5	NR	NR
	58FF-GR-BH13-010: RPDs	NA	15.72%	7.36%	8.30%	7.34%	NA	NA
608877	58FF-GR-FF-070-S	70	18.6	1.04	9	20.8	NR	NR
	58FF-GR-FF-070-SD	70	18.9	1.06	10.3	21.3	NR	NR
	58FF-GR-FF-070: RPDs	NA	1.60%	1.90%	13.47%	2.38%	NA	NA
608878	58FFC-BH-001-070-S	70	20.6	1.08	8.58	17.6	NR	NR
	58FFC-BH-001-070-SD	70	23.3	1.16	9.02	17.3	NR	NR
	58FFC-BH-001-070: RPDs	NA	12.30%	7.14%	5.00%	1.72%	NA	NA
608880	5800-GR-045-S	45	6.92	1.22	NR	NR	NR	73.9
	5800-GR-045-SD	45	7.82	1.38	NR	NR	NR	75.4
	5800-GR-045: RPDs	NA	12.21%	12.31%	NA	NA	NA	2.01%
608869	58FB2-GR-008-0-SS	0	NR	NR	10.7	NR	NR	NR
	58FB2-GR-008-0-SD	0	NR	NR	14.5	NR	NR	NR
	58FB2-GR-008-0: RPD	NA	NA	NA	**30.16%**	NA	NA	NA
608870	58UP1-GR-003-2-S	2	NR	NR	7.95	NR	NR	NR
	58UP1-GR-003-2-SD	2	NR	NR	9.48	NR	NR	NR
	58UP1-GR-003-2: RPD	NA	NA	NA	17.56%	NA	NA	NA

Note: RPD values in **bold** exceed the generally acceptable RPD goal of 20%.

[a]Analysis request/chain-of-custody record.

[b]RPD calculated as follows: $[(X_1 - X_2)/((X_1 + X_2)/2)] \times 100$ where X_1 and X_2 are the metals concentrations in the primary and duplicate samples, respectively.

ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligrams per kilogram.
NA = Not applicable.
NR = Not reported. Sample not analyzed for this analyte.
RPD = Relative percent difference.
SD = Sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

barium, lead, or zinc in eight of the twelve metals EB samples, and HE compounds were not detected in the thirteenth EB from Feature 58S. The very low detected metals concentrations in these EBs indicate that equipment decontamination procedures utilized during collection of the September and October samples were acceptable, and that transfer of contaminants between sampling locations from reusable sampling equipment did not occur.

9.2 Data Validation Results

All laboratory data were reviewed and verified/validated according to "Data Validation Procedure for Chemical and Radiochemical Data," Administrative Operating Procedure (AOP) 00-03, Rev. 01 (SNL/NM December 2003). Annex B contains the data validation reports for the samples collected in September and October 2005 from SWMUs 8 and 58. The data are acceptable for use in this request for a determination of CAC without controls.

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10.0 SWMUs 8 AND 58 REVISED RISK ASSESSMENT DISCUSSION

The risk assessment for SWMUs 8 and 58 presented in the April 2005 CAC proposal (SNL/NM April 2005) was updated with the additional September and October 2005 sampling data discussed in this supplemental response for both maximum and upper confidence limit (UCL) of the mean concentrations, where appropriate. The following summarizes the results of the additional data inclusion:

- Feature 58O – The September 2005 analytical data for barium was added to the SWMUs 8 and 58 Combination Area data set and the UCL of the mean concentration was recalculated. No maximum concentrations were impacted and zinc was not a risk driver; therefore no UCL calculation was required for zinc.

- Feature 58S – The September 2005 analytical data for 2,4,6-trinitrotoluene was added to the SWMUs 8 and 58 Combination Area data set and the UCL of the mean concentration was recalculated. No maximum concentrations were impacted and 4-amino-2,6-dinitrotoluene was not a risk driver; therefore no UCL calculation was required for 4-amino-2,6-dinitrotoluene.

- Feature 58X – The September 2005 analytical data for uranium as a metal was added to the SWMUs 8 and 58 Combination Area data set and the maximum concentration of 41 mg/kg was evaluated in the revised risk assessment for the SWMUs 8 and 58 Combination Area. No other maximum concentrations or activities were impacted based upon the September 2005 sampling from Feature 58X.

- Feature 58FF – The September 2005 analytical data for arsenic, beryllium, lead, and nickel from the eight 100-foot-deep boreholes drilled at this site were added to both the Feature 58FF and SWMUs 8 and 58 Combination Area data sets. The UCL of the mean concentrations for these four metals were recalculated for both data sets. However, as discussed in Section 5.3, it is considered highly unlikely that the known surface testing activities conducted at Feature 58FF would have resulted in metals contamination in the deep subsurface at the site. For this reason, the above-background arsenic, beryllium, lead, and nickel concentrations starting at approximately 30 feet bgs in all of the eight deep boreholes drilled at this site are considered to be naturally occurring. Therefore, based upon professional judgment, analytical data for samples collected at depths of 30 feet bgs or greater were not included in the UCL calculations. In addition, all historical analytical data for these metals at depths of 30 feet bgs and greater were also removed prior to the UCL recalculation. The maximum concentrations of the four metals of concern in samples collected above a depth of 30 feet bgs were reevaluated for both Feature 58FF and the SWMUs 8 and 58 Combination Area data sets.

- Feature 58OO – As discussed in Section 6.3, there are no known activities conducted at Feature 58OO that would have resulted in a steady increase in metals concentrations with depth at this site. The above-background metals concentrations detected in the deep subsurface alluvium and bedrock are also believed to be naturally occurring. Therefore, all of the October 2005 analytical

data for the three metals of concern (arsenic, beryllium, and zinc) from samples collected at depths of 30 feet bgs and greater at this site were also not included in the UCL calculations. For radionuclides, no maximum activities were impacted based on the October 2005 sampling.

- Feature 58TT – The September 2005 analytical data for lead was added to the SWMUs 8 and 58 Combination Area data set and the UCL of the mean concentration was recalculated. The maximum lead concentration utilized in the previous risk assessment (15,000 mg/kg) was not impacted for either the Feature 58TT or the SWMUs 8 and 58 Combination Area risk assessments; therefore, neither risk assessment needs to be revised based upon the Feature 58TT additional 2005 lead sampling. However, the Feature 58TT risk assessment was revised to include uranium as a potential contaminant based upon the September 2005 maximum uranium concentration of 29.1 mg/kg. For radionuclides, no maximum activities were impacted based upon the September 2005 sampling.

- Feature 58YY – The September 2005 analytical data for lead was added to the SWMUs 8 and 58 Combination Area data set and the UCL of the mean concentration was recalculated. For radionuclides, no maximum activities for the risk assessment for the SWMUs 8 and 58 Combination Area were impacted based upon the October 2005 sampling.

The nonradiological risk assessment results for the SWMUs 8 and 58 Combination Area, Feature 58FF, and Feature 58TT are summarized in the following sections (the radiological risk assessments previously submitted in the CAC proposal [SNL/NM April 2005] for SWMUs 8 and 58 were not impacted). In addition, the September and October 2005 sampling was either deeper than 5 feet bgs or COCs detected in samples collected from less than or equal to 5-foot depths did not vary from the historical analytical data. Therefore, the ecological results from the original April 2005 risk assessment were not impacted.

10.1 SWMUs 8 and 58 Combination Area Revised Risk Assessment

The maximum concentration value for lead is 15,000 mg/kg. The U.S. Environmental Protection Agency (EPA) intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for construction and industrial land-use scenarios are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is greater than all the screening values. However, because the site has been adequately characterized; average concentrations are more representative of actual site conditions. The UCL of the mean concentration for lead is 293 mg/kg (revised based upon the 2005 sampling) (Annex C). The UCL of the mean value for lead at this site is less than all of the screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

Using conservative assumptions and a reasonable maximum exposure (RME) approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the hazard index (HI) (0.96) is lower than the accepted numerical guidance from the EPA (Table 10.1-1). The estimated excess cancer risk is 9E-5. Thus, excess cancer risk is

Table 10.1-1
Risk Assessment Values for Nonradiological COCs, SWMUs 8 and 58 Combination Area

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	137 J	0.54	9E-5	6.33	4E-4
Barium	988 J	0.02	--	0.19	--
Beryllium	79.3	0.04	3E-8	0.53	7E-8
Cadmium	6.02	0.01	2E-9	0.15	4E-9
Chromium, total	161 J	0.00	--	0.00	--
Copper	684	0.02	--	0.24	--
Mercury	0.585	0.00	--	0.03	--
Nickel	3,960	0.21	--	2.60	--
Selenium	79 J	0.02	--	0.21	--
Silver	60.5	0.01	--	0.16	--
Uranium	41	0.01	--	0.18	--
Zinc	225	0.00	--	0.01	--
Organic					
Acetone	0.021	0.00	--	0.00	--
2-Amino-4,6-dinitrotoluene	0.45 J	0.00	--	0.01	--
4-Amino-2,6-dinitrotoluene	0.68	0.00	--	0.01	--
Benzo(a)pyrene	0.235 J	0.00	1E-6	0.00	4E-6
Benzo(b)anthracene	0.202 J	0.00	1E-7	0.00	3E-7
2-Butanone	0.075	0.00	--	0.00	--
Chloroform	0.0025[b]	0.00	5E-9	0.00	1E-8
Chrysene	0.248 J	0.00	1E-9	0.00	4E-9
Diethyl phthalate	0.269 J	0.00	--	0.00	--
m-Dinitrobenzene	0.15	0.00	--	0.02	--
2,4-Dinitrotoluene	0.36 J	0.00	--	0.00	--
Ethylbenzene	0.0005[b]	0.00	3E-11	0.00	7E-11
bis(2-Ethylhexyl) phthalate	3.41	0.00	2E-8	0.00	8E-8
Fluoranthene	0.278 J	0.00	--	0.00	--
2-Hexanone	0.0157	0.00	--	0.00	--
HMX	5.6 J	0.00	--	0.00	--
Methylene chloride	0.0125[b]	0.00	8E-8	0.00	2E-7
n-Nitrosodiphenylamine	0.253 J	0.00	7E-10	0.00	3E-9
Pentachlorophenol	0.27 J	0.00	1E-8	0.00	5E-8
Pyrene	0.334 J	0.00	--	0.00	--
RDX	19.9 J	0.01	1E-6	0.11	5E-6
Toluene	0.025	0.00	--	0.00	--
2,4,6-Trinitrotoluene	20 J	0.06	3E-7	0.65	1E-6
Total		0.96	9E-5	11.43	4E-4

[a]EPA 1989.
[b]Maximum concentration is one-half the detection limit.

COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Analytical result was qualified as an estimated concentration.
mg/kg = Milligram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
-- = Information not available.

above the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.91 and the incremental excess cancer risk is 8.30E-5 for the industrial land-use scenario. The incremental HI risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk (summarized in Annex C) reduces the total and estimated incremental excess cancer risk to 1E-6 and 9.80E-7, respectively. For the SWMUs 8 and 58 Combination Area, the COCs that contribute to the overall risk and the UCLs of the mean concentrations calculated for these COCs are as follows:

- Arsenic, 9.37 mg/kg (revised based upon 2005 sampling, below background and eliminated from further evaluation)
- Barium, 158 mg/kg (revised based upon 2005 sampling, below background and eliminated from further evaluation)
- Beryllium, 2.30 mg/kg (revised based upon 2005 sampling)
- Cadmium, 0.62 mg/kg (below background and eliminated from further evaluation)
- Copper, 51.2 mg/kg
- Nickel, 77.4 mg/kg (revised based upon 2005 sampling)
- Selenium, 6.65 mg/kg
- Silver, 2.74 mg/kg
- Benzo(a)pyrene, 0.12 mg/kg
- RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine), 2.66 mg/kg
- 2,4,6-trinitrotoluene, 1.59 mg/kg (revised based upon 2005 sampling)

The UCL values were calculated using only the analytical data from the areas, or sampling events, where the specific risk driver was detected (i.e., areas for which analytical data were 100-percent nondetections for a given COC were not included in the calculation). This approach is conservative because the calculation data set is not “diluted” by the inclusion of a significant number of nondetections from areas of SWMUs 8 and 58 where the specific COC is not present. Consequently, the UCL concentrations listed are higher than those calculated using the entire SWMUs 8 and 58 analytical data set. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental excess cancer risks for the industrial land-use scenario are below NMED guidelines.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (11.43) is above the

accepted numerical guidance from the EPA (Table 10.1-1). The estimated excess cancer risk is 4E-4. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 10.88 and the incremental excess cancer risk is 3.37E-4 for the residential land-use scenario. The incremental risk calculations indicate potential risk to human health for the residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk and hazards (summarized in Annex C) reduces the total HI and estimated excess cancer risk to 0.25 and 3E-6, respectively. The incremental HI and excess cancer risk are reduced to 0.23 and 3.28E-6, respectively. The COCs for the SWMUs 8 and 58 Combination Area that contribute to the overall risk and hazards and the UCLs of the mean concentrations calculated for these COCs are the bulleted items listed in Section 10.1 of this document. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and the estimated incremental excess cancer risk values for the residential land-use scenario are below NMED guidelines.

10.2 Feature 58FF Revised Risk Assessment

The maximum concentration value for lead is 15,000 mg/kg. As explained in Section 10.1, the maximum concentration value for lead at this site is greater than all the EPA and NMED screening values. However, because the site has been adequately characterized; average concentrations are more representative of actual site conditions. The UCL of the mean concentration for lead at Feature 58TT is 751 mg/kg (Annex C). The UCL value for lead at this site is less than the industrial screening values. Therefore, lead is eliminated from consideration in the human health risk assessment for the industrial land-use scenario only.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the HI (0.67) is lower than the accepted numerical guidance from the EPA (Table 10.2-1). The estimated excess cancer risk is 6E-5. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.62 and the incremental excess cancer risk is 5.86E-5 for the industrial land-use scenario. The incremental HI risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk (summarized in Annex C), arsenic (9.51 mg/kg; below background and eliminated from further evaluation), beryllium (5.87 mg/kg), and nickel (195 mg/kg), reduces the total and estimated incremental excess cancer risk values to 8E-9 and 7.10E-9, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental excess cancer risk values for the industrial land-use scenario are below NMED guidelines.

Table 10.2-1
Risk Assessment Values for SWMU 58 Nonradiological COCs,
Feature 58FF Fire Brick Area

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	103 J	0.40	6E-5	4.76	3E-4
Barium	585 J	0.01	--	0.11	--
Beryllium	79.3	0.04	3E-8	0.53	7E-8
Cadmium	0.875	0.00	3E-10	0.02	6E-10
Chromium, total	161 J	0.00	--	0.00	--
Copper	62.1 J	0.00	--	0.02	--
Mercury	0.273	0.00	--	0.01	--
Nickel	3,960	0.21	--	2.60	--
Silver	1.0[b]	0.00	--	0.00	--
Zinc	108 J	0.00	--	0.00	--
Organic					
Chloroform	0.0025[b]	0.00	5E-9	0.00	1E-8
Total		0.67	6E-5	8.07	3E-4

[a]EPA 1989.
[b]Maximum concentration is one-half the detection limit.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
J = Analytical result was qualified as an estimated concentration.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
-- = Information not available.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (8.07) is above the accepted numerical guidance from the EPA (Table 10.2-1). The estimated excess cancer risk is 3E-4. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 7.52 and the incremental excess cancer risk is 2.4E-4 for the residential land-use scenario. These incremental risk calculations indicate potential risk to human health for the residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk and hazards (summarized in Annex C), arsenic (9.51 mg/kg; below background and eliminated from further evaluation), beryllium (5.87 mg/kg), and nickel (195 mg/kg), reduces the total HI and estimated excess cancer risk values to 0.34 and 2E-8, respectively. The incremental HI and excess cancer risk values are reduced to 0.25 and 1.51E-8, respectively. Thus, by using realistic concentrations in the risk calculations that

more accurately depict actual site conditions, both the total and incremental HI and estimated excess cancer risk values for the residential land-use scenario are below NMED guidelines.

10.3 Feature 58TT Revised Risk Assessment

The maximum concentration value for lead is 78.8 mg/kg. As explained in Section 10.1, the maximum concentration value for lead at this site is less than all the EPA and NMED screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the HI (0.01) is lower than the accepted numerical guidance from the EPA (Table 10.3-1). There are no quantified estimated cancer risks. Thus, excess cancer risk is below the acceptable risk value provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.01 for the industrial land-use scenario. The incremental risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (0.12) is below the accepted numerical guidance from the EPA (Table 10.3-1). There are no quantified estimated cancer risks. Thus, excess cancer risk is below the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 0.11 for the residential land-use scenario. The incremental risk calculations indicate insignificant risk to human health for the residential land-use scenario.

Table 10.3-1
Risk Assessment Values for SWMU 58 Nonradiological Background Constituents,
Feature 58TT Fire Brick Area

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Uranium	29.1	0.01	--	0.12	--
Total		0.01	--	0.12	--

[a]EPA 1989.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
-- = Information not quantified.

10.4 Recommendation for Corrective Action Complete Without Controls Determination

Based upon the SWMUs 8 and 58 field investigation data and the corresponding human health and ecological risk assessments, a risk-based determination of CAC without controls is recommended for SWMUs 8 and 58 as a whole, and for the individual Features 58FF and 58X evaluated in this RSI supplemental response for the following reasons:

- The soil has been sampled for all potential COCs.
- No COCs are present in the soil at levels considered hazardous to human health for either an industrial or residential land-use scenario.
- None of the COCs warrant an ecological assessment because the ecological risks are acceptable based upon NMED guidance.

This is consistent with the NMED's No Further Action Criterion 5, which states, "the SWMU/AOC [Area of Concern] has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use" (NMED March 1998).

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ANNEX A
SWMUs 8 and 58
Complete Analytical Reports, Radionuclides by Gamma Spectroscopy for Samples Collected from Features 58OO and 58YY, September and October 2005

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Company : Sandia National Laboratories
Address : MS–0756, Org. 7578, Bldg. 823/
1515 Eubank SE
Albuquerque, New Mexico 87123
Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070376–010
Sample ID: 148808015
Matrix: Soil
Collect Date: 25–OCT–05
Receive Date: 27–OCT–05
Collector: Client

Project: SNLS00401
Client ID: SNLS002

Client Desc.: 5800–GR–040–S

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Actinium–228		1.07	0.0354	+/–0.186	0.0738	pCi/g		JPH1 11/18/05	2300	477134 1
Americium–241	U	–0.0254	0.0597	+/–0.0776	0.122	pCi/g				
Antimony–124	U	0.00763	0.0224	+/–0.0255	0.0485	pCi/g				
Antimony–125	U	0.0112	0.0261	+/–0.0294	0.0538	pCi/g				
Barium–133	U	–0.00181	0.0118	+/–0.0161	0.0243	pCi/g				
Beryllium–7	U	–0.0146	0.0983	+/–0.113	0.203	pCi/g				
Bismuth–211	X	2.49	0.0539	+/–0.256	0.111	pCi/g				
Bismuth–212		0.743	0.0791	+/–0.193	0.164	pCi/g				
Bismuth–214		0.775	0.0177	+/–0.0917	0.0367	pCi/g				
Cadmium–109	X	2.28	0.212	+/–0.452	0.432	pCi/g				
Cerium–139	U	–0.00696	0.0086	+/–0.00993	0.0175	pCi/g				
Cerium–141	U	–0.00653	0.0211	+/–0.0239	0.043	pCi/g				
Cerium–144	U	0.0116	0.0602	+/–0.0672	0.123	pCi/g				
Cesium–134	U	0.0465	0.014	+/–0.0191	0.0465	pCi/g				
Cesium–137	U	–0.0143	0.0104	+/–0.0129	0.0215	pCi/g				
Chromium–51	U	0.0995	0.134	+/–0.157	0.274	pCi/g				
Cobalt–57	U	–0.00144	0.0075	+/–0.00838	0.0153	pCi/g				
Cobalt–60	U	0.00361	0.0119	+/–0.014	0.025	pCi/g				
Europium–152	U	–0.0076	0.0267	+/–0.0323	0.0548	pCi/g				
Europium–154	U	–0.0378	0.0386	+/–0.0557	0.0803	pCi/g				
Iron–59	U	0.019	0.0318	+/–0.0637	0.0661	pCi/g				
Lead–211	U	0.0515	0.261	+/–0.334	0.536	pCi/g				
Lead–212		1.01	0.0154	+/–0.0968	0.0315	pCi/g				
Lead–214		0.867	0.0188	+/–0.0995	0.0386	pCi/g				
Manganese–54	U	0.020	0.012	+/–0.0154	0.0248	pCi/g				
Mercury–203	X	0.0273	0.013	+/–0.0211	0.0265	pCi/g				
Neptunium–237	X	0.662	0.063	+/–0.187	0.128	pCi/g				
Neptunium–239	U	–0.00189	0.0554	+/–0.0616	0.113	pCi/g				
Niobium–95	U	0.0096	0.0157	+/–0.0368	0.0326	pCi/g				
Potassium–40		24.6	0.0961	+/–1.83	0.204	pCi/g				
Protactinium–231	U	0.394	0.436	+/–0.507	0.892	pCi/g				
Protactinium–233	U	–0.0129	0.0169	+/–0.0206	0.0347	pCi/g				
Protactinium–234	U	–0.0237	0.0941	+/–0.110	0.195	pCi/g				
Radium–223	U	–0.066	0.183	+/–0.249	0.375	pCi/g				
Radium–224	X	3.07	0.176	+/–0.538	0.358	pCi/g				
Radium–226		0.775	0.0177	+/–0.0917	0.0367	pCi/g				
Radium–228		1.07	0.0354	+/–0.186	0.0738	pCi/g				
Radon–219	U	0.0486	0.115	+/–0.204	0.237	pCi/g				

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070376–010
Sample ID: 148808015

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Rhodium–106	U	0.0446	0.0948	+/–0.124	0.196	pCi/g				
Ruthenium–103	U	0.00272	0.0131	+/–0.015	0.027	pCi/g				
Ruthenium–106	U	0.117	0.0918	+/–0.144	0.190	pCi/g				
Selenium–75	U	0.012	0.0132	+/–0.0152	0.027	pCi/g				
Sodium–22	U	–0.0136	0.0139	+/–0.020	0.0289	pCi/g				
Strontium–85	U	0.0326	0.0118	+/–0.0141	0.0326	pCi/g				
Thallium–208		0.321	0.00989	+/–0.0371	0.0204	pCi/g				
Thorium–227	U	–0.0885	0.107	+/–0.128	0.218	pCi/g				
Thorium–231	X	0.279	0.0491	+/–0.086	0.100	pCi/g				
Thorium–232		0.989	0.0151	+/–0.0944	0.0307	pCi/g				
Thorium–234		1.29	0.464	+/–1.01	0.945	pCi/g				
Tin–113	U	–0.00469	0.0134	+/–0.0165	0.0275	pCi/g				
Uranium–235	U	0.108	0.0601	+/–0.0679	0.122	pCi/g				
Uranium–238		1.29	0.464	+/–1.01	0.945	pCi/g				
Yttrium–88	U	0.0143	0.00988	+/–0.0102	0.0214	pCi/g				
Zinc–65	U	0.0257	0.0287	+/–0.0372	0.0595	pCi/g				
Zirconium–95	U	0.0447	0.0225	+/–0.0302	0.0467	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	NXL1	10/28/05	0922	475995

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
TPU is calculated at the 95% confidence level (2–sigma).
The Qualifiers in this report are defined as follows :

* Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
** Indicates analyte is a surrogate compound.
B The analyte was found in the blank above the effective MDL.
H Analytical holding time was exceeded
J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070376–010
Sample ID: 148808015

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M

X Data rejected due to interference.
X Data rejected due to low abundance.
X Data rejected due to no valid peak.
X Uncertain identification for gamma spectroscopy.
d The 2:1 depletion requirement was not met for this sample
h Prep holding time exceeded
The above sample is reported on a dry weight basis.

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070378-010
Sample ID: 148808016
Matrix: Soil
Collect Date: 25-OCT-05
Receive Date: 27-OCT-05
Collector: Client

Project: SNLS00401
Client ID: SNLS002

Client Desc.: 5800-GR-050-S

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Actinium-228		0.598	0.0404	+/-0.107	0.0837	pCi/g		JPH1 11/18/05	2301	477134 I
Americium-241	U	-0.00763	0.0396	+/-0.0434	0.0806	pCi/g				
Antimony-124	U	-0.00848	0.0238	+/-0.0351	0.0512	pCi/g				
Antimony-125	U	0.0117	0.0251	+/-0.0291	0.0516	pCi/g				
Barium-133	U	0.00369	0.012	+/-0.0156	0.0246	pCi/g				
Beryllium-7	U	-0.116	0.0966	+/-0.119	0.199	pCi/g				
Bismuth-211	X	2.17	0.0547	+/-0.156	0.112	pCi/g				
Bismuth-212		0.428	0.0814	+/-0.134	0.169	pCi/g				
Bismuth-214		0.616	0.0181	+/-0.0511	0.0374	pCi/g				
Cadmium-109	X	1.94	0.179	+/-0.376	0.365	pCi/g				
Cerium-139	U	0.0061	0.00784	+/-0.0112	0.016	pCi/g				
Cerium-141	U	0.0138	0.019	+/-0.0293	0.0386	pCi/g				
Cerium-144	U	-0.0401	0.0534	+/-0.0624	0.109	pCi/g				
Cesium-134	U	0.0366	0.0135	+/-0.0185	0.0366	pCi/g				
Cesium-137	U	-0.0144	0.0101	+/-0.0122	0.0209	pCi/g				
Chromium-51	U	0.0749	0.129	+/-0.146	0.265	pCi/g				
Cobalt-57	U	-0.00149	0.00659	+/-0.00756	0.0134	pCi/g				
Cobalt-60	U	-0.0119	0.0115	+/-0.0144	0.0242	pCi/g				
Europium-152	U	-0.0039	0.0267	+/-0.0309	0.0547	pCi/g				
Europium-154	U	-0.0307	0.0376	+/-0.0459	0.0782	pCi/g				
Iron-59	U	-0.00866	0.0351	+/-0.0412	0.0727	pCi/g				
Lead-211	U	0.119	0.256	+/-0.296	0.526	pCi/g				
Lead-212		0.609	0.0148	+/-0.0377	0.0303	pCi/g				
Lead-214		0.754	0.0191	+/-0.0541	0.0391	pCi/g				
Manganese-54	U	0.00538	0.0115	+/-0.0134	0.0239	pCi/g				
Mercury-203	U	0.0208	0.0118	+/-0.0205	0.0242	pCi/g				
Neptunium-237	X	0.562	0.0529	+/-0.109	0.108	pCi/g				
Neptunium-239	U	-0.0544	0.0479	+/-0.0558	0.0976	pCi/g				
Niobium-95	U	0.0402	0.0185	+/-0.0311	0.0402	pCi/g				
Potassium-40		24.3	0.0944	+/-0.688	0.200	pCi/g				
Protactinium-231	U	0.181	0.406	+/-0.456	0.832	pCi/g				
Protactinium-233	U	-0.00264	0.0174	+/-0.0199	0.0356	pCi/g				
Protactinium-234	U	-0.0641	0.0925	+/-0.114	0.192	pCi/g				
Radium-223	U	-0.0512	0.176	+/-0.232	0.361	pCi/g				
Radium-224	X	2.06	0.170	+/-0.367	0.347	pCi/g				
Radium-226		0.616	0.0181	+/-0.0511	0.0374	pCi/g				
Radium-228		0.598	0.0404	+/-0.107	0.0837	pCi/g				
Radon-219	U	-0.0179	0.112	+/-0.131	0.229	pCi/g				
Rhodium-106		-0.034	0.0913	+/-0.106	0.189	pCi/g				

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070378-010
Sample ID: 148808016

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
	U									
Ruthenium-103	U	-0.00634	0.0126	+/-0.0153	0.026	pCi/g				
Ruthenium-106	U	-0.0192	0.0914	+/-0.106	0.189	pCi/g				
Selenium-75	U	0.00735	0.0125	+/-0.014	0.0256	pCi/g				
Sodium-22	U	-0.011	0.0135	+/-0.0165	0.0281	pCi/g				
Strontium-85	U	0.0464	0.0122	+/-0.0143	0.0464	pCi/g				
Thallium-208		0.202	0.0101	+/-0.0266	0.0208	pCi/g				
Thorium-227	U	-0.0136	0.0994	+/-0.112	0.203	pCi/g				
Thorium-231	U	0.130	0.0559	+/-0.106	0.130	pCi/g				
Thorium-232		0.594	0.0145	+/-0.0368	0.0296	pCi/g				
Thorium-234	U	0.591	0.337	+/-0.600	0.685	pCi/g				
Tin-113	U	-0.000517	0.0128	+/-0.0149	0.0262	pCi/g				
Uranium-235	U	0.0441	0.0552	+/-0.0933	0.112	pCi/g				
Uranium-238	U	0.591	0.337	+/-0.600	0.685	pCi/g				
Yttrium-88	U	0.00819	0.0104	+/-0.0115	0.0225	pCi/g				
Zinc-65	U	0.0423	0.0326	+/-0.0417	0.0673	pCi/g				
Zirconium-95	U	0.0102	0.0225	+/-0.0259	0.0466	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	NXL1	10/28/05	0922	475995

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
TPU is calculated at the 95% confidence level (2-sigma).
The Qualifiers in this report are defined as follows :

* Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
** Indicates analyte is a surrogate compound.
B The analyte was found in the blank above the effective MDL.
H Analytical holding time was exceeded
J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

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Report Date: November 23, 2005
Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Client Sample ID: 070378-010
Sample ID: 148808016
Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M

X Data rejected due to interference.
X Data rejected due to low abundance.
X Data rejected due to no valid peak.
X Uncertain identification for gamma spectroscopy.
d The 2:1 depletion requirement was not met for this sample
h Prep holding time exceeded
The above sample is reported on a dry weight basis.

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070380–010
Sample ID: 148808017
Matrix: Soil
Collect Date: 25–OCT–05
Receive Date: 27–OCT–05
Collector: Client

Project: SNLS00401
Client ID: SNLS002

Client Desc.: 5800–GR–060–S

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Actinium–228		0.511	0.0476	+/–0.136	0.0988	pCi/g		JPH1 11/21/05	2120	477134 1
Americium–241	U	0.0352	0.0555	+/–0.0728	0.113	pCi/g				
Antimony–124	U	0.00466	0.0319	+/–0.0383	0.0685	pCi/g				
Antimony–125	U	0.00574	0.0326	+/–0.0384	0.0669	pCi/g				
Barium–133	U	0.0116	0.0148	+/–0.0193	0.0303	pCi/g				
Beryllium–7	U	–0.0881	0.131	+/–0.159	0.269	pCi/g				
Bismuth–211	X	7.99	0.0688	+/–0.603	0.141	pCi/g				
Bismuth–212		0.471	0.101	+/–0.168	0.208	pCi/g				
Bismuth–214		2.42	0.0229	+/–0.217	0.0473	pCi/g				
Cadmium–109	X	3.02	0.271	+/–0.507	0.550	pCi/g				
Cerium–139	U	–0.0134	0.011	+/–0.0138	0.0223	pCi/g				
Cerium–141	U	0.0282	0.0285	+/–0.0319	0.0579	pCi/g				
Cerium–144	U	–0.0292	0.0736	+/–0.0902	0.150	pCi/g				
Cesium–134	U	0.0142	0.0152	+/–0.0284	0.0315	pCi/g				
Cesium–137	U	–0.0284	0.0126	+/–0.0166	0.0261	pCi/g				
Chromium–51	U	–0.0601	0.178	+/–0.210	0.364	pCi/g				
Cobalt–57	U	0.00944	0.00921	+/–0.011	0.0187	pCi/g				
Cobalt–60	U	0.00716	0.0152	+/–0.0177	0.0317	pCi/g				
Europium–152	U	–0.0183	0.0334	+/–0.0397	0.0683	pCi/g				
Europium–154	U	0.0188	0.0454	+/–0.0532	0.0946	pCi/g				
Iron–59	U	–0.0177	0.0418	+/–0.0501	0.0867	pCi/g				
Lead–211	U	0.334	0.340	+/–0.489	0.697	pCi/g				
Lead–212		0.604	0.0192	+/–0.0659	0.0391	pCi/g				
Lead–214		2.78	0.024	+/–0.253	0.0491	pCi/g				
Manganese–54	U	0.00646	0.0135	+/–0.0187	0.028	pCi/g				
Mercury–203	U	0.00181	0.0171	+/–0.0198	0.0348	pCi/g				
Neptunium–237	X	0.873	0.0827	+/–0.229	0.168	pCi/g				
Neptunium–239	U	0.0453	0.0671	+/–0.0803	0.136	pCi/g				
Niobium–95	U	0.0616	0.0243	+/–0.0309	0.0616	pCi/g				
Potassium–40		21.5	0.113	+/–1.55	0.240	pCi/g				
Protactinium–231	U	0.0718	0.536	+/–0.622	1.09	pCi/g				
Protactinium–233	U	0.0184	0.0229	+/–0.0263	0.0468	pCi/g				
Protactinium–234	U	–0.0807	0.110	+/–0.133	0.228	pCi/g				
Radium–223	U	–0.133	0.234	+/–0.278	0.478	pCi/g				
Radium–224	X	5.80	0.219	+/–0.589	0.445	pCi/g				
Radium–226		2.42	0.0229	+/–0.217	0.0473	pCi/g				
Radium–228		0.511	0.0476	+/–0.136	0.0988	pCi/g				
Radon–219	U	0.143	0.153	+/–0.187	0.313	pCi/g				
Rhodium–106		0.0126	0.110	+/–0.132	0.227	pCi/g				

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Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070380–010
Sample ID: 148808017

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
	U									
Ruthenium–103	U	0.0262	0.017	+/–0.0264	0.035	pCi/g				
Ruthenium–106	U	0.0392	0.111	+/–0.132	0.228	pCi/g				
Selenium–75	U	–0.00197	0.016	+/–0.0186	0.0326	pCi/g				
Sodium–22	U	0.00659	0.0163	+/–0.0192	0.0341	pCi/g				
Strontium–85	U	0.0488	0.016	+/–0.0198	0.0488	pCi/g				
Thallium–208		0.165	0.0127	+/–0.0411	0.0262	pCi/g				
Thorium–227	U	0.223	0.132	+/–0.243	0.269	pCi/g				
Thorium–231	X	0.213	0.0619	+/–0.122	0.126	pCi/g				
Thorium–232		0.587	0.0187	+/–0.0641	0.0381	pCi/g				
Thorium–234		1.89	0.474	+/–0.957	0.961	pCi/g				
Tin–113	U	0.00298	0.0166	+/–0.0222	0.034	pCi/g				
Uranium–235	U	0.120	0.0787	+/–0.132	0.160	pCi/g				
Uranium–238		1.89	0.474	+/–0.957	0.961	pCi/g				
Yttrium–88	U	0.00101	0.012	+/–0.0146	0.0261	pCi/g				
Zinc–65	U	0.00326	0.0328	+/–0.0444	0.0681	pCi/g				
Zirconium–95	U	–0.00572	0.0282	+/–0.0348	0.0585	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	NXL1	10/28/05	0922	475995

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3
2	EML HASL 300, 4.5.2.3

Notes:
TPU is calculated at the 95% confidence level (2–sigma).
The Qualifiers in this report are defined as follows :

* Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
** Indicates analyte is a surrogate compound.
B The analyte was found in the blank above the effective MDL.
H Analytical holding time was exceeded
J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the

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Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070380-010
Sample ID: 148808017

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M

effective MDL. For radiochemical analytes the result is less than the Decision Level
X Data rejected due to interference.
X Data rejected due to low abundance.
X Data rejected due to no valid peak.
X Uncertain identification for gamma spectroscopy.
d The 2:1 depletion requirement was not met for this sample
h Prep holding time exceeded
The above sample is reported on a dry weight basis.

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070382–010
Sample ID: 148808018
Matrix: Soil
Collect Date: 25–OCT–05
Receive Date: 27–OCT–05
Collector: Client

Project: SNLS00401
Client ID: SNLS002

Client Desc.: 5800–GR–070–S

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch	M
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid (Long List)											
Actinium–228		0.533	0.0425	+/–0.0983	0.0876	pCi/g		JPH1 11/21/05	2126	477134	1
Americium–241	U	–0.0423	0.0485	+/–0.0575	0.0983	pCi/g					
Antimony–124	U	0.0452	0.029	+/–0.047	0.0614	pCi/g					
Antimony–125	U	–0.00914	0.0306	+/–0.0349	0.0626	pCi/g					
Barium–133	U	–0.00437	0.0128	+/–0.0174	0.0261	pCi/g					
Beryllium–7	U	–0.0972	0.112	+/–0.150	0.231	pCi/g					
Bismuth–211	X	11.4	0.0687	+/–0.251	0.140	pCi/g					
Bismuth–212	U	0.111	0.084	+/–0.193	0.173	pCi/g					
Bismuth–214		3.49	0.0205	+/–0.0922	0.0421	pCi/g					
Cadmium–109	X	3.54	0.221	+/–0.418	0.448	pCi/g					
Cerium–139	U	–0.00665	0.0104	+/–0.0118	0.0211	pCi/g					
Cerium–141	U	0.0302	0.0256	+/–0.0243	0.0519	pCi/g					
Cerium–144	U	–0.0292	0.0674	+/–0.0752	0.137	pCi/g					
Cesium–134	U	0.0284	0.0138	+/–0.018	0.0284	pCi/g					
Cesium–137	U	–0.000241	0.0106	+/–0.0143	0.0219	pCi/g					
Chromium–51	U	–0.0797	0.159	+/–0.190	0.324	pCi/g					
Cobalt–57	U	0.000937	0.00827	+/–0.0091	0.0168	pCi/g					
Cobalt–60	U	0.013	0.0127	+/–0.0145	0.0265	pCi/g					
Europium–152	U	–0.00671	0.0322	+/–0.0385	0.0656	pCi/g					
Europium–154	U	0.0277	0.0368	+/–0.0424	0.0764	pCi/g					
Iron–59	U	–0.0151	0.032	+/–0.044	0.0663	pCi/g					
Lead–211	U	0.200	0.324	+/–0.360	0.660	pCi/g					
Lead–212		0.520	0.0201	+/–0.0359	0.0407	pCi/g					
Lead–214		3.97	0.0224	+/–0.0873	0.0457	pCi/g					
Manganese–54	U	–0.0141	0.0115	+/–0.0145	0.0238	pCi/g					
Mercury–203	U	0.011	0.0162	+/–0.022	0.0329	pCi/g					
Neptunium–237	X	1.02	0.0649	+/–0.121	0.132	pCi/g					
Neptunium–239	U	–0.0641	0.0584	+/–0.0652	0.118	pCi/g					
Niobium–95	U	0.0758	0.0215	+/–0.0257	0.0758	pCi/g					
Potassium–40		11.4	0.115	+/–0.546	0.240	pCi/g					
Protactinium–231	U	–0.394	0.502	+/–0.598	1.02	pCi/g					
Protactinium–233	U	–0.00818	0.0203	+/–0.0242	0.0414	pCi/g					
Protactinium–234	U	–0.00292	0.0916	+/–0.106	0.190	pCi/g					
Radium–223	U	0.192	0.216	+/–0.251	0.439	pCi/g					
Radium–224	X	8.17	0.212	+/–0.424	0.431	pCi/g					
Radium–226		3.49	0.0205	+/–0.0922	0.0421	pCi/g					
Radium–228		0.533	0.0425	+/–0.0983	0.0876	pCi/g					
Radon–219	U	–0.0801	0.139	+/–0.158	0.283	pCi/g					
Rhodium–106		–0.0308	0.0941	+/–0.111	0.194	pCi/g					

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Report Date: November 23, 2005

Client Sample ID: 070382-010
Sample ID: 148808018

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
	U									
Ruthenium-103	U	0.0235	0.0154	+/-0.0169	0.0316	pCi/g				
Ruthenium-106	U	0.0042	0.0944	+/-0.110	0.195	pCi/g				
Selenium-75	U	0.0179	0.0158	+/-0.0181	0.0322	pCi/g				
Sodium-22	U	0.00691	0.0133	+/-0.0154	0.0275	pCi/g				
Strontium-85	U	0.0472	0.0137	+/-0.0161	0.0472	pCi/g				
Thallium-208		0.158	0.0125	+/-0.0253	0.0255	pCi/g				
Thorium-227	U	-0.0761	0.123	+/-0.163	0.251	pCi/g				
Thorium-231	U	0.311	0.0654	+/-0.120	0.311	pCi/g				
Thorium-232		0.506	0.0195	+/-0.035	0.0396	pCi/g				
Thorium-234		1.09	0.392	+/-0.739	0.794	pCi/g				
Tin-113	U	-0.0109	0.0153	+/-0.0198	0.0312	pCi/g				
Uranium-235		0.156	0.072	+/-0.119	0.146	pCi/g				
Uranium-238		1.09	0.392	+/-0.739	0.794	pCi/g				
Yttrium-88	U	-0.0153	0.00982	+/-0.0129	0.0212	pCi/g				
Zinc-65	U	0.00563	0.0261	+/-0.0349	0.0542	pCi/g				
Zirconium-95	U	0.000244	0.024	+/-0.0285	0.0494	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	NXL1	10/28/05	0922	475995

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3
2	EML HASL 300, 4.5.2.3

Notes:
TPU is calculated at the 95% confidence level (2-sigma).
The Qualifiers in this report are defined as follows :

* Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
** Indicates analyte is a surrogate compound.
B The analyte was found in the blank above the effective MDL.
H Analytical holding time was exceeded
J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the

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Project: Level C Data Package

Report Date: November 23, 2005

Client Sample ID: 070382–010
Sample ID: 148808018

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M

effective MDL. For radiochemical analytes the result is less than the Decision Level
X Data rejected due to interference.
X Data rejected due to low abundance.
X Data rejected due to no valid peak.
X Uncertain identification for gamma spectroscopy.
d The 2:1 depletion requirement was not met for this sample
h Prep holding time exceeded
The above sample is reported on a dry weight basis.

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: October 11, 2005

Client Sample ID: 070264-010
Sample ID: 145490018
Matrix: soil
Collect Date: 13-SEP-05
Receive Date: 15-SEP-05
Collector: Client

Project: SNLS00401
Client ID: SNLS002
Client Desc.: 58UP1-GR-002-0-SS

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch N
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Actinium-228		1.16	0.0253	+/-0.0789	0.0521	pCi/g		MJH1 10/05/05	2251	467119 I
Americium-241	U	0.00868	0.0477	+/-0.0534	0.0967	pCi/g				
Antimony-124	U	0.0145	0.0162	+/-0.0182	0.034	pCi/g				
Antimony-125	U	-0.0113	0.0191	+/-0.0217	0.0391	pCi/g				
Barium-133	U	-0.00496	0.00883	+/-0.0112	0.018	pCi/g				
Beryllium-7	U	0.0387	0.0729	+/-0.110	0.149	pCi/g				
Bismuth-211	X	2.64	0.0441	+/-0.123	0.0899	pCi/g				
Bismuth-212		0.651	0.0562	+/-0.148	0.116	pCi/g				
Bismuth-214		0.779	0.0139	+/-0.0442	0.0284	pCi/g				
Cadmium-109	X	2.16	0.183	+/-0.326	0.370	pCi/g				
Cerium-139	U	0.00397	0.00725	+/-0.0088	0.0147	pCi/g				
Cerium-141	U	0.0174	0.0182	+/-0.0194	0.0368	pCi/g				
Cerium-144	U	0.0144	0.0499	+/-0.0536	0.101	pCi/g				
Cesium-134	X	0.0462	0.0103	+/-0.020	0.021	pCi/g				
Cesium-137	U	0.00846	0.00763	+/-0.0125	0.0156	pCi/g				
Chromium-51	U	0.00188	0.097	+/-0.113	0.198	pCi/g				
Cobalt-57	U	0.00161	0.00633	+/-0.00675	0.0128	pCi/g				
Cobalt-60	U	0.00871	0.00803	+/-0.00925	0.0166	pCi/g				
Europium-152	U	-0.00967	0.0206	+/-0.0228	0.042	pCi/g				
Europium-154	U	-0.015	0.0232	+/-0.0284	0.048	pCi/g				
Iron-59	U	0.00536	0.0201	+/-0.027	0.0414	pCi/g				
Lead-211	U	-0.194	0.191	+/-0.217	0.390	pCi/g				
Lead-212		1.11	0.0127	+/-0.0327	0.0259	pCi/g				
Lead-214		0.919	0.0147	+/-0.0429	0.030	pCi/g				
Manganese-54	X	0.0185	0.00717	+/-0.0138	0.0147	pCi/g				
Mercury-203	X	0.0265	0.0101	+/-0.017	0.0206	pCi/g				
Neptunium-237	X	0.628	0.0543	+/-0.0948	0.110	pCi/g				
Neptunium-239	U	0.0769	0.0467	+/-0.0692	0.0948	pCi/g				
Niobium-95	U	0.0208	0.0116	+/-0.0206	0.0238	pCi/g				
Potassium-40		23.1	0.062	+/-0.482	0.130	pCi/g				
Protactinium-231	U	0.181	0.340	+/-0.389	0.693	pCi/g				
Protactinium-233	U	-0.0134	0.0135	+/-0.0161	0.0275	pCi/g				
Protactinium-234	U	-0.0853	0.0586	+/-0.0707	0.121	pCi/g				
Radium-223	U	-0.0419	0.141	+/-0.166	0.287	pCi/g				
Radium-224	X	3.10	0.145	+/-0.379	0.294	pCi/g				
Radium-226		0.779	0.0139	+/-0.0442	0.0284	pCi/g				
Radium-228		1.16	0.0253	+/-0.0789	0.0521	pCi/g				
Radon-219	U	0.045	0.0868	+/-0.0955	0.177	pCi/g				

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1515 Eubank SE
Albuquerque, New Mexico 87123
Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: October 11, 2005

Client Sample ID: 070264-010
Sample ID: 145490018

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch N
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Rhodium-106	U	0.0479	0.0655	+/-0.0748	0.134	pCi/g				
Ruthenium-103	U	-0.00343	0.00937	+/-0.0108	0.0192	pCi/g				
Ruthenium-106	U	0.0573	0.0656	+/-0.0746	0.135	pCi/g				
Selenium-75	U	-0.00688	0.00982	+/-0.0114	0.020	pCi/g				
Sodium-22	U	-0.00535	0.00835	+/-0.0102	0.0173	pCi/g				
Strontium-85	X	0.0468	0.00952	+/-0.0108	0.0194	pCi/g				
Thallium-208		0.340	0.00728	+/-0.0222	0.0149	pCi/g				
Thorium-227	U	-0.0626	0.0842	+/-0.110	0.171	pCi/g				
Thorium-231	X	0.320	0.0487	+/-0.0753	0.0988	pCi/g				
Thorium-232		1.09	0.0124	+/-0.032	0.0253	pCi/g				
Thorium-234		0.788	0.356	+/-0.632	0.722	pCi/g				
Tin-113	U	-0.00712	0.00952	+/-0.0107	0.0195	pCi/g				
Uranium-235	U	0.0625	0.0519	+/-0.0553	0.105	pCi/g				
Uranium-238		0.788	0.356	+/-0.632	0.722	pCi/g				
Yttrium-88	U	-0.00205	0.00633	+/-0.00772	0.0134	pCi/g				
Zinc-65	U	-0.00928	0.0182	+/-0.0252	0.0374	pCi/g				
Zirconium-95	U	0.0176	0.0157	+/-0.0226	0.0323	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	TC1	09/16/05	1638	463272

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
TPU is calculated at the 95% confidence level (2-sigma).
The Qualifiers in this report are defined as follows :

* Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
** Indicates analyte is a surrogate compound.
B The analyte was found in the blank above the effective MDL.
H Analytical holding time was exceeded
J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

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Project: Level C Data Package

Report Date: October 11, 2005

Client Sample ID: 070264-010
Sample ID: 145490018

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M

X Data rejected due to interference.
X Data rejected due to low abundance.
X Data rejected due to no valid peak.
X Uncertain identification for gamma spectroscopy.
d The 2:1 depletion requirement was not met for this sample
h Prep holding time exceeded
The above sample is reported on a dry weight basis.

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Albuquerque, New Mexico 87123
Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: October 11, 2005

Client Sample ID: 070265-010
Sample ID: 145490019
Matrix: soil
Collect Date: 13-SEP-05
Receive Date: 15-SEP-05
Collector: Client

Project: SNLS00401
Client ID: SNLS002
Client Desc.: 58UP1-GR-003-0-SS

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Actinium-228		1.24	0.0267	+/-0.090	0.055	pCi/g		MJH1 10/06/05	2125	467119 1
Americium-241	U	0.0148	0.050	+/-0.057	0.101	pCi/g				
Antimony-124	U	-0.0208	0.0152	+/-0.0195	0.0323	pCi/g				
Antimony-125	U	0.000384	0.0206	+/-0.0233	0.0422	pCi/g				
Barium-133	U	-0.00557	0.00935	+/-0.012	0.0191	pCi/g				
Beryllium-7	U	0.00441	0.0777	+/-0.0888	0.159	pCi/g				
Bismuth-211	X	2.77	0.0466	+/-0.138	0.0951	pCi/g				
Bismuth-212		0.768	0.0601	+/-0.154	0.124	pCi/g				
Bismuth-214		0.820	0.0155	+/-0.0468	0.0318	pCi/g				
Cadmium-109	X	2.78	0.188	+/-0.375	0.382	pCi/g				
Cerium-139	U	-0.00899	0.00747	+/-0.0085	0.0152	pCi/g				
Cerium-141	U	0.0306	0.0183	+/-0.0302	0.0372	pCi/g				
Cerium-144	U	-0.00414	0.0523	+/-0.0575	0.106	pCi/g				
Cesium-134	X	0.0421	0.011	+/-0.0215	0.0224	pCi/g				
Cesium-137		0.203	0.0081	+/-0.0189	0.0166	pCi/g				
Chromium-51	U	-0.0402	0.103	+/-0.123	0.211	pCi/g				
Cobalt-57	U	-0.00217	0.00661	+/-0.00807	0.0134	pCi/g				
Cobalt-60	U	0.000938	0.00852	+/-0.0103	0.0177	pCi/g				
Europium-152	U	-0.00129	0.0224	+/-0.0248	0.0456	pCi/g				
Europium-154	U	0.00207	0.0256	+/-0.0308	0.053	pCi/g				
Iron-59	U	-0.0302	0.0205	+/-0.0254	0.0423	pCi/g				
Lead-211	U	-0.0484	0.212	+/-0.239	0.432	pCi/g				
Lead-212		1.09	0.0136	+/-0.0344	0.0276	pCi/g				
Lead-214		0.964	0.0157	+/-0.0478	0.0319	pCi/g				
Manganese-54	X	0.0277	0.00763	+/-0.0208	0.0157	pCi/g				
Mercury-203	X	0.0304	0.0107	+/-0.0188	0.0217	pCi/g				
Neptunium-237	X	0.808	0.0559	+/-0.109	0.113	pCi/g				
Neptunium-239	U	-0.00884	0.0483	+/-0.0586	0.0981	pCi/g				
Niobium-95	X	0.043	0.013	+/-0.0136	0.0267	pCi/g				
Potassium-40		22.5	0.0618	+/-0.467	0.130	pCi/g				
Protactinium-231	U	-0.0109	0.359	+/-0.420	0.731	pCi/g				
Protactinium-233	U	-6.110E-05	0.0146	+/-0.0172	0.0297	pCi/g				
Protactinium-234	U	0.0158	0.0667	+/-0.077	0.137	pCi/g				
Radium-223	U	0.0328	0.151	+/-0.178	0.307	pCi/g				
Radium-224	X	3.00	0.154	+/-0.339	0.314	pCi/g				
Radium-226		0.820	0.0155	+/-0.0468	0.0318	pCi/g				
Radium-228		1.24	0.0267	+/-0.090	0.055	pCi/g				
Radon-219	U	0.0348	0.0934	+/-0.104	0.191	pCi/g				

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: October 11, 2005

Client Sample ID: 070265-010
Sample ID: 145490019

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Rhodium-106	U	0.0369	0.0719	+/-0.0833	0.147	pCi/g				
Ruthenium-103	U	-0.00263	0.00998	+/-0.0115	0.0205	pCi/g				
Ruthenium-106	U	-0.00466	0.0712	+/-0.0839	0.146	pCi/g				
Selenium-75	U	0.00268	0.0107	+/-0.0124	0.0217	pCi/g				
Sodium-22	U	0.000743	0.00922	+/-0.0111	0.019	pCi/g				
Strontium-85	X	0.0555	0.0104	+/-0.0107	0.0212	pCi/g				
Thallium-208		0.363	0.00784	+/-0.0268	0.0161	pCi/g				
Thorium-227	U	-0.0493	0.0884	+/-0.117	0.180	pCi/g				
Thorium-231	X	0.382	0.0519	+/-0.0852	0.105	pCi/g				
Thorium-232		1.06	0.0133	+/-0.0336	0.027	pCi/g				
Thorium-234		0.990	0.396	+/-0.694	0.802	pCi/g				
Tin-113	U	0.00136	0.0105	+/-0.0133	0.0213	pCi/g				
Uranium-235	U	0.103	0.0556	+/-0.100	0.113	pCi/g				
Uranium-238		0.990	0.396	+/-0.694	0.802	pCi/g				
Yttrium-88	U	-0.000695	0.00699	+/-0.00843	0.0148	pCi/g				
Zinc-65	U	-0.00728	0.0192	+/-0.0266	0.0394	pCi/g				
Zirconium-95	U	0.009	0.0169	+/-0.029	0.0346	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	TC1	09/16/05	1638	463272

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
TPU is calculated at the 95% confidence level (2-sigma).
The Qualifiers in this report are defined as follows :

* Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
** Indicates analyte is a surrogate compound.
B The analyte was found in the blank above the effective MDL.
H Analytical holding time was exceeded
J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

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Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: October 11, 2005

Client Sample ID: 070265-010
Sample ID: 145490019

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch

X Data rejected due to interference.
X Data rejected due to low abundance.
X Data rejected due to no valid peak.
X Uncertain identification for gamma spectroscopy.
d The 2:1 depletion requirement was not met for this sample
h Prep holding time exceeded
The above sample is reported on a dry weight basis.

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Albuquerque, New Mexico 87123
Contact: Ms. Pamela M. Puissant
Project: Level C Data Package

Report Date: October 11, 2005

Client Sample ID: 070266-010
Sample ID: 145490020
Matrix: soil
Collect Date: 13-SEP-05
Receive Date: 15-SEP-05
Collector: Client

Project: SNLS00401
Client ID: SNLS002

Client Desc.: 58UP1-GR-004-0-SS

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
Actinium-228		0.952	0.0393	+/-0.117	0.0816	pCi/g		MJH1 10/07/05	2132	467119 1
Americium-241	U	0.0187	0.0509	+/-0.0586	0.103	pCi/g				
Antimony-124	U	0.00796	0.0246	+/-0.0289	0.0531	pCi/g				
Antimony-125	U	0.0357	0.0297	+/-0.0476	0.061	pCi/g				
Barium-133	U	0.00164	0.013	+/-0.0172	0.0267	pCi/g				
Beryllium-7	U	0.100	0.117	+/-0.129	0.240	pCi/g				
Bismuth-211	X	2.40	0.0593	+/-0.194	0.121	pCi/g				
Bismuth-212		0.477	0.086	+/-0.194	0.178	pCi/g				
Bismuth-214		0.719	0.0195	+/-0.0638	0.0404	pCi/g				
Cadmium-109	X	2.12	0.216	+/-0.392	0.438	pCi/g				
Cerium-139	U	-0.00538	0.00912	+/-0.0103	0.0186	pCi/g				
Cerium-141	U	0.0339	0.0223	+/-0.0302	0.0454	pCi/g				
Cerium-144	U	0.00227	0.062	+/-0.0681	0.126	pCi/g				
Cesium-134	X	0.0534	0.0149	+/-0.0257	0.0307	pCi/g				
Cesium-137		0.365	0.0115	+/-0.0314	0.0237	pCi/g				
Chromium-51	U	-0.0798	0.145	+/-0.172	0.296	pCi/g				
Cobalt-57	U	-0.00209	0.00762	+/-0.00837	0.0155	pCi/g				
Cobalt-60	U	0.0122	0.0133	+/-0.0149	0.0278	pCi/g				
Europium-152	U	-0.0204	0.0296	+/-0.0355	0.0606	pCi/g				
Europium-154	U	-0.0225	0.035	+/-0.0421	0.0732	pCi/g				
Iron-59	U	-0.017	0.0303	+/-0.0412	0.0632	pCi/g				
Lead-211	U	0.167	0.293	+/-0.344	0.601	pCi/g				
Lead-212		0.971	0.0168	+/-0.0409	0.0342	pCi/g				
Lead-214		0.835	0.0207	+/-0.0674	0.0423	pCi/g				
Manganese-54	U	0.0225	0.0109	+/-0.0168	0.0225	pCi/g				
Mercury-203	U	0.024	0.0141	+/-0.029	0.0288	pCi/g				
Neptunium-237	X	0.615	0.0637	+/-0.114	0.129	pCi/g				
Neptunium-239	U	0.0619	0.0551	+/-0.0761	0.112	pCi/g				
Niobium-95	U	0.0232	0.018	+/-0.0227	0.0371	pCi/g				
Potassium-40		20.0	0.0896	+/-0.660	0.191	pCi/g				
Protactinium-231	U	0.0405	0.476	+/-0.550	0.971	pCi/g				
Protactinium-233	U	0.00181	0.0195	+/-0.0227	0.0399	pCi/g				
Protactinium-234	U	0.0592	0.0947	+/-0.111	0.197	pCi/g				
Radium-223	U	0.0323	0.206	+/-0.240	0.420	pCi/g				
Radium-224	X	2.78	0.191	+/-0.484	0.390	pCi/g				
Radium-226		0.719	0.0195	+/-0.0638	0.0404	pCi/g				
Radium-228		0.952	0.0393	+/-0.117	0.0816	pCi/g				
Radon-219	U	0.0229	0.128	+/-0.152	0.262	pCi/g				
Rhodium-106		-0.0279	0.0921	+/-0.107	0.191	pCi/g				

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Project: Level C Data Package

Report Date: October 11, 2005

Client Sample ID: 070266-010
Sample ID: 145490020

Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch N
Rad Gamma Spec Analysis										
Gammaspec, Gamma, Solid (Long List)										
	U									
Ruthenium-103	U	0.0187	0.0152	+/-0.0166	0.0313	pCi/g				
Ruthenium-106	U	-0.0598	0.0906	+/-0.107	0.188	pCi/g				
Selenium-75	U	-0.002	0.0141	+/-0.0163	0.0288	pCi/g				
Sodium-22	U	-0.0125	0.0126	+/-0.0154	0.0264	pCi/g				
Strontium-85	X	0.0419	0.0138	+/-0.016	0.0282	pCi/g				
Thallium-208		0.296	0.0113	+/-0.0281	0.0232	pCi/g				
Thorium-227	U	0.0247	0.119	+/-0.136	0.243	pCi/g				
Thorium-231	X	0.443	0.0631	+/-0.104	0.129	pCi/g				
Thorium-232		0.948	0.0164	+/-0.0399	0.0334	pCi/g				
Thorium-234	U	0.654	0.397	+/-0.895	0.807	pCi/g				
Tin-113	U	-0.00601	0.0148	+/-0.0178	0.0303	pCi/g				
Uranium-235	U	0.121	0.0635	+/-0.104	0.129	pCi/g				
Uranium-238	U	0.654	0.397	+/-0.895	0.807	pCi/g				
Yttrium-88	U	0.00165	0.0108	+/-0.013	0.0234	pCi/g				
Zinc-65	U	-0.00175	0.0262	+/-0.0348	0.0545	pCi/g				
Zirconium-95	U	0.0235	0.0241	+/-0.0324	0.0499	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	TC1	09/16/05	1638	463272

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
TPU is calculated at the 95% confidence level (2-sigma).
The Qualifiers in this report are defined as follows :

* Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
** Indicates analyte is a surrogate compound.
B The analyte was found in the blank above the effective MDL.
H Analytical holding time was exceeded
J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

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Project: SNLS00401
Client ID: SNLS002

Parameter	Qualifier	Result	LC	TPU	MDA	Units	DF	AnalystDate	Time	Batch M

X Data rejected due to interference.
X Data rejected due to low abundance.
X Data rejected due to no valid peak.
X Uncertain identification for gamma spectroscopy.
d The 2:1 depletion requirement was not met for this sample
h Prep holding time exceeded
The above sample is reported on a dry weight basis.

ANNEX B
SWMUs 8 and 58
Soil Sample Data Validation Reports, September and October 2005

September 2005 Sample Data Validation Reports
AR/COCs 608867–608870

RECORDS CENTER CODE: ER/1332/58/DAT

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: Foothills Site 58 PROJECT/TASK: 7213_02.02.06

SNL TASK LEADER: Langkopf ORG/MS/CF0#: 6146/1087/CF055-06

SMO PROJECT LEAD: ~~Herrera~~ Palencia SAMPLE SHIP DATE: 9/14/2005

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
608867	GEL	145490		10/14/2005	X	X	X	X
608868	GEL	145490		10/14/2005	X	X	X	X
608869	GEL	145490		10/14/2005	X	X	X	X
608870	GEL	145490		10/14/2005	X	X	X	X

DATA PACKAGE TAT:		RUSH	X	NORMAL
CORRECTIONS REQUESTED BY/DATE:				
PROBLEM #/DATE CORRECTION RECEIVED:				
CVR COMPLETED BY/DATE:	W. Palencia		10-17-05	
FINAL TRANSMITTED TO/DATE:	Langkopf		10-17-05	
SENT TO VALIDATION BY/DATE:	K. Kavanaugh		10-18-05	
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):				
P/a 11/1/05 VALIDATION COMPLETED BY/DATE:	KAK		10-27-05	
COPY TO WM BY/DATE:				
CD REQUESTED BY/DATE				
CD RECEIVED BY/DATE	R. Kavanaugh		10/14/2005	
TO ERDMS OR RECORDS CENTER BY/DATE:	K Kavanaugh		11-1-05	

COMMENTS:

Sample Findings Summary

Site: Foothills Site 58 **AR/COC:** 608867, 608868, 608869, 608870 **Data Type:** Organic, Inorganic, & Rad

	ICP metals			Radiochemistry														
		7440-39-3 (Barium)	7440-66-6 (Zinc)		15229-37-5 (Bismuth-211)	14109-32-1 (Cadmium-109)	13967-70-9 (Cesium-134)	13966-31-9 (Manganese-54)	13982-78-0 (Mercury-203)	13994-20-2 (Neptunium-237)	13967-76-5 (Niobium-95)	13233-32-4 (Radium-224)	13967-73-2 (Strontium-85)	14932-40-2 (Thorium-231)	13966-00-2 (Potassium-40)		
070243-003 58O-GR-100-0-EB			J,B															
070240-002 58O-GR-100-5-S		J,P1																
070391-002 58O-GR-100-10-S		J,P1																
070264-010 58UP1-GR-002-0-SS					R	R	R	R	R	R		R	R	R	J,P1			
070265-010 58UP1-GR-003-0-SS					R	R	R	R	R	R	R	R	R	R	J,P1			
070266-010 58UP1-GR-004-0-SS					R	R	R			R		R	R	R	J,P1			
			HE analysis met QC acceptance criteria. No data will be qualified.															

Validated By: Kevin A Lambert **Date:** 10/27/05

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

Date: October 27, 2005

To: File

From: Kevin Lambert

Subject: Radiochemical Data Review and Validation – SNL
Site: Foothills Site 58
AR/COC: 608867, 608868, 608869, and 608870
SDG: 145490, 145493, and 145494
Laboratory: GEL
Project/Task: 7213.02.02.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using HASL300,4.5.2.3 (Gamma Spec). Problems were identified with the data package that result in the qualification of data.

1. Gamma Spec:
   Several gamma spec results were "X" flagged by the laboratory due to low abundance, interference, or no valid peak (refer to Electronic Data Deliverable). The associated sample results that were not qualified "U" (non-detects) by the laboratory and will be qualified "R" (unusable). See Sample Findings Summary.

   The replicate error ratio (RER) for K-40 (1.12%) was > 1 but < 3. The associated sample results were detects and will be qualified "J, P1."

Data are acceptable except as noted above and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

The case narrative stated the instruments used were properly calibrated.

Negative Bias

All sample results met negative bias QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as follows.

Gamma Spec:
It should be noted that the laboratory rejected the result for Cs-137, K-40, and Sr-85 due to low abundance, interference, or no valid peak. No data will be qualified as a result.

Tracer/Carrier Recovery

Not Applicable

Laboratory Control Sample (LCS)

The LCS met QC acceptance criteria.

Matrix Spike (MS)

The MS met QC acceptance criteria.

Replicate

The replicate met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required.

Other QC

No equipment blank (EB), field blank (FB) or field duplicate pair was submitted on the AR/COC(s).

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

Date: October 27, 2005

To: File

From: Kevin Lambert

Subject: Organic Data Review and Validation – SNL
Site: Foothills Site 58
AR/COC: 608867, 608868, 608869, and 608870
SDG: 145490, 145493, and 145494
Laboratory: GEL
Project/Task: 7213.02.02.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

All samples were prepared and analyzed with accepted procedures using method EPA8330 (High Explosives). All compounds were successfully analyzed. No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

All samples were extracted and analyzed within the prescribed holding times and properly preserved.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Internal Standards (ISs)

Not Applicable

Surrogates

The surrogate recoveries met QC acceptance criteria.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

The LCS/LCSD met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met QC acceptance criteria except as follows.

High Explosives (HE):
The MS/MSD was run on an unknown SDG for the field QC sample. Laboratory precision was assessed using the LCS/LCSD. No data will be qualified as a result.

Target Compound Identification/Confirmation

Confirmation analysis met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required except as follows.

HE:
The samples were diluted 2x according to the laboratory procedure for this analysis.

Other QC

No trip blank (TB), equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

HE:
An EB and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues were identified which affect data quality.

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Phone: 505-299-5201
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Email: minteer@aol.com

Memorandum

Date: October 27, 2005

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: Foothills Site 58
AR/COC: 608867, 608868, 608869, and 608870
SDG: 145490, 145493, and 145494
Laboratory: GEL
Project/Task: 7213.02.02.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6020 (ICP-MS metals). Problems were identified with the data package that result in the qualification of data.

1. ICP-MS metals:
   For the field QC samples, the following target analytes was detected (≥ DL) in one or more of the blanks (ICB, CCB, MB). The associated sample results are qualified as noted below.

   Sample 145494-001 Zn was a detect < 5x the MB and will be qualified "J, B."

   For field samples, the replicate RPD for barium (29%) was outside QC acceptance criteria (20%). The associated sample results were detects and will be qualified "J, P1."

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

The initial and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

ICP-MS metals:
Barium and lead were detected (≥ DL) in one or more of the blanks (ICB, CCB, MB). The associated sample results were detects > 5x the blank concentrations; no data will be qualified as a result. Also, lead was detected (≥ DL) in one or more of the blanks (ICB, CCB) at negative concentration with absolute value > the DL but < the RL. The associated sample results were detects > 5x the DL; no data will be qualified as a result.

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD met QC acceptance criteria except as follows.

ICP-MS metals:
For the field samples, it should be noted that no LCSD was provided with the SDG. No data will be qualified as a result. Laboratory precision was assessed using the replicate.

Matrix Spike (MS)

The MS met QC acceptance criteria as follows.

ICP-MS metals:
For the field QC samples, the MS was run on an unknown SDG. Laboratory precision was assessed using the LCS/LCSD. No data will be qualified as a result. For the field samples, it should be noted that the MS %R limits do not apply for target analytes with sample concentrations > 4x the spike concentrations (see Data Validation Worksheets). No data will be qualified as a result. Also, for the field samples it should be noted that an MSD was assessed for total uranium U-235, and U-238. No data will be qualified as a result.

Replicate

The replicate met QC acceptance criteria except as noted above in the summary section and as follows.

ICP-MS metals:
For the field QC samples, the replicate was run on an unknown SDG. Laboratory precision was assessed using the LCS/LCSD. No data will be qualified as a result. For the field samples, it should be noted that an MSD was used to assess laboratory precision for total uranium U-235, and U-238. No data will be qualified as a result.

ICP Serial Dilution

The serial dilution met QC acceptance criteria.

ICP Interference Check Sample (ICS)

The ICS data met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required except as follows.

ICP-MS metals:
The field samples were diluted 2x according to the laboratory procedure for this analysis.

Other QC

No equipment blank (EB), trip blank (TB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

ICP-MS metals:
EBs and field duplicate pairs were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: Foothills Site 58 Project/Task #: 7213.02.02.06 # of Samples: 38 Matrix: 34 soil, 4 aqueous

AR/COC #: 608867, 608868, 608869, 608870 Laboratory Sample IDs: 145490-001 to -020

Laboratory: GEL 145493-001 to -014

SDG #: 145490, 145493, 145494 145494-001 to -004

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/~~AES~~ MS	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation				✓	✓				✓	
2. Calibrations				✓	✓				NA	
3. Method Blanks				✓	J				✓	
4. MS/MSD				✓	✓				NA	
5. Laboratory Control Samples				✓	✓				✓	
6. Replicates					J				J	
7. Surrogates				✓						
8. Internal Standards										
9. TCL Compound Identification										
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC EB, Dup's, lab rejected				✓	J				R	

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable
Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: Karin A Lambert Date: 10-27-05

Radiochemistry

Field Samples

Site/Project: _____ AR/COC #: 608867, 608868, 608869, 608870 Laboratory Sample IDs: 145490-018, -019, -020

Laboratory: _____ SDG #: 145490, 145493, 145494

Methods: HASL 300, 4.5.2.3 (G. Spec)

# of Samples: 2 Matrix: Soil Batch #s: 467119

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER (1)	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3													
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓									
Gamma Spec. Cs-137	NA	✓	↓	✓									
Gamma Spec. Co-60	✓	✓	↓	✓									
↓ K-40	NA	NA	↓	1.12									

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments: G. Spec: several results were rejected by the lab: assoc results that were not also qualified ND by the lab will be qualified "R"

(1) The replicate RER for K-40 was > 1 but < 3; assoc results were detects and will be qualified "J, P1"

Reviewed By: Kevin A Lambert Date: 10-27-05

608867, 608868

Inorganic Metals

EBs

Site/Project: _____ AR/COC #: 608869, 608870 Laboratory Sample IDs: 145494-001, -003, -004

Laboratory: _____ SDG #: 145490, 145493, 145494

Methods: EPA6020 (ICP-MS)

# of Samples: 3 Matrix: aqueous Batch #s: 463402

CAS # / Analyte	QC Element																(1) 5x Field Blanks		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks			
7429-90-5 Al																				
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	✓	✓					
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni																				
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn	✓	✓	✓	✓	✓	0.00256J	✓	✓	✓	NA	NA	NA	NA	✓	✓				0.0128	
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	✓	✓					
7782-49-2 Se																				
7440-38-2 As																				
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: QC run on unknown SDG. Lab precision assessed using LCS/LCSD

(1) Zn was detected in the blk; result was a detect < 5x blk [c] and will be qualified "J, B"

Reviewed By: Kevin A Lambert Date: 10-27-05

Field Samples

608867, 608868

Inorganic Metals

Site/Project: _____ AR/COC #: 608869, 608870 Laboratory Sample IDs: 145490-001,-002*,-003*,-004*,-009,-010,-011
↓ -012,-013**,-014**,-015**,-016**,-017**

Laboratory: _____ SDG #: 145490, 145493, 145494

Methods: EPA 6020 (ICP-MS)

# of Samples: 13 Matrix: soil Batch #s: 463396

CAS # / Analyte	QC Element (1)												(2)					(1) 608870		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Eq Field Blanks	5x Blk [5x DL]	
7429-90-5 Al																				
~~7440-39-3 Ba~~	✓	✓	✓	✓	✓	✓	✓	NA	NA	N/A	NA	NA	29 (20)	✓	✓	✓	0.00015J*		0.0065	
7440-41-7 Be																				
~~7440-43-9 Cd~~																				
7440-70-2 Ca																				
~~7440-47-3 Cr~~																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni																				
7440-09-7 K																				
~~7440-22-4 Ag~~																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn	✓	✓	✓	✓	✓	✓	✓	NA	NA	N/A	NA	NA	✓	✓	✓	11	0.00833J*		0.04163	
~~7439-92-1 Pb~~	✓	✓	✓	-0.000559	0.000596	✓	✓	NA	NA	✓	NA	NA	✓	✓	✓	30/18	✓	0.000916J**	J 0.00458 [5x 0.00229]	
7782-49-2 Se																				
~~7440-38-2 As~~																				
7440-36-0 Sb																				
7440-28-0 Tl																				
~~7439-97-6 Hg~~																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. ~~Solids-to-aqueous conversion~~: mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: N/A - The MS %R limits don't apply; sample [c] > 4x spike [c]

(1) Ba, Zn, & Pb were detected in the blks; NDs or detects > 5x blk [c] will not be qualified

(1) Pb was detected @ neg [c] w/ abs value > DL but < RL; detects > 5x DL will not be qualified

(2) ~~The MS %R for Ba~~ KAL The Rep RPD for Ba was outside QC acceptance criteria; results were detects and will be qualified "J, P1"

Reviewed By: Kevin A Lambert Date: 10-27-05

608867, 608868 **Inorganic Metals** Field Samples

Site/Project: _____ AR/COC #: 608869, 608870 Laboratory Sample IDs: 145493-001,-002,-003,-004,-005,-006,-007

Laboratory: _____ SDG #: 145490, 145493, 145494 ↓ -008,-009,-010,-011,-012,-013,-014

Methods: EPA 6020 (ICP-MS)

# of Samples: 14 Matrix: Soil Batch #s: 463400

CAS # / Analyte	QC Element																		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni																			
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb																			
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg																			
Cyanide CN																			
Total U	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	NA	✓	✓	33	NA	NA	
U-235	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	32	↓	↓	
U-238	✓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	33	↓	↓	

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments:

Reviewed By: Kevin A Lambert Date: 10-27-05

High Explosives (SW 846 Method 8330)

EB

Site/Project: _____ AR/COC #: 608867, 608868, 608869, 608870 Laboratory Sample IDs: 145494-002

Laboratory: _____ SDG #: 145490, 145493, 145494

Methods: EPA8330 (HE)

# of Samples: 1 Matrix: aqueous Batch #s: 463225

CAS #	NAME		Intercept	Curve R^2 .99	CCV %D 20%	Method Blanks U	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks U	Field Blanks U		
2691-41-0	HMX	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA					
121-82-4	RDX	✓															
99-35-4	1,3,5-Trinitrobenzene	✓															
99-65-0	1,3-dinitrobenzene	✓															
98-95-3	Nitrobenzene	✓															
479-45-8	Tetryl	✓															
118-96-7	2,4,6-trinitrotoluene	✓															
35572-78-2	2-amino-4,6-dinitrotoluene	✓															
19406-51-0	4-amino-2,6-dinitrotoluene	✓															
121-14-2	2,4-dinitrotoluene	✓															
606-20-2	2,6-dinitrotoluene	✓															
88-72-2	2-nitrotoluene	✓															
99-99-0	4-nitrotoluene	✓															
99-08-1	3-nitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
~~78-11-5~~	~~PETN~~																

Sample	SMC %REC	SMC RT	Sample	SMC %REC	SMC RT
Met Criteria					

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
Not Required		Results NDs			

Comments: QC run on unknown SDG; No ~~measure of precision provided; results will be flagged "P2" to indicate insufficient QC data to determine lab precision~~ KAL
However an LCS/LCSD was run which provided a measure of precision; No data will be qualified

Solids-to-aqueous conversion:
mg / kg = µg / g:[(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l Reviewed By: Kevin A Lambert Date: 10-27-05

High Explosives (SW 846 Method 8330) KAL

Field Samples

Site/Project: _____ AR/COC #: 608867, 608868, 608869, 608870 Laboratory Sample IDs: 145494 145490-005, -006, -007, -008

Laboratory: _____ SDG #: 145490, 145493, 145494

Methods: EPA 8330 (HE)

# of Samples: 4 Matrix: soil Batch #s: 463231

CAS #	NAME	I.	Intercept	Curve R^2 .99	CCV %D 20%	Method Blanks U	LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field Dup. RPD	Equip. Blanks U	Field Blanks U		
2691-41-0	HMX	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	NA		
121-82-4	RDX	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
99-35-4	1,3,5-Trinitrobenzene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
99-65-0	1,3-dinitrobenzene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
98-95-3	Nitrobenzene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
479-45-8	Tetryl	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
118-96-7	2,4,6-trinitrotoluene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
35572-78-2	2-amino-4,6-dinitrotoluene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
19406-51-0	4-amino-2,6-dinitrotoluene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
121-14-2	2,4-dinitrotoluene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
606-20-2	2,6-dinitrotoluene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
88-72-2	2-nitrotoluene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
99-99-0	4-nitrotoluene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
99-08-1	3-nitrotoluene	✓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓		
~~78-11-5~~	~~PETN~~																

Sample	SMC %REC	SMC RT	Sample	SMC %REC	SMC RT
Met	Criteria				

Comments:

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
Not	Required		Results	NDs	

Solids-to-aqueous conversion:
mg / kg = µg / g:[(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l Reviewed By: Kevin A Lambert Date: 10-27-05

Contract Verification Review (CVR)

Project Leader LANGKOPF Project Name FOOTHILLS SITE 58 Case No. 7213_02.02.06

AR/COC No. 608867, 608868, 608869 & 608870 Analytical Lab GEL SDG No. 145490

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met		X	LEAD FAILED RECOVERY LIMITS FOR MATRIX SPIKE DUPLICATE
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples		X	RPD FOR BARIUM, TOTAL-U AND U-238 OUTSIDE ACCEPTANCE RANGE
b) Matrix spike duplicate RPD data reported and met for all organic samples		X	RPD FOR ZINC OUTSIDE ACCEPTANCE RANGE
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	ZINC DETECTED IN BLANK
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	BARIUM, ZINC AND LEAD DETECTED IN EQUIPMENT BLANKS
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	X		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) Instrument run logs provided	X		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	X		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes (No)

Based on the review, this data package is complete. (Yes) No

If no, provide: nonconformance report or correction request number _____ and date correction request was submitted:-_____

Reviewed by: W. Palencia Date: 10-17-05 Closed by:_____ Date:_____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. V17

SMO Use

AR/COC 608867

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-14-05	Project/Task No.: 7213.02.02.06	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	54935	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	SWMU 58 Footprint Site 58	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.:	CFO55-05-06	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154

Reference LOV(available at SMO) 145490

	Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
1	070239-001	58O-GR-100-0-SS	0	58	091205/0940	soil	AG	8 oz	None	G	SA	Zinc (6020)	001
1	070239-011	58O-GR-100-0-SD	0	58	091205/0940	soil	AG	8 oz	None	G	DU	Zinc (6020)	002
1	070240-002	58O-GR-100-5-S	5	58	091205/1010	soil	AG	8 oz	None	G	SA	Barium (6020)	003
1-6	~~070241-002~~ 070391-002	58O-GR-100-10-S	10	58	091205/1039	soil	AG	8 oz	None	G	SA	Barium (6020)	004
5	070243-003	56O-GR-100-0-EB	0	58	091205/1407	DIW	P	500 ml	HNO3	C	EB	Zinc, Barium 145494	-001

RMMA	☐ Yes ☑ No	Ref. No.	**Sample Tracking**	Smo Use	**Special Instructions/QC Requirements**
Sample Disposal	☐ Return to Client	☑ Disposal by lab	Date Entered(mm/dd/yy)	09/22/05	**EDD** ☑ Yes ☐ No
Turnaround Time	☐ 7 Day ☐ 15 Day	☑ 30 Day	Entered by:	RK	**Level D Package** ☑ Yes ☐ No
Return Samples By:		☐ Negotiated TAT	QC inits.	JP	***Send report to:** Brenda Langkopf/Org 6146/MS1087/505-284-3272*

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Gilbert Quintana	Gilbert Quintana	GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

1.Relinquished by	William Gibson	Org. 6146	Date 9-14-05	Time 0915	4.Relinquished by		Org.	Date	Time
1. Received by	Robert Lynch for GMO	Org. 6146	Date 9-14-05	Time 0915	4. Received by		Org.	Date	Time
2.Relinquished by	Robert Lynch for GMO	Org. 6146	Date 9-14-05	Time 1230	5.Relinquished by		Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab | Page 1 of 2

Batch No. 2107 | SMO Use | AR/COC 608868

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-14-05	Project/Task No.: 7213.02.02.06	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	5493S	SMO Authorization: Email	-Send preliminary/copy report to:
Project Name:	SWMU 58 Foothills Site	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	ER097 04	SMO Contact/Phone:	Pam Puissant/505-284-3124	SEE BOTTLE ORDER	☑ Validation Required
Service Order No	CFO55-05-06	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 145490

Reference LOV(available at SMO)

	Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
1	070244-004	58S-GR-100-0-SS	0	58	091205/1430	soil	AG	8 oz	None	G	SA	HE (8330)	005
2	070244-004	58S-GR-100-0-SD	0	58	091205/1430	soil	AG	8 oz	None	G	DU	HE (8330)	006
3	070245-004	58S-GR-101-0-SS	0	58	091205/1433	soil	AG	8 oz	None	G	SA	HE (8330)	007
4	070246-004	58S-GR-102-0-SS	0	58	091305/1435	soil	AG	8 oz	None	G	SA	HE (8330)	008
5	070248-005	58X-GR-101-2-S	2	58	091305/0915	soil	AG	8 oz	None	G	SA	Fraction "005" read below	145493-001
6	070249-005	58X-GR-102-2-S	2	58	091305/0922	soil	AG	8 oz	None	G	SA	Fraction "005" read below	002
7	070250-005	58X-GR-102-2-SD	2	58	091305/0922	soil	AG	8 oz	None	G	DU	Fraction "005" read below	003
8	070251-005	58X-GR-103-2-S	2	58	091305/0927	soil	AG	8 oz	None	G	SA	Fraction "005" read below	004
9	070252-005	58X-GR-104-2-S	2	58	091305/0952	soil	AG	8 oz	None	G	SA	Fraction "005" read below	005
10	070253-005	58X-GR-105-2-S	2	58	091305/0945	soil	AG	8 oz	None	G	SA	Fraction "005" read below	006
11	070254-005	58X-GR-106-2-S	2	58	091305/0938	soil	AG	8 oz	None	G	SA	Fraction "005" read below	007

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking Smo Use	Special Instructions/QC Requirements
Sample Disposa	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy) 10/03/05	EDD ☑ Yes ☐ No
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by: RK	Level D Package ☑ Yes ☐ No
Return Samples By:	☐ Negotiated TAT	QC inits. WP	*Send report to: Brenda Langkopf/Org 6146/MS1087/505-284-3272

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Gillian Quintana	Gillian Quintana	GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

Fraction "005" Ur-235, Ur-238 and Total Uranium by ICP mass Spectroscopy

*Please list as separate report.

Abnormal Conditions on Receipt — Lab Use

1. Relinquished by	William Gibson	Org 6146	Date 9-14-05	Time 0915	4. Relinquished by	Org.	Date	Time
1. Received by	Email	Org 6146	Date 9-14-05	Time 0915	4. Received by	Org.	Date	Time
2. Relinquished by	Email	Org 6146	Date 9-14-05	Time 1230	5. Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3. Relinquished by		Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY

Analysis Request And Chain Of Custody (Continuation)

AR/COC- 608868

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf	Project/Task No.:	7213 .02.02.06
Location	Tech Area				
Building	Room	**Reference LOV (available at SMO)**			

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
070255-005	58X-GR-107-2-S	2	58	091305/0932	soil	AG	8 oz	None	G	SA	Fraction "005" read below	145493-008
070247-004	58S-GR-100-0-EB	0	58	091205/1446	DIW	AG	3x1Liter	None	C	EB	HE (8330)	145494-002

Abnormal Conditions on Receipt LAB USE

Recipient Initials _____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 608869

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-14-05	Project/Task No.:	7213.02.02.06
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	54935	SMO Authorization:	Oral to SMO
Project Name:	SWMU 58 Foothills Site 58	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		SOW BOTTLE ORDER
Logbook Ref. No.:	ER097 pg 6	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No:	CFO55-05 OK	Send Report to SMO:	Lorraine Herrera/505-844-3199		

☐ **Waste Characterization** -Send preliminary/copy report to:

☐ **Released by COC No.:** _____

☑ **Validation Required**

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154 145490

Location	Tech Area
Building	Room

Reference LOV(available at SMO)

	Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
E	070256-008	58FB2-GR-007-0-SS	0	58	091305/1259	soil	G	8 oz	None	G	SA	Lead (6020)	009
C	070256-005	58FB2-GR-007-2-S	2	58	091305/1327	soil	G	8 oz	None	G	SA	Fraction "005" read below	145493-009
A	070257-008	58FB2-GR-008-0-SS	0	58	091305/1302	soil	G	8 oz	None	G	SA	Lead (6020)	145490-010
G	070257-012	58FB2-GR-008-0-SD	0	58	091305/1302	soil	G	8 oz	None	G	DU	Lead (6020)	-011
B	070257-005	58FB2-GR-008-2-S	2	58	091305/1321	soil	G	8 oz	None	G	SA	Fraction "005" read below	145493-010
F	070258-008	58FB2-GR-009-0-SS	0	58	091305/1304	soil	G	8 oz	None	G	SA	Lead (6020)	145490-012
D	070258-005	58FB2-GR-009-2-S	2	58	091305/1334	soil	G	8 oz	None	G	SA	Fraction "005" read below	145493-011
I	070259-005	S58FB2-GR-001-2-S	2	58	091305/1340	soil	G	8 oz	None	G	SA	Fraction "005" read below	-012
J	070260-005	S58FB2-GR-002-2-S	2	58	091305/1348	soil	G	8 oz	None	G	SA	Fraction "005" read below	-013
H	070261-005	S58FB2-GR-003-2-S	2	58	091305/1327	soil	G	8 oz	None	G	SA	Fraction "005" read below	-014
A	070262-008	58FB2-GR-001-EB	0	58	091305/1352	DIW	P	500 ml	HNO3	G	SA	Lead	145494-003

RMMA	☐ Yes ☑ No	Ref. No.	
Sample Disposal	☐ Return to Client	☑ Disposal by lab	
Turnaround Time	☐ 7 Day	☐ 15 Day	☑ 30 Day
Return Samples By:		☐ Negotiated TAT	

Sample Tracking — Smo Use
Date Entered(mm/dd/yy): 10/03/05
Entered by: RK
QC inits. WP

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272
Fraction "005" Ur-235, Ur-238 and Total Uranium by ICP mass Spectroscopy

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson		WG	Weston/6146/284-5232/23907367
	Gilbert Quintana		GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch		RL	Weston/6146/250-7090

1.Relinquished by		Org. 6146	Date 9-14-05	Time 0915	4.Relinquished by		Org.	Date	Time
1. Received by		Org. 6146	Date 9-14-05	Time 0915	4. Received by		Org.	Date	Time
2.Relinquished by		Org. 6146	Date 9-14-05	Time 1230	5.Relinquished by		Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 608870

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-14-05	Project/Task No.: 7213.02.02.06	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	54935	SMO Authorization: 04 Low Grad	-Send preliminary/copy report to:
Project Name:	SWMU 58 Foothills ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL	See Bottle Order	☐ Released by COC No.:
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.	CFO55-06 06 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 145490

Reference LOV(available at SMO)

	Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
4	070263-008	58UP1-GR-001-2-S	2	58	091305/1100	soil	AG	8 oz	None	G	SA	Lead (6020)	013
5	070264-010	58UP1-GR-002-0-SS	0	58	091305/1010	soil	G	8 oz	None	G	SA	Gamma Spectroscopy	018
6	070264-008	58UP1-GR-002-2-S	2	58	091305/1031	soil	AG	8 oz	None	G	SA	Lead (6020)	014
7	070265-010	58UP1-GR-003-0-SS	0	58	091305/1014	soil	G	8 oz	None	G	SA	Gamma Spectroscopy	019
8	070265-008	58UP1-GR-003-2-S	2	58	091305/1043	soil	AG	8 oz	None	G	SA	Lead (6020)	015
9	070265-012	58UP1-GR-003-2-SD	2	58	091305/1043	soil	AG	8 oz	None	G	DU	Lead (6020)	016
10	070266-010	58UP1-GR-004-0-SS	0	58	091305/1017	soil	G	8 oz	None	G	SA	Gamma Spectroscopy	020
11	070266-008	58UP1-GR-004-2-S	2	58	091305/1053	soil	AG	8 oz	None	G	SA	Lead (6020)	017
12	070267-008	58UP1-GR-003-0-EB	0	58	091305/1104	DIW	P	500 ml	HNO3	C	EB	Lead 145494-004	

RMMA	☐ Yes ☑ No Ref. No.	**Sample Tracking** Smo Use	**Special Instructions/QC Requirements**
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy) 10/03/05	EDD ☑ Yes ☐ No
Turnaround Time	☐ 7 Day ☐ 15 Day (☑ 30 Day)	Entered by: RK	Level D Package ☑ Yes ☐ No
Return Samples To:	☐ Negotiated TAT	QC inits. WP	*Send report to: Brenda Langkopf/Org 6146/MS1087/505-284-3272

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Gilbert Quintana	Gilbert Quintana	GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

*Please list as separate report.

1.Relinquished by	William Gibson	Org. 6146	Date 9-14-05	Time 0915	4.Relinquished by	Org.	Date	Time
1. Received by	Gilbert Quintana	Org. 6146	Date 9-14-05	Time 0915	4. Received by	Org.	Date	Time
2.Relinquished by	Gilbert Quintana	Org. 6146	Date 9-14-05	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

October 2005 Feature 58FF Samples
AR/COCs 608871–608877

RECORDS CENTER CODE: ER/1332/58/DAT

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: Foothills Site 58 PROJECT/TASK: 7213_02.02.06

SNL TASK LEADER: Langkopf ORG/MS/CF0#: 6146/1087/CF055-06

SMO PROJECT LEAD: Herrera SAMPLE SHIP DATE: 10/24/2005

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
608871	GEL	148613		11/18/2005	X	X	X	X
608872	GEL	148613		11/18/2005	X	X	X	X
608873	GEL	148613		11/18/2005	X	X	X	X
608874	GEL	148613		11/18/2005	X	X	X	X
608875	GEL	148613		11/18/2005	X	X	X	X
608876	GEL	148613		11/18/2005	X	X	X	X
608877	GEL	148613		11/18/2005	X	X	X	X

DATA PACKAGE TAT:		RUSH	X	NORMAL
CORRECTIONS REQUESTED BY/DATE:				
PROBLEM #/DATE CORRECTION RECEIVED:				
CVR COMPLETED BY/DATE:	W. Palencia		11-21-05	
FINAL TRANSMITTED TO/DATE:	Langkopf		11-21-05	
SENT TO VALIDATION BY/DATE:	R. Kavanaugh		11-22-05	
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):				
P/U 12/5/05 VALIDATION COMPLETED BY/DATE:	David Schwartz		11-30-05	
COPY TO WM BY/DATE:				
CD REQUESTED BY/DATE				
CD RECEIVED BY/DATE	R. Kavanaugh		11/18/2005	
TO ERDMS OR RECORDS CENTER BY/DATE:	R. Kavanaugh		12-5-05	

COMMENTS:

Sample Findings Summary

Site: Foothills Site 58 **AR/COC:** 608871,872,873,874,875,876,877 **Inorganic**

Sample ID	Method/CAS Number (Analysis/Analyte)																	
	EPA6010B (ICP):	7439-92-1 (Pb)	7440-02-0 (Ni)															
070283-006 58FF-GR-BH8-EB			UJ,B3															
070299-006 58FF-GR-BH9-EB			UJ,B3															
070315-006 58FF-GR-BH10-EB			UJ,B3															
070331-006 58FF-GR-BH11-EB			UJ,B3															
070347-006 58FF-GR-BH12-EB			UJ,B3															
070363-006 58FF-GR-BH13-EB			UJ,B3															
070369-006 58FF-GR-FF-001-EB			UJ,B3															
070268-006 58FF-GR-BH8-005-S		J,B2																
070285-015 58FF-GR-BH9-010-SD		J,B2																
070286-006 58FF-GR-BH9-015-S		J,B2																
070288-006 58FF-GR-BH9-025-S		J,B2																
070301-006 58FF-GR-BH10-010-S		J,B2																
070301-015 58FF-GR-BH10-010-SD		J,B2																

Validated By: David Schwent

Mr. David Schwent

Date: 11/30/05

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

DATE: November 30, 2005

TO: File

FROM: David Schwent

SUBJECT: Inorganic Data Review and Validation - SNL
Site: Foothills Site 58
AR/COCs: 608871,872,873,874,875,876,877
SDGs: 148613 (148615, 148616, 148617, 148618, 148619, 148620)
Laboratory: STL
Project/Task: 7213.02.02.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using method EPA6010B (ICP). Problems were identified with the data package that result in the qualification of data.

ICP Analysis (Batch 475327):

Blanks: Ni was detected in the initial calibration blank (ICB) and the continuing calibration blank (CCB) at negative concentrations with absolute values > the detection limit (DL) but < the reporting limit (RL). The associated Ni results of Samples 148613-001 thru -007 were non-detects (NDs) and will be qualified "UJ,B3."

ICP Analysis (Batch 475329):

Blanks: Pb was detected in the equipment blank (EB) (Sample 148613-001) at a concentration < the RL. The associated Pb result of Sample 148615-001 was a detect <5X the EB concentration and will be qualified "J,B2."

ICP Analysis (Batch 475331):

Blanks: Pb was detected in the EB (Sample 148613-002) at a concentration < the RL. The associated Pb results of Samples 148616-003, -004, and -006 were detects <5X the EB concentration and will be qualified "J,B2."

ICP Analysis (Batch 475341):

Blanks: Pb was detected in the EB (Sample 148613-003) at a concentration < the RL. The associated Pb results of Samples 148617-002 and -003 were detects <5X the EB concentration and will be qualified "J,B2."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All ICP Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All ICP Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

ICP Analysis (Batch 475327): No target analytes were detected in the blanks, except as noted above in the summary section.

ICP Analysis (Batch 475329): No target analytes were detected in the blanks, except as noted above in the summary section and the following. Ni was detected in the method blank (MB) at a concentration < the RL. However, all associated Ni sample results were >5X the MB concentration and will not be qualified. Pb was detected in the EB (Sample 148613-001) at a concentration < the RL. However, all associated Pb sample results were >5X the EB concentration and will not be qualified.

ICP Analysis (Batch 475331): No target analytes were detected in the blanks, except as noted above in the summary section and the following. Pb was detected in the EB (Sample 148613-002) at a concentration < the RL. However, all associated Pb sample results, except for the results of Samples 148616-003, -004, and -006, were >5X the EB concentration and will not be qualified.

ICP Analysis (Batch 475341): No target analytes were detected in the blanks, except as noted above in the summary section and the following. Pb was detected in the EB (Sample 148613-003) at a concentration < the RL. However, all associated Pb sample results, except for the results of Samples 148617-002 and -003, were >5X the EB concentration and will not be qualified.

ICP Analysis (Batch 475343): No target analytes were detected in the blanks, except the following. Ni was detected in the CCB at a concentration < the RL. However, all associated Ni sample results were >5X the CCB concentration and will not be qualified.

ICP Analysis (Batch 475345): No target analytes were detected in the blanks, except the following. Pb was detected in the MB and the EB (Sample 148613-007) at concentrations < the RL. However, all associated Pb sample results were detects >5X the MB concentration and >5X the EB concentration and will not be qualified.

ICP Analysis (Batch 475347): No target analytes were detected in the blanks, except the following. Ni was detected in the MB at a concentration < the RL. However, all associated Ni sample results were >5X the MB concentration and will not be qualified. Pb was detected in the EBs (Sample 148613-006 and -007) at concentrations < the RL. However, all associated Pb sample results were detects >5X the EB concentrations and will not be qualified.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

ICP Analysis (Batch 475327): All LCS/LCSD QC acceptance criteria were met.

All Other ICP Analyses: All LCS QC acceptance criteria were met. No LCSD analyses were performed. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

ICP Analysis (Batch 475327): All MS QC acceptance criteria were met, except the following. No MS analysis was performed, resulting in no applicable MS analysis for the field samples of this batch. However, all samples of this batch were EBs and no sample data will be qualified as a result. No MSD analyses were performed. The LCSD analysis was used as a measure of laboratory precision. No sample data will be qualified as a result.

All Other ICP Analyses: All MS/MSD QC acceptance criteria were met.

Replicates

ICP Analysis (Batch 475327): All replicate QC acceptance criteria were met, except the following. No laboratory replicate analysis was performed. However, all samples of this batch were EBs and the LCSD analysis was used as a measure of laboratory precision. No sample data will be qualified as a result.

ICP Analysis (Batch 475347): All replicate QC acceptance criteria were met, except the following. The laboratory replicate relative percent difference (RPD) of As (23%) was >20%. However, the RPD was above the QC acceptance limit by only 3% and the matrix was soil, for which an RPD of 35% is acceptable. Therefore, based on professional judgment, no sample data will be qualified as a result.

All Other ICP Analyses: All replicate QC acceptance criteria were met.

ICP Serial Dilution

All IPC Analyses: All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

All ICP Analyses: All ICS AB QC acceptance criteria were met.

Detection Limits/Dilutions

ICP Analysis (Batch 475329): All detection limits were properly reported. Sample 148615-001 was diluted 10X for As, Pb, and Ni to bring the concentrations of the target analytes into the linear range of the instrument. No other samples required dilution.

ICP Analysis (Batch 475331): All detection limits were properly reported. Samples 148616-003, -004, and -006 were diluted 2X for Pb to bring the concentrations of the target analyte into the linear range of the instrument. No other samples required dilution.

ICP Analysis (Batch 475341): All detection limits were properly reported. Samples 148617-002 and -003 were diluted 2X for Pb to bring the concentrations of the target analyte into the linear range of the instrument. No other samples required dilution.

ICP Analysis (Batch 475343): All detection limits were properly reported. Samples 148618-003 and -005 were diluted 2X for Pb to bring the concentrations of the target analyte into the linear range of the instrument. No other samples required dilution.

Data Validation Summary

Site/Project: SNL/Foothills Site 58 Project/Task #: 7213.02.02.06 # of Samples: 109 Matrix: Soil

AR/COC #: 608871, -872, -873, -874, -875, -876, and -877 Laboratory Sample IDs: 148613-001 thru -007; 148615-001 thru -016; 148616-001 thru -016; 148617-001 thru -016; 148618-001 thru -016; 148619-001 thru -019; 148620-001 thru -019.

Laboratory: GEL

SDG #: 148613, -615, -616, -617, -618, -619, and -620

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation					✓					
2. Calibrations					✓					
3. Method Blanks / Equipment Blanks					UJ, B3 J, B2					
4. MS/MSD					✓					
5. Laboratory Control Samples					✓					
6. Replicates					✓					
7. Surrogates					NA					
8. Internal Standards					NA					
9. TCL Compound Identification					NA					
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries					NA					
13. Other QC										

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: David Schmont Date: 11-22-05

Inorganic Metals

Site/Project: SNL/~~Foothills~~ Site 58 AR/COC #: 60887 1,871,873,874,875, 876, 877 Laboratory Sample IDs: 148613-oo thru -007

Laboratory: GEL SDG #: 148613 (Equipment Blanks)

Methods: EPA 6010B (ICP)

# of Samples: 7 Matrix: ~~Soil~~ Aqueous on 4-22-05 DI water Batch #s: 475327

CAS #/ Analyte	QC Element																		
	TAL	ICV	CCV	ICB mg/L	CCB mg/L	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	✓	✓	NA	NA	NA	
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni	✓	✓	✓	-2.18	-1.57	✓	✓	✓	✓	NA	NA	NA	NA	✓	✓	NA	NA	NA	
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	✓	✓	NA	NA	NA	
7782-49-2 Se																			
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	✓	✓	NA	NA	NA	
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg																			
Cyanide CN																			

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: No MS/MSD or Laboratory replicate analyses were performed → Lack of MS analysis LCSD was used as measure of precision.

Reviewed By: David Schwent Date: 11-22-05

Inorganic Metals

Site/Project: SM/Foothills Site 58 AR/COC #: 608871,872,873,874,875,876,877 Laboratory Sample IDs: 148615-001 thru -016.

Laboratory: GEL SDG #: 148613 (148615)

Methods: EPA 6010B (ICP)

# of Samples: 16 Matrix: Soil Batch #s: 475329

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB	CCB	Method Blanks mg/kg	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	* Equip. Blanks mg/L	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓		
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	0.110	✓	NA	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓		
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	✓	0.00344	✓		
7782-49-2 Se																				
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓		
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: * Eq = 148613-001 From Batch 475327.

Reviewed By: David Schwarz Date: 11-28-05

Inorganic Metals

Site/Project: SNL/Foothills Site 58 AR/COC #: 60871,872,873,874,875,876,877 Laboratory Sample IDs: 148616-001 thru -016.

Laboratory: GEL SDG #: 148613 (148616)

Methods: EPA 6010B (ICP)

# of Samples: 16 Matrix: Soil Batch #s: 475331

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	* Equip. Blanks mg/L	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	0.011	NA		
7782-49-2 Se																				
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: * EB= Sample 148613-002 From Batch 475327.

Reviewed By: David Schwartz Date: 11-28-05

Inorganic Metals

Site/Project: SNL/Foothills Site 58 AR/COC #: 60887, 872, 873, 874, 875, 876, 877 Laboratory Sample IDs: 148617-001 thru -016

Laboratory: GEL SDG #: 148613 (148617)

Methods: EPA 6010B (ICP)

# of Samples: 16 Matrix: Soil Batch #s: 475341

CAS #/ Analyte	QC Element																		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	* Equip. Blanks mg/L	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA	
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA	
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	0.0103	NA	
7782-49-2 Se																			
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA	
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg																			
Cyanide CN																			

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: EB = Sample 148613-003 from Batch 475327.

Reviewed By: David Schwartz Date: 11-28-05

Inorganic Metals

Site/Project: SNL/Foothills Site 58 AR/COC #: 608871, 872, 873, 874, 875, 876, 877 Laboratory Sample IDs: 148618-001 thru -016.

Laboratory: GEL SDG #: 148613 (148618)

Methods: EPA 6010B (ICP)

# of Samples: 16 Matrix: Soil Batch #s: 475343

CAS #/ Analyte	QC Element																*			
	TAL	ICV	CCV	ICB	CCB mg/L	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	1.33	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7782-49-2 Se																				
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: EB = Sample 148613-004 from Batch 475327

Reviewed By: David Schwent Date: 11-28-05

Inorganic Metals

Site/Project: SNL/Foothills Sb 58 AR/COC #: 608871,872,873,874,875,876 Laboratory Sample IDs: 148619-001 thru -019

Laboratory: GEL SDG #: 148619 (148619)

Methods: EPA 6010B (ICP)

# of Samples: 19 Matrix: Soil Batch #s: 475345

CAS # / Analyte	QC Element																*			
	TAL	ICV	CCV	ICB	CCB	Method Blanks mg/kg	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks mg/l	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	0.633	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓/0.00363	NA		
7782-49-2 Se																				
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: * EB Sample 148613-005 (Batch 475327) applies to Samples 148619-001 thru -016 (1st entry = MD)
EB Sample 148613-007 (1)
applies to Samples 148619-017 thru -019 (2nd entry).

Reviewed By: David Schwarz Date: 11-29-05

Inorganic Metals

Site/Project: SW Kentucky Site 58 AR/COC #: 871, 872, 873, 874, 875, 876, 877. Laboratory Sample IDs: 148620-001 thru -019

Laboratory: CEL SDG #: 148613 (148620)

Methods: EPA 6010B (ICP)

# of Samples: 19 Matrix: Soil Batch #s: 475347

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB	CCB ug/l	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks mg/l	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	1.18	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	✓	NA		
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	0.00424, 0.00363	NA		
7782-49-2 Se																				
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	23	✓	✓	NA	✓	NA		
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: * EB Sample 148613-006 (Batch 475327) applies to Samples 148620-001 thru -016. (1st entry)
EB Sample 148613-007 (|)
applies to Samples 148620-017 thru -020 (2nd entry)

Reviewed By: David Schwartz Date: 11-30-05

Contract Verification Review (CVR)

Project Leader LANGKOPF Project Name FOOTHILLS SITE 58 Case No. 7213_02.02.06

AR/COC No. 608871—608877 Analytical Lab GEL SDG No. 148613

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	N/A				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples		X	RPD FOR ARSENIC OUTSIDE ACCEPTANCE RANGE
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	NICKEL AND LEAD DETECTED IN BLANKS
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	LEAD DETECTED IN SEVERAL EQUIPMENT BLANKS
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. SMO Use

AR/COC 608871

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-24-05	Project/Task No.:	7213.02.02.06
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	56460	SMO Authorization:	
Project Name:	SWMU 58	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No.:	CFO55-06	Send Report to SMO:	Lorraine Herrera/505-844-3199		

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:
☐ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location	Tech Area
Building	Room

Reference LOV(available at SMO) 14863

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070268-006	58FF-GR-BH8-005-S	5	58	101905/1434	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070269-006	58FF-GR-BH8-010-S	10	58	101905/1443	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070269-015	58FF-GR-BH8-010-SD	10	58	101905/1443	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,Lead,& Nickel	
070270-006	58FF-GR-BH8-015-S	15	58	101905/1452	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070271-006	58FF-GR-BH8-020-S	20	58	101905/1458	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070272-006	58FF-GR-BH8-025-S	25	58	101905/1503	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070273-006	58FF-GR-BH8-030-S	30	58	101905/1512	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070274-006	58FF-GR-BH8-035-S	35	58	101905/1520	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070275-006	58FF-GR-BH8-040-S	40	58	101905/1528	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070276-006	58FF-GR-BH8-045-S	45	58	101905/1534	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070277-006	58FF-GR-BH8-050-S	50	58	101905/1551	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	

RMMA ☐ Yes ☐ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy) 10/25/05
Entered by: KK
QC inits. LH

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272
*Please list as separate report.

Abnormal Conditions on Receipt
Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Gilbert Quintana	Gilbert Quintana	GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

1.Relinquished by	William Gibson	Org. 6146	Date 10/26/05	Time 0955	4.Relinquished by	Org.	Date	Time
1. Received by		Org.	Date	Time	4. Received by	Org.	Date	Time
2.Relinquished by		Org. 6146	Date 10-26-05	Time	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 908871

Project Code: | SWMU #: Tech Area

Location: | Room:

Building #:

Project/Task Manager: Brenda Langkopf | Project/Task No: 7215.02.02.05

Reference LOV (available at SMO)

Sample No / Fraction	ER Sample ID / Sample Location detail	Pump Length (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
070278-006	58FF-GR-BH8-060-S	60	58	101905/1616	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070279-006	58FF-GR-BH8-070-S	70	58	101905/1642	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070280-006	58FF-GR-BH8-080-S	80	58	101905/1702	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070281-006	58FF-GR-BH8-090-S	90	58	101905/1726	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070282-006	58FF-GR-BH8-100-S	100	58	101905/1753	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070283-006	58FF-GR-BH8-EB	0	58	101905/1741	DIW	P	500 ml	HNO3	G	EB	Arsenic,Beryllium,Lead,& Nickel	

Abnormal Conditions on Receipt

LAB USE

Recipient Initials

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 608872

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-24-05	Project/Task No.:	7213.02.02.06
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	56460	SMO Authorization:	
Project Name:	SWMU 58	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No.:	CFO55-06	Send Report to SMO:	Lorraine Herrera/505-844-3199		

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:
☑ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location	Tech Area
Building	Room

Reference LOV(available at SMO) 148613

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070284-008	58FF-GR-BH9-005-S	5	58	101805/0945	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070285-009	58FF-GR-BH9-010-S	10	58	101805/0955	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070286-015	58FF-GR-BH9-010-SD	10	58	101805/0955	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,Lead,& Nickel	
070286-003	58FF-GR-BH9-015-S	15	58	101805/0959	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070287-[illegible]	58FF-GR-BH9-020-S	20	58	101805/1005	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070288-[illegible]	58FF-GR-BH9-025-S	25	58	101805/1011	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070289-[illegible]	58FF-GR-BH9-030-S	30	58	101805/1016	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070290-[illegible]	58FF-GR-BH9-035-S	35	58	101805/1023	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070291-[illegible]	58FF-GR-BH9-040-S	40	58	101805/1043	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070292-[illegible]	58FF-GR-BH9-045-S	45	58	101805/1050	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070293-006	58FF-GR-BH9-050-S	50	58	101805/1109	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Sample Tracking Smo Use

Date Entered(mm/dd/yy) 10/25/05

Entered by: RK

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☑ Yes ☐ No

Abnormal Conditions on Receipt

Return Samples By:

☐ Negotiated TAT QC Inits. WX

*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272

*Please list as separate report.

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Gilbert Quintana	Gilbert Quintana	GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

1.Relinquished by	William Gibson	Org.	6146	Date	10/26/05	Time	0955	4.Relinquished by	Org.	Date	Time
1. Received by		Org.		Date		Time		4. Received by	Org.	Date	Time
2.Relinquished by		Org.		Date		Time		5.Relinquished by	Org.	Date	Time
2. Received by		Org.		Date		Time		5. Received by	Org.	Date	Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 608872

Project Name:	SWMU 58	Project/Task Manager:	Brenda Langkopf	Project/Task No.:	7213.02.02.06
Location	Tech Area				
Building	Room	Reference LOV (available at SMO)			

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
✓070294-006	58FF-GR-BH9-060-S	60	58	101805/1129	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓070295-006	58FF-GR-BH9-070-S	70	58	101805/1147	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓070296-006	58FF-GR-BH9-080-S	80	58	101805/1221	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓070297-006	58FF-GR-BH9-090-S	90	58	101805/1255	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓070298-006	58FF-GR-BH9-100-S	100	58	101805/1315	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓070299-006	58FF-GR-BH9-EB	0	58	101805/1303	DIW	P	500 ml	HNO3	C	EB	Arsenic,Beryllium,Lead,& Nickel	

Abnormal Conditions on Receipt

LAB USE

Recipient Initials _____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 608873

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-24-05	Project/Task No.:	7213.02.02.06 ✓
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	56960	SMO Authorization:	S/L Signed
Project Name:	SWMU 58 ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No.	CFO55-06 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		

☐ **Waste Characterization**
Send preliminary/copy report to:

☐ **Released by COC No.:**
☐ **Validation Required**

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location	Tech Area
Building	Room

Reference LOV(available at SMO) 148613

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 070300-006	58FF-GR-BH10-005-S	5	58	101905/0755	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070301-005	58FF-GR-BH10-010-S	10	58	101905/0805	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070301-015	58FF-GR-BH10-010-SD	10	58	101905/0805	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,Lead,& Nickel	
✓ 070302-006	58FF-GR-BH10-015-S	15	58	101905/0811	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070303-006	58FF-GR-BH10-020-S	20	58	101905/0816	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070304-006	58FF-GR-BH10-025-S	25	58	101905/0821	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070305-006	58FF-GR-BH10-030-S	30	58	101905/0827	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070306-006	58FF-GR-BH10-035-S	35	58	101905/0833	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070307-006	58FF-GR-BH10-040-S	40	58	101905/0843	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070308-006	58FF-GR-BH10-045-S	45	58	101905/0857	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070309-006	58FF-GR-BH10-050-S	50	58	101905/0910	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking Smo Use
Date Entered(mm/dd/yy) 10/26/05
Entered by: RC
QC inits. LH

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Gilbert Quintana	Gilbert Quintana	GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

1.Relinquished by	William Gibson	Org.	6146	Date	10/26/05	Time	0955	4.Relinquished by	Org.	Date	Time
1. Received by	[illegible]	Org.	[illegible]	Date	[illegible]	Time	[illegible]	4. Received by	Org.	Date	Time
2.Relinquished by	[illegible]	Org.	[illegible]	Date	[illegible]	Time	[illegible]	5.Relinquished by	Org.	Date	Time
2. Received by		Org.		Date		Time		5. Received by	Org.	Date	Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 608873

Project Name:	SWMU 58	Project/Task Manger:	Brenna Langkopf	Project/Task No.:	7213.02.02.06
Location	Tech Area				
Building	Room	Reference LOV (available at SMO)			

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
070310-006	58FF-GR-BH10-060-S	60	58	101905/0937	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070311-006	58FF-GR-BH10-070-S	70	58	101905/0950	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070312-006	58FF-GR-BH10-080-S	80	58	101905/1030	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070313-006	58FF-GR-BH10-090-S	90	58	101905/1059	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070314-006	58FF-GR-BH10-100-S	100	58	101905/1145	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070315-006	58FF-GR-BH10-EB	0	58	101905/1155	DIW	P	500 ml	HNO3	C	EB	Arsenic,Beryllium,Lead,& Nickel	

Abnormal Conditions on Receipt

LAB USE

Recipient Initials__ _____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 608874

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-24-05	Project/Task No.:	7213.02.02.06
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	56460	SMO Authorization:	503 Sent
Project Name:	SWMU 58	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No.	CFO55-06	Send Report to SMO:	Lorraine Herrera/505-844-3199		

See Bottle Order

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:
☑ Validation Required

Bill To:Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location	Tech Area
Building	Room

Reference LOV(available at SMO) 14813

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070316-006	58FF-GR-BH11-005-S	5	58	102205/1253	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070317-006	58FF-GR-BH11-010-S	10	58	102205/1302	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070317-015	58FF-GR-BH11-010-SD	10	58	102205/1302	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,Lead,& Nickel	
070318-006	58FF-GR-BH11-015-S	15	58	102205/1308	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070319-006	58FF-GR-BH11-020-S	20	58	102205/1314	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070320-006	58FF-GR-BH11-025-S	25	58	102205/1319	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070321-006	58FF-GR-BH11-030-S	30	58	102205/1329	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070322-006	58FF-GR-BH11-035-S	35	58	102205/1334	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070323-006	58FF-GR-BH11-040-S	40	58	102205/1350	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070324-006	58FF-GR-BH11-045-S	45	58	102205/1403	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070325-006	58FF-GR-BH11-050-S	50	58	102205/1420	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	10/26/05
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	RK
Return Samples By:	☐ Negotiated TAT	QC inits.	LT

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No

*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson		WG	Weston/6146/284-5232/23907367
	Gilbert Quintana		GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch		RL	Weston/6146/250-7090

1.Relinquished by		Org.	146	Date	10-24-05	Time	0715	4.Relinquished by	Org.	Date	Time
1. Received by		Org.	146	Date	10-24-05	Time	0715	4. Received by	Org.	Date	Time
2.Relinquished by		Org.	146	Date	10-24-05	Time	1136	5.Relinquished by	Org.	Date	Time
2. Received by		Org.		Date		Time		5. Received by	Org.	Date	Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 608874

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf		Project/Task No.:	7213 .02.02.06						
Location	Tech Area	Reference LOV (available at SMO)										Lab use
Building	Room											
Sample No- Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070326-006	58FF-GR-BH11-060-S	60	58	102205/1443	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070327-006	58FF-GR-BH11-070-S	70	58	102205/1503	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070328-006	58FF-GR-BH11-080-S	80	58	102205/1528	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070329-006	58FF-GR-BH11-090-S	90	58	102205/1554	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070330-006	58FF-GR-BH11-100-S	100	58	102205/1648	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070331-006	58FF-GR-BH11-EB	0	58	102205/1622	DIW	P	500 ml	HNO3	C	EB	Arsenic,Beryllium,Lead,& Nickel	

Abnormal Conditions on Receipt

LAB USE

Recipient Initials _____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 608875

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-24-05	Project/Task No.: 7213.02.02.06	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	56460	SMO Authorization: [illegible]	Send preliminary/copy report to:
Project Name:	SWMU 58	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL	See Bottle QAQC	☐ Released by COC No.:
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No:	CFO55-06	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room	Reference LOV(available at SMO)	148613		Albuquerque, NM 87185-0154

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070332-006	58FF-GR-BH12-005-S	5	58	102105/1623	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070333-006	58FF-GR-BH12-010-S	10	58	102105/1631	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070333-010	58FF-GR-BH12-010-SD	10	58	102105/1631	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,Lead,& Nickel	
070334-006	58FF-GR-BH12-015-S	15	58	102105/1634	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070335-006	58FF-GR-BH12-020-S	20	58	102105/1641	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070336-006	58FF-GR-BH12-025-S	25	58	102105/1646	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070337-006	58FF-GR-BH12-030-S	30	58	102105/1655	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070338-006	58FF-GR-BH12-035-S	35	58	102105/1659	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070339-006	58FF-GR-BH12-040-S	40	58	102105/1708	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070340-006	58FF-GR-BH12-045-S	45	58	102105/1720	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070341-006	58FF-GR-BH12-050-S	50	58	102105/1740	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	10/26/05
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	KK
Return Samples By:	☐ Negotiated TAT	QC inits.	[illegible]

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☐ No

*Send report to:

Brenda Langkopf/Org 6146/MS1087/505-284-3272

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	[signature]	WG	Weston/6146/284-5232/23907367
	Gilbert Quintana	[signature]	GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch	[signature]	RL	Weston/6146/250-7090

*Please list as separate report.

1.Relinquished by	[signature]	Org. 6146	Date 10-26-05	Time 0700	4.Relinquished by	Org.	Date	Time
1. Received by	[signature]	Org. 6146	Date 10-27-05	Time 0820	4. Received by	Org.	Date	Time
2.Relinquished by	[signature]	Org. 6146	Date 10-27-05	Time 1130	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 60887

Project Name: SWMU 58	Project/Task Manager: Brenda Langkopf	Project/Task No.: 7213 .02.02.06									
Location Tech Area	Reference LOV (available at SMO)										Lab use
Building Room											
Sample No- Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070342-006	58FF-GR-BH12-060-S	60	58	102105/1758	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070343-006	58FF-GR-BH12-070-S	70	58	102205/0808	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070344-006	58FF-GR-BH12-080-S	80	58	102205/0825	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070345-006	58FF-GR-BH12-090-S	90	58	102205/0854	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070346-006	58FF-GR-BH12-100-S	100	58	102205/0911	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070347-006	58FF-GR-BH12-EB	0	58	102205/0928	DIW	P	500 ml	HNO3	C	EB	Arsenic,Beryllium,Lead,& Nickel	

Abnormal Conditions on Receipt

LAB USE

Recipient Initials_____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 608876

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-24-05	Project/Task No.:	7213.02.02.06
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	56460	SMO Authorization:	S/B SENT
Project Name:	SWMU 58	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		See Bottle Order
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No.:	CEO55-06	Send Report to SMO:	Lorraine Herrera/505-844-3199		
Location	Tech Area				
Building	Room				

☐ **Waste Characterization** -Send preliminary/copy report to:

☐ **Released by COC No.:**

☑ **Validation Required**

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Reference LOV(available at SMO) 148613

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070348-006	58FF-GR-BH13-005-S	5	58	102305/1146	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070349-006	58FF-GR-BH13-010-S	10	58	102305/1159	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070349-015	58FF-GR-BH13-010-SD	10	58	102305/1159	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,Lead,& Nickel	
070350-006	58FF-GR-BH13-015-S	15	58	102305/1208	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070351-006	58FF-GR-BH13-020-S	20	58	102305/1213	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070352-006	58FF-GR-BH13-025-S	25	58	102305/1218	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070353-006	58FF-GR-BH13-030-S	30	58	102305/1230	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070354-006	58FF-GR-BH13-035-S	35	58	102305/1240	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070355-006	58FF-GR-BH13-040-S	40	58	102305/1259	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070356-006	58FF-GR-BH13-045-S	45	58	102305/1309	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070357-006	58FF-GR-BH13-050-S	50	58	102305/1330	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Sample Tracking — Smo Use
Date Entered(mm/dd/yy) 10/26/05
Entered by. RL

☐ Negotiated TAT QC Inits. LH

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☐ No
*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Return Samples By:

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

1.Relinquished by	William Gibson	Org.	6146	Date	10-24-05	Time	0907	4.Relinquished by	Org.	Date	Time
1. Received by	Robert Lynch	Org.	6146	Date	10-24-05	Time	0907	4. Received by	Org.	Date	Time
2.Relinquished by	Robert Lynch	Org.	6146	Date	10-24-05	Time	1130	5.Relinquished by	Org.	Date	Time
2. Received by		Org.		Date		Time		5. Received by	Org.	Date	Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org	Date	Time

OFF-SITE LABORATORY

Analysis Request And Chain Of Custody (Continuation)

AR/COC- 60887

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf	Project/Task No.:	7213_02.02.06
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
070358-006	58FF-GR-BH13-060-S	60	58	102305/1348	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070359-006	58FF-GR-BH13-070-S	70	58	102305/1410	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070360-006	58FF-GR-BH13-080-S	80	58	102305/1444	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070361-006	58FF-GR-BH13-090-S	90	58	102305/1526	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070362-006	58FF-GR-BH13-100-S	100	58	102305/1557	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
070363-006	58FF-GR-BH13-EB	0	58	102305/1543	DIW	P	500 ml	HNO3	C	EB	Arsenic,Beryllium,Lead,& Nickel	

Abnormal Conditions on Receipt **LAB USE**

Recipient Initials__ ____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 608877

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-24-05	Project/Task No.: 7213.02.02.06	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	56460	SMO Authorization: [illegible]	Send preliminary/copy report to:
Project Name:	SWMU 58 ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL	[illegible]	☐ Released by COC No.:
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.:	CFO55-06 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To:Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154

Reference LOV(available at SMO) 148613

Sample No. Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 070364-006	58FF-GR-FF-060-S	60	58	101705/1320	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070365-006	58FF-GR-FF-070-S	70	58	101705/1353	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070365-015	58FF-GR-FF-070-SD	70	58	101705/1353	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,Lead,& Nickel	
✓ 070366-006	58FF-GR-FF-080-S	80	58	101705/1418	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070367-006	58FF-GR-FF-090-S	90	58	101705/1445	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070368-006	58FF-GR-FF-100-S	100	58	101705/1503	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	
✓ 070369-006	58FF-GR-FF-001-EB	0	58	101705/1451	DIW	P	500 ml	HNO3	G	EB	Arsenic,Beryllium,Lead,& Nickel	

RMMA	☐ Yes ☑ No Ref. No.	**Sample Tracking**	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	10/26/05
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	RK
Return Samples By:	☐ Negotiated TAT	QC inits.	LH

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☑ Yes ☐ No

*Send report to:

Brenda Langkopf/Org 6146/MS1087/505-284-3272

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	[signature]	WTG	Weston/6146/284-5232/23907367
	Mike Sanders	[signature]	MS	Gram/6146/263-3442

1.Relinquished by	[signature]	Org. [illegible]	Date 10/20/05	Time 0955	4.Relinquished by		Org.	Date	Time
1. Received by	[signature]	Org. [illegible]	Date 10/20/05	Time 0955	4. Received by		Org.	Date	Time
2.Relinquished by	[signature]	Org. [illegible]	Date [illegible]	Time [illegible]	5.Relinquished by		Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

October 2005 Feature 58FF Samples
AR/COCs 608878 and 608880

RECORDS CENTER CODE: ER/1332/58/DAT

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: Foothills Site 58 PROJECT/TASK: 7213_02.02.06

SNL TASK LEADER: Langkopf ORG/MS/CF0#: 6146/1087/CF055-06

SMO PROJECT LEAD: Herrera SAMPLE SHIP DATE: 10/26/2005

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
608878	GEL	148808		11/28/2005	X	X	X	X
608880	GEL	148808		11/28/2005	X	X	X	X

DATA PACKAGE TAT:		RUSH	X	NORMAL
CORRECTIONS REQUESTED BY/DATE:				
PROBLEM #/DATE CORRECTION RECEIVED:				
CVR COMPLETED BY/DATE:		T. Herrera		11 29 05
FINAL TRANSMITTED TO/DATE:		B. Langkopf		11.29.05
SENT TO VALIDATION BY/DATE:		R. Kavanaugh		11-29-05
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):				
P/u 12/5/05 VALIDATION COMPLETED BY/DATE:		KAL		11-29-05
COPY TO WM BY/DATE:				
CD REQUESTED BY/DATE				
CD RECEIVED BY/DATE		R. Kavanaugh		11/28/2005
TO ERDMS OR RECORDS CENTER BY/DATE:		R. Kavanaugh		12-5-05

COMMENTS:

Sample Findings Summary

Site: Foothills Site 58 **AR/COC:** 608878, 608880 **Data Type:** Inorganic & Rad

	Radiochemistry	15229-37-5 (Bismuth-211)	14109-32-1 (Cadmium-109)	13982-78-0 (Mercury-203)	13994-20-2 (Neptunium-237)	13233-32-4 (Radium-224)	14932-40-2 (Thorium-231)	10045-97-3 (Cesium-137)							
070376-010 5800-GR-040-S		R	R	R	R	R	R								
070378-010 5800-GR-050-S		R	R		R	R									
070380-010 5800-GR-060-S		R	R		R	R	R	R							
070382-010 5800-GR-070-S		R	R		R	R									

ICP metals analysis met QC acceptance criteria. No data will be qualified.

Validated By: Kevin A Lambert **Date:** 11/29/05

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

Date: November 29, 2005

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: Foothills Site 58
AR/COC: 608878 and 608880
SDG: 148808 and 148809
Laboratory: GEL
Project/Task: 7213.02.02.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6010B (ICP metals). No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

The initial and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as follows.

ICP metals:
Nickel and zinc were detected (≥ DL) in one or more of the blanks (ICB, CCB, MB, EB). The associated sample results were detects > 5x the blank concentrations; no data will be qualified as a result. Also, zinc was detected (≥ DL) in one or more of the blanks (ICB, CCB) at negative concentration with absolute value > the DL but < the RL. The associated sample results were detects > 5x the DL; no data will be qualified as a result.

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD met QC acceptance criteria except as follows.

ICP metals:
For the field samples, it should be noted that no LCSD was provided with the SDG. No data will be qualified as a result. Laboratory precision was assessed using the replicate.

Matrix Spike (MS)

The MS met QC acceptance criteria as follows.

ICP metals:
For the field QC samples, no MS was provided with the SDG. Laboratory precision was assessed using the LCS/LCSD. No data will be qualified as a result. Also, for the field samples, it should be noted that an MSD was run with the SDG. Laboratory precision was assessed using the replicate. No data will be qualified as a result.

Replicate

The replicate met QC acceptance criteria except as follows.

ICP metals:
For the field QC samples, no replicate was provided with the SDG. Laboratory precision was assessed using the LCS/LCSD. No data will be qualified as a result.

ICP Serial Dilution

The serial dilution met QC acceptance criteria.

ICP Interference Check Sample (ICS)

The ICS data met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required except as follows.

ICP metals:
Samples 148808-012 and -013 were diluted 2x and sample 148808-014 was diluted 10x for arsenic and zinc due to high concentrations and matrix interferences.

Other QC

No equipment blank (EB), trip blank (TB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

ICP metals:
EBs and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

Date: November 29, 2005

To: File

From: Kevin Lambert

Subject: Radiochemical Data Review and Validation – SNL
Site: Foothills Site 58
AR/COC: 608878 and 608880
SDG: 148808 and 148809
Laboratory: GEL
Project/Task: 7213.02.02.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using HASL300,4.5.2.3 (Gamma Spec). Problems were identified with the data package that result in the qualification of data.

1. Gamma Spec:
   Several gamma spec results were "X" flagged by the laboratory due to interference (refer to Electronic Data Deliverable). The associated sample results that were not qualified "U" (non-detects) by the laboratory and will be qualified "R" (unusable). See Sample Findings Summary.

   The following target analytes had a negative concentration with an absolute value > the MDA. The associated sample result is qualified as noted below.

   Sample 148808-017 Cs-137 will be qualified "R."

Data are acceptable except as noted above and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

The case narrative stated the instruments used were properly calibrated.

Negative Bias

All sample results met negative bias QC acceptance criteria except as noted above in the summary section.

Blanks

No target analytes were detected in the blanks.

Tracer/Carrier Recovery

Not Applicable

Laboratory Control Sample (LCS)

The LCS met QC acceptance criteria.

Matrix Spike (MS)

The MS met QC acceptance criteria.

Replicate

The replicate met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required.

Other QC

No equipment blank (EB), field blank (FB) or field duplicate pair was submitted on the AR/COC(s).

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: Foothills Site 58 Project/Task #: 7213.02.02.06 # of Samples: 20 Matrix: 18 soil, 2 aqueous

AR/COC #: 608875, 608880 Laboratory Sample IDs: 148808-001 to -018

Laboratory: GEL 148809-001 to -002 (EBs)

SDG #: 148808, 148809

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HB)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation					✓				✓	
2. Calibrations					✓				✓	
3. Method Blanks					✓				✓	
4. MS/MSD					✓				NA	
5. Laboratory Control Samples					✓					
6. Replicates					✓				✓	
7. Surrogates										
8. Internal Standards										
9. TCL Compound Identification										
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries									NA	
13. Other QC lab reported Neg Bias					✓				R	

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable
Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: Kevin A. Lambert Date: 11-29-05

Radiochemistry

Site/Project: _____ AR/COC #: 608878, 608880 Laboratory Sample IDs: 148808 ~~-00~~ KAL -015 to -018 Field Samples

Laboratory: _____ SDG #: EPAL 148808, 148809

Methods: EML HASL 300, 4.5.2.3 (G. Spec)

# of Samples: 4 Matrix: Soil Batch #s: 477134

Analyte	QC Element												
	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3													
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240													
Gross Alpha													
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241	✓	✓	NA	✓									
Gamma Spec. Cs-137	✓	✓	↓	✓									
Gamma Spec. Co-60	✓	✓	↓	✓									

Parameter	Method	Typical Tracer	Typical Carrier
Iso-U	Alpha spec.	U-232	NA
Iso-Pu	Alpha spec.	Pu-242	NA
Iso-Th	Alpha spec.	Th-229	NA
Am-241	Alpha spec.	Am-242	NA
Sr-90	Beta	Y ingrowth	NA
Ni-63	Beta	NA	Ni by ICP
Ra-226	Deamination	NA	NA
Ra-226	Alpha spec.	Ba-133 or Ra-225	NA
Ra-228	Gamma spec.	Ba-133	NA

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Comments: For 148808-017

Neg Bias: Cs-137 ~~had~~ KAL was neg w/abs value ≥ MDA and will be qualified "R"

Lab Rejected data not already qualified as ND by lab will be qualified "R"

Reviewed By: Kevin A Lambert Date: 11-29-05

Field samples

Inorganic Metals

KAL

Site/Project: _____ AR/COC #: 608878, 608880 Laboratory Sample IDs: ~~148808~~ 148808-001 to -014

Laboratory: _____ SDG #: 148808, 148809

Methods: EPA6010B (ICP metals)

# of Samples: ~~KAL 14~~ Matrix: soil Batch #s: 475940

CAS # / Analyte	QC Element																			
	TAL	ICV	CCV	ICB	CCB	Method Blanks * KAL	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD ** KAL	Equip. Blanks	5x Field Blanks KAL	5x DL	
7429-90-5 Al																				
~~7440-39-3 Ba~~																				
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	12	✓			
~~7440-43-9 Cd~~																				
7440-70-2 Ca																				
~~7440-47-3 Cr~~																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	0.171J #	✓			✓	✓	✓	✓	✓	✓	—	✓	0.855		
7440-09-7 K																				
~~7440-22-4 Ag~~																				
7440-23-5 Na																				
7440-62-2 V						***														
7440-66-6 Zn	✓	✓	✓	✓	-0.00285J	✓	✓			✓	✓	✓	✓	✓	✓	2	0.0072	** 0.036	0.010	
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓			
~~7782-49-2 Se~~																				
~~7440-38-2 As~~	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	12	✓			
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x (sample mass (g) / sample vol. (ml)) x (1000 ml / 1 liter)] / Dilution Factor = µg/l

Comments: ** applies to 148808-007 to -014
* applies to 148808-001 to -006
*** applies to 148808-007 to -011

Reviewed By: Kevin A Lambert Date: 11-29-05

Inorganic Metals

Site/Project: _____ AR/COC #: 608878, 608880 Laboratory Sample IDs: 148809-001*, -002** (EBs) Field QC

Laboratory: _____ SDG #: 148808, 148809

Methods: EPA 6010B (ICP metals)

# of Samples: 2 Matrix: aqueous Batch #s: 475943

CAS # / Analyte	QC Element																		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓					
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓					
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓					
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓					
7782-49-2 Se																				
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓					
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments: * applies to 148808-001 to -006 ** applies to 148808-007 to -014

Reviewed By: Kevin A Lambert Date: 11-29-05

Contract Verification Review (CVR)

Project Leader Langkopf | Project Name Foothills Site 58 | Case No. 7213_02.02.06

AR/COC No. 608878, 608880 | Analytical Lab GEL | SDG No. 148808

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided: PQL and MDL (or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	Nickel detected in Metals Method Blank
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Zinc detected in EB 070389-007/148809002
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry a) Instrument run logs provided	X		

ARCOC: 608878, 608880

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes (No)

Based on the review, this data package is complete. (Yes) No

If no, provide: nonconformance report or correction request number _____ and date correction request was submitted_____

Reviewed by: _____ Date: 11/29/05 Closed by: _____ Date: _____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 608878

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-26-05	Project/Task No.: 7213.02.02.06 ✓	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	56565	SMO Authorization: Cy Letter Sent	-Send preliminary/copy report to:
Project Name:	SWMU 58 ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.	CFO55-06 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To:Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154

Reference LOV(available at SMO) 148808

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 070370-006 ✓	58FFC-BH-001-060-S	60	58	102405/1030	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	001
✓ 070371-006 ✓	58FFC-BH-001-070-S	70	58	102405/1050	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	002
✓ 070371-015 ✓	58FFC-BH-001-070-SD	70	58	102405/1050	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,Lead,& Nickel	003
✓ 070372-006 ✓	58FFC-BH-001-080-S	80	58	102405/1112	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	004
✓ 070373-006 ✓	58FFC-BH-001-090-S	90	58	102405/1122	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nickel	005
✓ 070374-006 ✓	58FFC-BH-001-100-S	100	58	102405/1205	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,Lead,& Nicke	006
✓ 070375-006 ✓	58FFC-GR-FF-001-EB	0	58	102405/1140	DIW	P	500 ml	HNO3	G	EB	Arsenic,Beryllium,Lead,& Nickel	148809-001

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy) 10/27/05
Entered by: RK
QC inits. LH

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272

Abnormal Conditions on Receipt

Lab Use

Return Samples By:

	Name	Signature	Init.	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	William Gibson	WG	Weston/6146/284-5232/239-7367
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

*Please list as separate report.

1.Relinquished by	William Gibson	Org. 6146	Date 10/26/05	Time 0915	4.Relinquished by	Org.	Date	Time
1. Received by	[illegible]	Org. 6146	Date 10/26/05	Time 0915	4. Received by	Org.	Date	Time
2.Relinquished by	[illegible]	Org. 6146	Date 10/26/05	Time 1700	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 608880

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	10-26-05	Project/Task No.: 7213.02.02.06	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	56565	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	SWMU 58	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.	CFO55-06	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area				
Building	Room			Reference LOV(available at SMO) 148908	

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070376-007	5800-GR-040-S	40	58	102505/1302	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,and Zinc	007
070376-010	5800-GR-040-S	40	58	102505/1302	soil	P	250 ml	None	G	SA	Gamma Spec	015
070377-007	5800-GR-045-S	45	58	102505/1318	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,and Zinc	008
070377-016	5800-GR-045-SD	45	58	102505/1318	soil	P	250 ml	None	G	DU	Arsenic,Beryllium,and Zinc	009
070378-007	5800-GR-050-S	50	58	102505/1329	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,and Zinc	010
070378-010	5800-GR-050-S	50	58	102505/1329	soil	P	250 ml	None	G	SA	Gamma Spec	016
070379-007	5800-GR-055-S	55	58	102505/1332	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,and Zinc	011
070380-007	5800-GR-060-S	60	58	102505/1350	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,and Zinc	012
070380-010	5800-GR-060-S	60	58	102505/1350	soil	P	250 ml	None	G	SA	Gamma Spec	017
070381-007	5800-GR-065-S	65	58	102505/1420	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,and Zinc	013
070382-007	5800-GR-070-S	70	58	102505/1526	soil	P	250 ml	None	G	SA	Arsenic,Beryllium,and Zinc	014

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking Smo Use

Date Entered(mm/dd/yy) 10/27/05

Entered by: RC QC Inits. LH

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☑ Yes ☐ No

*Send report to:

Brenda Langkopf/Org 6146/MS1087/505-284-3272

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	William J. Gibson	WJG	Weston/6146/284-5232/23907367
	Gilbert Quintana	Gilbert Quintana	GQ	Shaw/6146/284-3309/238-9417
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090

1.Relinquished by	William J. Gibson	Org. 6146	Date 10/26/05	Time 0915	4.Relinquished by		Org.	Date	Time
1. Received by	Gilbert Quintana	Org. 6146	Date 10/26/05	Time 1945	4. Received by		Org.	Date	Time
2.Relinquished by	Gilbert Quintana	Org. 6146	Date 10/26/05	Time 1700	5.Relinquished by		Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 608880

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf	Project/Task No.:	7213.02.02.06
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

148808 Lab use

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
070382-010	5800-GR-070-S	70	58	102505/1526	soil	P	250 ml	None	G	SA	Gamma Spec	018
070389-007	5800-GR-EB	0	58	102505/1544	DIW	P	500 ml	HNO3	C	EB	Arsenic,Beryllium,and Zinc	148809-002

Abnormal Conditions on Receipt

LAB USE

Recipient Initials_____

Feature 58OO Bedrock Sample
AR/COC 609332

RECORDS CENTER CODE: ER/1332/58/DAT

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: Foothills Site 58 PROJECT/TASK: 7213_02.02.06

SNL TASK LEADER: Langkopf ORG/MS/CF0#: 6146/1087/CF055-06

SMO PROJECT LEAD: Herrera SAMPLE SHIP DATE: 1/9/2006

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
609332	GEL	153327	1/18/2006	1/24/2006	X	X	X	X

DATA PACKAGE TAT:	X	RUSH		NORMAL
CORRECTIONS REQUESTED BY/DATE:				
PROBLEM #/DATE CORRECTION RECEIVED:				
CVR COMPLETED BY/DATE:		L. Herrera		01.24.06
FINAL TRANSMITTED TO/DATE:		B. Langkopf.		01.24.06
SENT TO VALIDATION BY/DATE:		R. Kavanaugh		01-26-06
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):				
P/u 1/31/06 VALIDATION COMPLETED BY/DATE:		D. Schwent		01-26-06
COPY TO WM BY/DATE:				
CD REQUESTED BY/DATE				
CD RECEIVED BY/DATE		R. Kavanaugh		1/24/2006
TO ERDMS OR RECORDS CENTER BY/DATE:		R Kavanaugh		01-31-06

COMMENTS:

Sample Findings Summary

Site: Foothills Site 58 **AR/COC:** 609332 **Inorg**

Sample ID	Method/CAS Number (Analysis/Analyte)															
	EPA6010B (ICP):	7440-36-0 (Sb)	7782-49-2 (Se)	7440-39-3 (Ba)	EPA6020 (ICP-MS):	EPA7471A (CVAA):	EPA9056 (Fluoride)									
073785-009 5800-GR-071-S		UJ,A2	UJ,A2	J,A2	All Acceptance criteria met. No sample data will be qualified.	All Acceptance criteria met. No sample data will be qualified.	All Acceptance criteria met. No sample data will be qualified.									

Validated By: David Schwent

Mr. David Schwent

Date: 01/26/06

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum

DATE: January 26, 2006

TO: File

FROM: David Schwent

SUBJECT: Inorganic Data Review and Validation - SNL
Site: Foothills Site 58
AR/COC: 609332
SDG: 153327
Laboratory: GEL
Project/Task: 7213.02.02.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6010B (ICP); EPA6020 (ICP-MS); EPA7471A (CVAA); and EPA9056 (fluoride). Problems were identified with the data package that result in the qualification of data.

ICP Analysis:

MS/MSD: For Sb, the MS percent recovery (%R) (69%) and the MSD %R (63%) were <75% but >30%. The associated result of Sample 153327-001 was a non-detect (ND) and should be qualified "UJ,A2."

MS/MSD: For Se, the MS %R (65%) and the MSD %R (66%) were <75% but >30%. The associated result of Sample 153327-001 was a ND and should be qualified "UJ,A2."

MS/MSD: For Ba, the MSD %R (139%) was >125%. The associated result of Sample 153327-001 was a detect and should be qualified "J,A2."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

ICP Analysis: No target analytes were detected in the blanks, except the following. V was detected in the method blank (MB) at a concentration < the reporting limit (RL) and Fe was detected in the continuing calibration blanks (CCBs) at concentrations < the RL. However, all associated sample results were >5X the MB concentration or >5X the highest CCB concentration and will not be qualified.

All Other Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All Analyses: All LCS QC acceptance criteria were met. No LCSD analyses were performed. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

ICP Analysis: All MS/MSD QC acceptance criteria were met, except as noted in the summary section.

ICP-MS/CVAA Analyses: All MS QC acceptance criteria were met.

Fluoride Analysis: All MS QC acceptance criteria were met, except the following. The MS and MSD %Rs of fluoride (72% and 73%) were <75% but >30%. However, the %Rs were < the QC acceptance limit by only 3% or less. Therefore, based on professional judgment, no sample will be qualified as a result.

Replicates

All Analyses: All replicate QC acceptance criteria were met.

ICP Serial Dilution

Fluoride Analysis: No serial dilution analysis was required by this method.

All Other Analyses: All serial dilution QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

ICP Analysis: All ICS AB QC acceptance criteria were met.

All Other Analyses: No ICS analyses were required for these methods.

Detection Limits/Dilutions

ICP Analysis: All detection limits were properly reported. Sample 153327-001 was diluted 20X for Cd, Fe, and Ag and was diluted 10X for all other target analytes due to the nature of the matrix.

ICP-MS Analysis: All detection limits were properly reported. Sample 153327-001 was diluted 2X for Au due to the nature of the matrix.

All Other Analyses: All detection limits were properly reported. No samples required dilution.

Other QC

All Analyses: No field duplicates (FDs), field blanks (FBs), or equipment blanks (EBs) were submitted on the ARCOCs.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: SNL/Foothills Site 58 Project/Task #: 7213.02.02.06 # of Samples: 1 Matrix: Soil

AR/COC #: 609332 Laboratory Sample IDs: 153327-001.

Laboratory: GEL

SDG #: 153327

QC Element	Analysis									
	Organics				Inorganics				RAD	Other general chem.
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation					✓		✓			✓
2. Calibrations					↓		↓			↓
3. Method Blanks					↓					
4. MS/MSD					J, UJ, A2					
5. Laboratory Control Samples					✓					
6. Replicates					↓		↓			
7. Surrogates										
8. Internal Standards										
9. TCL Compound Identification										
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					↓					
12. Carrier/Chemical Tracer Recoveries										
13. Other QC							NA			

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: David Schwartz Date: 1-26-06

Inorganic Metals

Site/Project: SNL/Foothills Site 58 AR/COC #: 609332 Laboratory Sample IDs: 153327-001

Laboratory: GEL SDG #: 153327

Methods: EPA 6010B (ICP); 6020 (ICP-MS); and 7471A (CVAA).

# of Samples: 1 Matrix: Soil Batch #s: 493414; 493441; 493359.

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB	CCB (µg/L)	Method Blanks (mg/Kg)	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	NA	NA		
7440-39-3 Ba	✓										139									
7440-41-7 Be	✓										✓									
7440-43-9 Cd	✓																			
7440-70-2 Ca	✓																			
7440-47-3 Cr	✓																			
7440-48-4 Co	✓																			
7440-50-8 Cu	✓				✓															
7439-89-6 Fe	✓				35.52															
7439-95-4 Mg	✓				✓															
7439-96-5 Mn	✓																			
7440-02-0 Ni	✓																			
7440-09-7 K	✓																			
7440-22-4 Ag	✓																			
7440-23-5 Na	✓					✓														
7440-62-2 V	✓					0.218														
7440-66-6 Zn	✓					✓														
Au	✓																			
7439-92-1 Pb	✓									✓	✓									
7782-49-2 Se	✓									65 ✓	66 ✓									
7440-38-2 As	✓									69	63									
7440-36-0 Sb	✓																			
7440-28-0 Tl	✓	↓	↓	↓	↓	↓	↓	↓	↓	✓	✓	↓	↓	↓	↓	↓	↓	↓		
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	NA	NA	NA		
Cyanide CN																				

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments:

Reviewed By: David Schmit Date: 1-26-06

General Chemistry

Site/Project: SNL/Foothills Site 58 AR/COC #: 609332 Laboratory Sample IDs: 153327-001

Laboratory: GEL SDG #: 153327

Methods: EPA 9056 (IC - Fluoride).

# of Samples: 1 Matrix: Soil Batch #s: 493522.

CAS #	Analyte	QC Element																		
		TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS *	MSD *	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks	
16984-48-8	Fluoride	✓	✓	✓	✓	✓	✓	✓	NA	NA	72	73	✓	✓	NA	NA	NA	NA	NA	

Comments: * QEL QC limits → 72-105%; Client limits 75-125%.

Reviewed By: David Schwant Date: 1-26-06

RECORDS CENTER CODE: ER/1332/58/DAT

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: Foothills Site 58
PROJECT/TASK: 7213_02.02.06
SNL TASK LEADER: Langkopf
ORG/MS/CF0#: 6146/1087/CF055-06
SMO PROJECT LEAD: Herrera
SAMPLE SHIP DATE: 1/9/2006

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
609332	GEL	153327	1/18/2006	1/24/2006	X	X	X	X

DATA PACKAGE TAT:	X	RUSH		NORMAL
CORRECTIONS REQUESTED BY/DATE:				
PROBLEM #/DATE CORRECTION RECEIVED:				
CVR COMPLETED BY/DATE:		L. Herrera		01.24.06
FINAL TRANSMITTED TO/DATE:		B. Langkopf.		01.24.06
SENT TO VALIDATION BY/DATE:		R. Kavanaugh		01-26-06
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):				
VALIDATION COMPLETED BY/DATE:		D. Schwent		01-26-06
COPY TO WM BY/DATE:				
CD REQUESTED BY/DATE				
CD RECEIVED BY/DATE		R. Kavanaugh		1/24/2006
TO ERDMS OR RECORDS CENTER BY/DATE:				

COMMENTS:

Contract Verification Review (CVR)

Project Leader Langkopf Project Name Site 58 Case No. 7213_02.02.06

AR/COC No. 609332 Analytical Lab GEL SDG No. 153327

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met		X	Missed TAT by one day		
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met		X	MS recovery failed for Antimony and Selenium; Fluoride MS recovery failed
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	Zinc detected in method blank
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	N/A		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)	N/A		
a) 12-hour tune check provided			
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082)	N/A		
a) Initial calibration provided			
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)	X		
a) Initial calibration provided			
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry	N/A		
a) Instrument run logs provided			

Contract Verification Review (Concluded)

5.0 Problem Resolution
Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes (No)

Based on the review, this data package is complete. (Yes) No

If no, provide: nonconformance report or correction request number _____ and date correction request was submitted_____

Reviewed by: [signature] Date: 01/24/06 Closed by:_____Date:_____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab

Batch No. 1/14

SMO Use

AR/COC 609332

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	1/9/06	Project/Task No.:	7213.02.02.06 ✓
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	590388	SMO Authorization:	✓
Project Name:	SWMU 58 ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No.	CF055-06 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		
Location	Tech Area				
Building	Room				

☐ **Waste Characterization**
-Send preliminary/copy report to:

☐ **Released by COC No.:**_____

☑ **Validation Required**

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Reference LOV(available at SMO) 153327

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
073785-009	5800-GR-071-S	71	58	010506/1231	soil	G	250	None	G	SA	TAL Metals+Au+F	

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☑ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: WFN ☐ **Negotiated TAT**

Sample Tracking Smo Use
Date Entered(mm/dd/yy) 01/10/06
Entered by: RK

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
QC inits. WFN
***Send report to:**
Brenda Langkopf/Org 6146/MS1087/505-284-3272

Crush all sample rock fragments in sample container to sand-size or smaller particles and mix throughly before analyzing, thanks!
Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Mike Sanders	Mike Sanders	MS	Gram/6146/284-2478

1.Relinquished by	William Gibson	Org.	6146	Date	1/9/06	Time	1115	4.Relinquished by	Org.	Date	Time
1. Received by	Mike Sanders	Org.	6146	Date	1/9/06	Time	1115	4. Received by	Org.	Date	Time
2.Relinquished by	Mike Sanders	Org.	6146	Date	1/9/06	Time	1300	5.Relinquished by	Org.	Date	Time
2. Received by		Org.		Date		Time		5. Received by	Org.	Date	Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org.	Date	Time

ANNEX C
SWMUs 8 and 58
Calculation of the Upper Confidence Limits of Mean Concentrations

CALCULATION OF THE UPPER CONFIDENCE LIMITS OF MEAN CONCENTRATIONS

For conservatism, Sandia National Laboratories/New Mexico uses the maximum concentration of the COCs for initial risk calculation. If the maximum concentrations produce risk above NMED guidelines, conservatism with this approach is evaluated and, if appropriate, a more realistic approach is applied. When the site has been adequately characterized, an estimate of the mean concentration of the COCs is more representative of actual site conditions. The NMED has proposed the use of the 95, 97.5, or 99% UCL of the mean (depending upon the variants of the data set) to represent average concentrations at a site (NMED December 2000). The UCL is calculated according to NMED guidance (Tharp June 2002) using the U.S. Environmental Protection Agency ProUCL program (EPA April 2002). Attached are the outputs from that program and the calculated UCLs used in the risk analysis.

ATTACHMENT

SWMUs 8 and 58 Combination Area

Combined Data - Human Health		
Summary Statistics for	Arsenic	
Number of Samples	360	
Minimum	0.01	
Maximum	137	
Mean	6.43	
Median	3.23	
Standard Deviation	12.76	
Variance	162.89	
Coefficient of Variation	1.98	
Skewness	7.02	
Lilliefors Test Statisitic	0.1487474	
Lilliefors 5% Critical Value	0.0466963	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	7.54	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	7.81	
Modified-t	7.58	
95 % Non-parametric UCL		
CLT	7.54	
Jackknife	7.54	
Standard Bootstrap	7.55	
Bootstrap-t	7.97	
Chebyshev (Mean, Std)	9.37	

Combined Data - Human Health		
Summary Statistics for	Barium	
Number of Samples	327	
Minimum	1.53	
Maximum	988	
Mean	132.21	
Median	110	
Standard Deviation	105.73	
Variance	11178	
Coefficient of Variation	0.80	
Skewness	3.01	
Lilliefors Test Statisitic	0.096	
Lilliefors 5% Critical Value	0.049	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	141.86	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	142.87	
Modified-t	142.02	
95 % Non-parametric UCL		
CLT	141.83	
Jackknife	141.86	
Standard Bootstrap	141.91	
Bootstrap-t	143.76	
Chebyshev (Mean, Std)	157.70	

Combined Data - Human Health		
Summary Statistics for	Beryllium	
Number of Samples	360	
Minimum	0.055	
Maximum	79.30	
Mean	1.04	
Median	0.42	
Standard Deviation	5.50	
Variance	30.20	
Coefficient of Variation	5.29	
Skewness	11.58	
Lilliefors Test Statisitic	0.156	
Lilliefors 5% Critical Value	0.047	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	1.52	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.70	
Modified-t	1.55	
95 % Non-parametric UCL		
CLT	1.52	
Jackknife	1.52	
Standard Bootstrap	1.51	
Bootstrap-t	2.19	
Chebyshev (Mean, Std)	2.30	

Combined Data - Human Health		
Summary Statistics for	Cadmium	
Number of Samples	330	
Minimum	0.0025	
Maximum	6.020	
Mean	0.431	
Median	0.172	
Standard Deviation	0.765	
Variance	0.585	
Coefficient of Variation	1.774	
Skewness	4.987	
Lilliefors Test Statisitic	0.137	
Lilliefors 5% Critical Value	0.049	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.501	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	0.513	
Modified-t	0.503	
95 % Non-parametric UCL		
CLT	0.500	
Jackknife	0.501	
Standard Bootstrap	0.499	
Bootstrap-t	0.517	
Chebyshev (Mean, Std)	0.615	

Combined Data - Human Health		
Summary Statistics for	Copper	
Number of Samples	240	
Minimum	1.64	
Maximum	684	
Mean	30.03	
Median	14.60	
Standard Deviation	75.18	
Variance	5652	
Coefficient of Variation	2.50	
Skewness	6.28	
Lilliefors Test Statisitic	0.16	
Lilliefors 5% Critical Value	0.06	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	38.04	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	40.12	
Modified-t	38.37	
95 % Non-parametric UCL		
CLT	38.01	
Jackknife	38.04	
Standard Bootstrap	38.12	
Bootstrap-t	42.10	
Chebyshev (Mean, Std)	51.18	

Combined Data - Human Health		
Summary Statistics for	Lead	
Number of Samples	369	
Minimum	0.0752	
Maximum	15000	
Mean	91.08	
Median	8.20	
Standard Deviation	890.20	
Variance	792464.19	
Coefficient of Variation	9.77	
Skewness	14.17	
Lilliefors Test Statisitic	0.153	
Lilliefors 5% Critical Value	0.046	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	167.496241	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	203.83	
Modified-t	173.19	
95 % Non-parametric UCL		
CLT	167.30	
Jackknife	167.50	
Standard Bootstrap	166.15	
Bootstrap-t	367.60	
Chebyshev (Mean, Std)	293.08	

Combined Data - Human Health		
Summary Statistics for	Nickel	
Number of Samples	360	
Minimum	1.87	
Maximum	3960	
Mean	27.50	
Median	9.48	
Standard Deviation	216.97	
Variance	47078	
Coefficient of Variation	7.89	
Skewness	16.91	
Lilliefors Test Statisitic	0.171	
Lilliefors 5% Critical Value	0.047	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	46.36	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	57.20	
Modified-t	48.06	
95 % Non-parametric UCL		
CLT	46.31	
Jackknife	46.36	
Standard Bootstrap	46.10	
Bootstrap-t	115.48	
Chebyshev (Mean, Std)	77.35	

Combined Data - Human Health		
Summary Statistics for	Selenium	
Number of Samples	330	
Minimum	0.035	
Maximum	79	
Mean	4.207	
Median	0.359	
Standard Deviation	10.18	
Variance	103.55	
Coefficient of Variation	2.419	
Skewness	3.170	
Lilliefors Test Statisitic	0.149	
Lilliefors 5% Critical Value	0.049	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	5.131	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	5.233	
Modified-t	5.147	
95 % Non-parametric UCL		
CLT	5.128	
Jackknife	5.131	
Standard Bootstrap	5.157	
Bootstrap-t	5.312	
Chebyshev (Mean, Std)	6.649	

Combined Data - Human Health		
Summary Statistics for	Silver	
Number of Samples	266	
Minimum	0.0106	
Maximum	60.50	
Mean	1.11	
Median	0.12	
Standard Deviation	6.11	
Variance	37.34	
Coefficient of Variation	5.53	
Skewness	8.49	
Lilliefors Test Statisitic	0.09	
Lilliefors 5% Critical Value	0.05	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	1.72	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.93	
Modified-t	1.76	
95 % Non-parametric UCL		
CLT	1.72	
Jackknife	1.72	
Standard Bootstrap	1.73	
Bootstrap-t	2.46	
Chebyshev (Mean, Std)	2.74	

Combined Data - Human Health				
Summary Statistics for			Benzo(a)pyrene	
Number of Samples			21	
Minimum			0.081	
Maximum			0.235	
Mean			0.09	
Median			0.08	
Standard Deviation			0.03	
Variance			0.00	
Coefficient of Variation			0.37	
Skewness			4.58	
Shapiro-Wilk Test Statisitic			0.254	
Shapiro-Wilk 5% Critical Value			0.908	
Data not Lognormal at 5% Significance Level				
Data not Normal: Try Non-parametric UCL				
95	% UCL (Assuming Normal Data)			
Student's-t			0.10	
95	% UCL (Adjusted for Skewness)			
Adjusted-CLT			0.11	
Modified-t			0.10	
95	% Non-parametric UCL			
CLT			0.10	
Jackknife			0.10	
Standard Bootstrap			0.10	
Bootstrap-t			0.56	
Chebyshev (Mean, Std)			0.12	

Combined Data - Human Health				
Summary Statistics for			RDX	
Number of Samples			41	
Minimum			0.0001	
Maximum			19.9	
Mean			0.55	
Median			0.12	
Standard Deviation			3.10	
Variance			9.59	
Coefficient of Variation			5.58	
Skewness			6.40	
Shapiro-Wilk Test Statisitic			0.799237866	
Shapiro-Wilk 5% Critical Value			0.941	
Data not Lognormal at 5% Significance Level				
Data not Normal: Try Non-parametric UCL				
95	% UCL (Assuming Normal Data)			
Student's-t			1.37	
95	% UCL (Adjusted for Skewness)			
Adjusted-CLT			1.87	
Modified-t			1.45	
95	% Non-parametric UCL			
CLT			1.35	
Jackknife			1.37	
Standard Bootstrap			1.36	
Bootstrap-t			26.31	
Chebyshev (Mean, Std)			2.66	

Combined Data - Human Health		
Summary Statistics for	TNT	
Number of Samples	76	
Minimum	9.50E-05	
Maximum	20	
Mean	0.39	
Median	0.00	
Standard Deviation	2.40	
Variance	5.76	
Coefficient of Variation	6.13	
Skewness	7.67	
Lilliefors Test Statisitic	0.371	
Lilliefors 5% Critical Value	0.102	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	0.850	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	1.103	
Modified-t	0.89	
95 % Non-parametric UCL		
CLT	0.84	
Jackknife	0.85	
Standard Bootstrap	0.83	
Bootstrap-t	4.24	
Chebyshev (Mean, Std)	1.59	

Feature 58FF Fire Brick Area

Pile of Fire Bricks (58FF) - Human Health		
Summary Statistics for	Arsenic	
Number of Samples	124	
Minimum	0.0106	
Maximum	103.0000	
Mean	5.5793	
Median	2.9950	
Standard Deviation	10.0319	
Variance	100.6397	
Coefficient of Variation	1.7981	
Skewness	7.7677	
Lilliefors Test Statisitic	0.241736	
Lilliefors 5% Critical Value	0.079565	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	7.0724	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	7.7327	
Modified-t	7.1772	
95 % Non-parametric UCL		
CLT	7.0612	
Jackknife	7.0724	
Standard Bootstrap	7.0711	
Bootstrap-t	8.5391	
Chebyshev (Mean, Std)	9.5062	

Pile of Fire Bricks (58FF) - Human Health		
Summary Statistics for	Beryllium	
Number of Samples	124	
Minimum	0.139	
Maximum	79.300	
Mean	2.249	
Median	0.497	
Standard Deviation	9.260	
Variance	85.753	
Coefficient of Variation	4.118	
Skewness	6.741	
Lilliefors Test Statisitic	0.226818	
Lilliefors 5% Critical Value	0.079565	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	3.627	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	4.154	
Modified-t	3.711	
95 % Non-parametric UCL		
CLT	3.616	
Jackknife	3.627	
Standard Bootstrap	3.612	
Bootstrap-t	5.969	
Chebyshev (Mean, Std)	5.873	

Pile of Fire Bricks (58FF) - Human Health		
Summary Statistics for	Lead	
Number of Samples	124	
Minimum	1.36	
Maximum	15000	
Mean	182.44	
Median	7.39	
Standard Deviation	1453.84	
Variance	2113639.98	
Coefficient of Variation	7.97	
Skewness	9.35	
Lilliefors Test Statisitic	0.25491784	
Lilliefors 5% Critical Value	0.079565149	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	398.82	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	514.29	
Modified-t	417.09	
95 % Non-parametric UCL		
CLT	397.19	
Jackknife	398.82	
Standard Bootstrap	395.03	
Bootstrap-t	19218.29	
Chebyshev (Mean, Std)	751.53	

Pile of Fire Bricks (58FF) - Human Health		
Summary Statistics for	Nickel	
Number of Samples	125	
Minimum	1.9	
Maximum	3960.0	
Mean	54.8	
Median	10.4	
Standard Deviation	359.7	
Variance	129415.0	
Coefficient of Variation	6.6	
Skewness	10.5	
Lilliefors Test Statisitic	0.2082	
Lilliefors 5% Critical Value	0.079246	
Data not Lognormal at 5% Significance Level		
Data not Normal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t	108.1	
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT	140.1	
Modified-t	113.2	
95 % Non-parametric UCL		
CLT	107.7	
Jackknife	108.1	
Standard Bootstrap	107.1	
Bootstrap-t	897.1	
Chebyshev (Mean, Std)	195.1	

National Nuclear Security Administration
Sandia Site Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400

JAN 19 2007

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Road East, Building 1
Santa Fe, NM 87505

Dear Mr. Bearzi,

On behalf of the Department of Energy (DOE) and Sandia Corporation, DOE is submitting the Response to NMED Notice of Disapproval: Supplemental Response and Proposal for Corrective Action Complete Solid Waste Management Units (SWMU) 8 and 58, Foothills Test Area, March 2006, Sandia National Laboratories, EPA ID No. NM589011518, HWB-SNL-05-013, dated June 2, 2006.

Based upon the field investigation data and corresponding risk assessment, a risk-based determination of Corrective Action Complete without Controls is again recommended for SWMU 8 and 58.

If you have any questions regarding this submittal, please contact me at (505) 845-6036 or Joe Estrada of my staff at (505) 845-5326.

Sincerely,

Kimberly A Davis for

Patty Wagner
Manager

Enclosure

cc w/enclosure:
W. Moats, NMED (via Certified Mail)
L. King, USEPA, Region VI (via Certified Mail)
T. Skibitski, NMED-OB
UNM Zimmerman Library (or other Public Reading Room)

Sandia National Laboratories/New Mexico
Environmental Restoration Project

RESPONSE TO NMED NOTICE OF DISAPPROVAL: SUPPLEMENTAL RESPONSE AND PROPOSAL FOR CORRECTIVE ACTION COMPLETE SOLID WASTE MANAGEMENT UNITS 8 AND 58, FOOTHILLS TEST AREA

December 2006

United States Department of Energy
Sandia Site Office

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

TABLE OF CONTENTS

LIST OF FIGURES iii
LIST OF TABLES vii
LIST OF ANNEXES ix
ACRONYMS AND ABBREVIATIONS xi

1.0 INTRODUCTION 1-1

2.0 FEATURE 58FF 2006 SAMPLING ACTIVITIES AND 1995–2006 LEAD AND NICKEL DATA SUMMARY TABLES AND FIGURES 2-1

3.0 FEATURE 58FF 1995–2006 LEAD AND NICKEL ANALYTICAL RESULTS SUMMARY 3-1

3.1 Lead Results 3-1
3.2 Nickel Results 3-1

4.0 FEATURE 58FF 1995–2006 LEAD AND NICKEL EVALUATION AND CONCLUSIONS 4-1

4.1 Lead Evaluation and Conclusions 4-1
4.2 Nickel Evaluation and Conclusions 4-2

5.0 FEATURE 58FF 2006 SOIL SAMPLING QUALITY ASSURANCE/QUALITY CONTROL SAMPLES AND DATA VALIDATION RESULTS 5-1

5.1 Duplicate Samples 5-1
5.2 Equipment Blank Samples 5-1
5.3 Data Validation 5-1

6.0 SWMU 58, FEATURE 58FF REVISED RISK ASSESSMENT 6-1

6.1 Feature 58FF Revised Human Health Risk Assessment 6-1

6.1.1 Feature 58FF Industrial Scenario 6-2
6.1.2 Feature 58FF Residential Scenario 6-2

6.2 SWMU 8 and 58 Combination Area Revised Risk Assessment 6-3

6.2.1 Combination Area Industrial Scenario 6-3
6.2.2 Combination Area Residential Scenario 6-5

7.0 RECOMMENDATION FOR CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS DETERMINATION 7-1

8.0 REFERENCES 8-1

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LIST OF FIGURES

Figure

2-1 Location and Site Map of SWMUs 8 and 58, and SWMU 58 Feature 58FF..... 2-3

2-2 1995-2006 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area..... 2-5

2-3 Collecting borehole cuttings from the drilling rig cyclone with a plastic bucket during the drilling of Borehole 58FF-GR-BH15, September 14, 2005. View to the northeast. 2-7

2-4 Surface Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations 2-27

2-5 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 2') 2-29

2-6 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 4') 2-31

2-7 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 6') 2-33

2-8 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 8') 2-35

2-9 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 10') 2-37

2-10 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 12') 2-39

2-11 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 14') 2-41

2-12 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 16') 2-43

2-13 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 18') 2-45

2-14 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 20') 2-47

2-15 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 22') 2-49

LIST OF FIGURES (Continued)

Figure

2-16 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 24') 2-51

2-17 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 26') 2-53

2-18 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 28') 2-55

2-19 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 30') 2-57

2-20 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 35') 2-59

2-21 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 40') 2-61

2-22 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 45') 2-63

2-23 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 50') 2-65

2-24 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 60') 2-67

2-25 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 70') 2-69

2-26 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 80') 2-71

2-27 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 90') 2-73

2-28 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Lead Concentrations (Sampling Depth: 100') 2-75

2-29 Surface Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations.....2-77

2-30 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 2').....2-79

LIST OF FIGURES (Continued)

Figure

2-31 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 4').....2-81

2-32 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 6').....2-83

2-33 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 8').....2-85

2-34 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 10').....2-87

2-35 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 12').....2-89

2-36 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 14').....2-91

2-37 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 16').....2-93

2-38 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 18').....2-95

2-39 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 20').....2-97

2-40 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 22').....2-99

2-41 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 24').....2-101

2-42 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 26').....2-103

2-43 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 28').....2-105

2-44 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 30').....2-107

2-45 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 35').....2-109

LIST OF FIGURES (Concluded)

Figure

2-46 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 40').....2-111

2-47 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 45').....2-113

2-48 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 50').....2-115

2-49 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 60').....2-117

2-50 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 70').....2-119

2-51 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 80').....2-121

2-52 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 90').....2-123

2-53 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area, Nickel Concentrations (Sampling Depth: 100')...2-125

LIST OF TABLES

Table

2-1 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH14 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, September 2006 (Off-Site Laboratory) 2-10

2-2 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH15 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, September 2006 (Off-Site Laboratory) 2-11

2-3 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH16 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, September 2006 (Off-Site Laboratory) 2-12

2-4 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH17 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, September 2006 (Off-Site Laboratory) 2-13

2-5 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH18 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, September 2006 (Off-Site Laboratory) 2-14

2-6 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH8 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, October 2005 (Off-Site Laboratory).....2-15

2-7 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH9 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, October 2005 (Off-Site Laboratory).....2-16

2-8 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH10 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, October 2005 (Off-Site Laboratory).....2-17

2-9 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH11 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, October 2005 (Off-Site Laboratory).....2-18

2-10 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH12 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, October 2005 (Off-Site Laboratory).....2-19

2-11 Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH13 at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, October 2005 (Off-Site Laboratory).....2-20

LIST OF TABLES (Concluded)

Table

2-12 Summary of Confirmatory Soil Sampling, Boreholes S58-BH4 and 58FF-GR-FF (Located in the Center of Feature 58FF) at SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, April 1997 and October 2005 (Off-Site Laboratory) 2-21

2-13 Summary of Confirmatory Soil Sampling, Boreholes S58-BH1 and 58FFC-BH-001, SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area, Lead and Nickel Analytical Results, April 1997 and October 2005 (Off-Site Laboratory) 2-22

2-14 Summary of SWMU 58, Feature 58FF RFI Surface Soil Sampling, Lead and Nickel Analytical Results, June 1995 and January 1999 (Off-Site Laboratory) 2-23

2-15 Summary of SWMU 58, Feature 58FF RFI Surface and Subsurface Soil Sampling, Boreholes 58FF-GR-FF, 58FFC-BH-001 through 58FFC-BH-006, and S58-BH1 through S58-BH7, Lead and Nickel Analytical Results, April 1996, August 1996, and April 1997 (Off-Site Laboratory) 2-24

5-1 Summary of the SWMU 58, Feature 58FF Field Duplicate Sample RPD Values for Lead and Nickel Analyses of Confirmatory Soil Samples, September 2006 (Off-Site Laboratory) 5-2

6-1 Risk Assessment Values for Nonradiological COCs, SWMU 58, Feature 58FF, Fire Brick Area (1995–2006 Analytical Data) 6-3

6-2 Risk Assessment Values for Nonradiological COCs, SWMU 8 and 58 Combination Area (1995–2006 Analytical Data) 6-4

LIST OF ANNEXES

Annex

A SWMU 58, Feature 58FF, Fire Brick Area, Soil Sample Data Validation Report, September 2006

B SWMU 58, Feature 58FF, and SWMU 8 and 58 Combination Area, Calculation of the Upper Confidence Limits of Mean Concentrations

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CAC	Corrective Action Complete
COC	constituent of concern
DOE	U.S. Department of Energy
EB	equipment blank
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
GEL	General Engineering Laboratories, Inc.
HI	hazard index
HWB	Hazardous Waste Bureau
kg	kilogram(s)
mg	milligram(s)
NMED	New Mexico Environment Department
RME	reasonable maximum exposure
RPD	relative percent difference
RSI	Request for Supplemental Information
Sandia	Sandia Corporation
SAP	Sampling and Analysis Plan
SNL/NM	Sandia National Laboratories/New Mexico
SWMU	Solid Waste Management Unit
UCL	upper confidence limit

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1.0 INTRODUCTION

From 1995 to 2005, environmental surveys, remedial actions to remove surface debris, and environmental sampling were conducted at Solid Waste Management Units (SWMUs) 8 and 58. The results of the environmental activities performed at the sites were summarized and compiled in the Sandia National Laboratories Environmental Restoration [ER] Project Corrective Action Complete [CAC] Proposal for SWMUs 8 and 58, submitted to the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) in April 2005 (SNL/NM April 2005). The CAC proposal was reviewed by the NMED, and a Request for Supplemental Information (RSI) letter, addressed to the U.S. Department of Energy (DOE) and Sandia Corporation (Sandia), was received in June 2005 (NMED June 2005). This RSI letter indicated that data gaps remained at the two sites, and that additional surface and subsurface soil sampling were required to define the horizontal and vertical extent of contamination at SWMUs 8 and 58.

Following receipt of the NMED RSI letter in June 2005, a meeting to discuss and clarify the additional sampling needs at these sites was held between Sandia National Laboratories/New Mexico (SNL/NM) ER Project and NMED HWB personnel. Once the sampling issues were clarified, a detailed sampling and analysis plan (SAP) that described the additional sampling to be conducted at the site by SNL/NM was submitted to the NMED in August 2005 (SNL/NM August 2005). The NMED reviewed the SAP and approved the document in a letter dated September 13, 2005 (NMED September 2005). The field sampling described in the SAP was conducted in September and October 2005. The results of this sampling event were summarized and presented in an RSI response report titled “Supplemental Response and Proposal for Corrective Complete, Solid Waste Management Units 8 and 58, Foothills Test Area” (SNL/NM March 2006).

The March 2006 supplemental response was reviewed by NMED HWB personnel, and a “Notice of Disapproval” letter, dated June 2, 2006, was issued to the DOE and Sandia (NMED June 2006). This letter stated in part that:

> Elevated concentrations of lead and nickel at boring 58FF-GR-FF are not defined horizontally or vertically. The U.S. Department of Energy and Sandia Corporation (the permittees) must submit a work plan to the NMED describing what actions are to be taken to determine the nature and extent of soil contamination at feature 58FF. The plan must include the collection of surface soil samples, and the collection of subsurface soil samples to a depth of at least 30 feet below the ground surface. The interval at which subsurface soil samples must be collected shall not exceed 2 feet. All of the soil samples must be analyzed for lead and nickel. (NMED June 2006)

In response to this second NMED letter, another meeting was held between NMED HWB and SNL/NM ER Project personnel on June 23, 2006, to clarify the additional sampling requirements for this site. It was agreed at the meeting that a total of five new boreholes drilled to depths of 30 feet at the site would be sufficient to satisfy NMED concerns about the horizontal or vertical extent of potential lead and nickel contamination at the site. One of the borings was to be located at the center of Feature 58FF, and the other four boreholes were to be offset approximately 10 feet out from, and in directions northwest, northeast, southeast, and southwest from, the center of Feature 58FF. As described in Chapter 2.0, the locations of four of the five boreholes were subsequently adjusted slightly to avoid drilling at locations that were apparently previously disturbed at the site. Samples were to be collected at 2-foot intervals

from the surface to 30 feet below ground surface (bgs) in each borehole and analyzed for lead and nickel.

Following the meeting, a second SAP was written. A copy of the SAP was informally provided to the NMED for review on July 26, 2006, and approximately one week later NMED representatives indicated verbally that it was acceptable. The SAP was then officially submitted to the NMED for review on August 9, 2006, and officially approved by the NMED on October 26, 2006 (NMED October 2006).

This report presents the results of additional surface and subsurface lead and nickel soil sampling that was conducted at SWMU 58, Feature 58FF, Fire Brick Area, in September 2006. For completeness, lead and nickel analytical results for all soil samples that have been collected from Feature 58FF from 1995 through 2006 are also included in this document. The 1995–2006 lead and nickel sampling results are evaluated and discussed, and the risk assessments that were previously completed for both Feature 58FF, and SWMUs 8 and 58 as a whole (presented in the March 2006 RSI response report) have been revised to incorporate the 2006 data.

2.0 FEATURE 58FF 2006 SAMPLING ACTIVITIES AND 1995–2006 LEAD AND NICKEL DATA SUMMARY TABLES AND FIGURES

The locations of SWMUs 8 and 58 and Feature 58FF are shown in Figure 2-1. On September 13 and 14, 2006, surface and subsurface soil samples were collected from five new 30-foot-deep boreholes. The locations of the five 2006 boreholes (58-GR-BH14 through 58-GR-BH18), as well as all previous 1995 through 2005 sampling locations and boreholes are shown in Figure 2-2.

As shown in Figure 2-2, borehole 58-GR-BH14 was drilled at a location 2 feet west of the center of Feature 58FF to avoid redrilling and sampling at previous boring locations in the center of Feature 58FF. In addition, three of the offset borings (58-FR-BH16, -BH17, and -BH18) were also adjusted to locations that were 8 feet (instead of the original plan of 10 feet) out from the center of Feature 58FF to avoid drilling and sampling at locations that appeared to have been disturbed and impacted by previous drilling and sampling activities at the site.

As a first step, approximately 6 inches of surface soil from the area where the five 2006 boreholes would be drilled was removed in order to ensure that only undisturbed native soil would be collected for samples. The surface soil samples at the five locations were then collected with a hand trowel. Following collection of the surface samples, a dual-tube percussion drilling rig was used to drill and sample each of the Feature 58FF boreholes at the designated subsurface sample depth intervals, from 2 to 30 feet bgs (Figure 2-3). Material encountered in all five of the relatively closely spaced boreholes consisted of a mixture of silt, sand, and fine to coarse gravel, with variable amounts and sizes of rock fragments. A transition from relatively fine-grained silts and sands to material containing a higher percentage of rocks and cobbles was noted starting at approximately 25 feet bgs in each borehole.

The sample collection technique utilized for the 2005 borehole samples was also used in 2006. At each boring location, soil samples were collected from all 2-foot depth intervals from 2 to 30 feet bgs. At each boring location, soil for each sample was obtained by drilling an approximate 12-inch-long interval that started at the top of the designated sampling depth. The soil from each run was collected by holding a decontaminated, 5-gallon, plastic bucket beneath the bottom of the sample cuttings cyclone and collecting all of the material that was returned to the surface while the 12-inch borehole interval was drilled (Figure 2-3). The collected material was thoroughly mixed with a hand trowel and then passed through a decontaminated brass screen with 2-millimeter openings to remove rocks and other oversized material from the sample. The soil that passed through the screen was thoroughly mixed again with a decontaminated hand trowel, and an aliquot of this blended soil was transferred into sample containers and submitted for laboratory analysis. All samples were documented and handled in accordance with applicable SNL/NM operating procedures. After completion of sample collection activities, all five of the boreholes were backfilled to the surface with bentonite grout.

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434000
435000
436000
437000

1460000
1459000
1458000
1457000
1456000

6110
6340
6030
5960
5930
6020
5890
5900

SWMU
58

SWMU
8

58FF

Legend

Feature 58FF
(symbol shows radial sampling pattern at this site)

10 Foot Contour

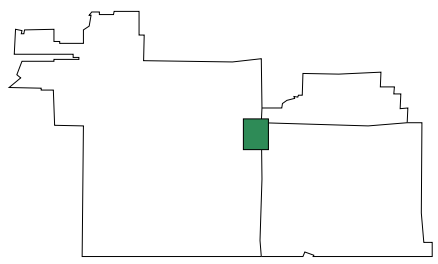
KAFB Boundary

Unpaved Road

SWMUs 8 and 58 Boundary

0 500 1000
Scale in Feet

0 120 240
Scale in Meters



Sandia National Laboratories, New Mexico
Environmental Operations Geographic Information System

Figure 2-1
Location and Site Map of SWMUs 8 and 58, and SWMU 58 Feature 58FF

Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone
1927 North American Horizontal Datum, 1929 North American Vertical Datum

Unclassified	MAPID= dh070050	SNL GIS ORG. 6757
D.Helfrich	dh050424.aml	11/21/06

840857.02140000 B3

Mapid=070051 11/21/06 SNL EGIS ORG. 6765 DHelfrich dh070051.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
58FF-GR-BH14
GR-105
GR-107
GR-106
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
1457100
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line

Figure 2-2
1995 - 2006 Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B4

Figure 2-3
Collecting borehole cuttings from the drilling rig cyclone with a plastic bucket during the drilling of Borehole 58FF-GR-BH15, September 14, 2005. View to the northeast.

All of the September 2006 samples collected from the five boreholes were analyzed for lead and nickel by General Engineering Laboratories, Inc. (GEL). The lead and nickel analytical results for the 2006 borehole samples are presented in Tables 2-1 through 2-5. For completeness and convenience, lead and nickel analytical results for all additional previous surface and subsurface soil samples that have been collected from Feature 58FF from 1995 through 2005 and that were presented in the April 2005 CAC proposal (SNL/NM April 2005) and the March 2006 supplemental response (SNL/NM March 2006) are again presented in Tables 2-6 through 2-15.

A total of 283 primary and duplicate surface and subsurface soil samples have been collected at Feature 58FF between 1995 and 2006 and analyzed for lead and nickel. Figures 2-4 through 2-53 are depth layer maps that have been prepared to graphically illustrate the horizontal and vertical distribution of lead and nickel concentrations (presented in Tables 2-1 through 2-15) detected in all surface and subsurface samples collected to date from Feature 58FF.

Lead and nickel concentration layer maps were prepared for surface samples and subsurface samples for each 2-foot depth from 2 to 30 feet bgs, every 5 feet from 35 to 50 feet bgs, and every 10 feet from 60 to 100 feet bgs. In order to limit the number of 2-foot layer maps, a portion of the 1- to 30-foot depth samples that were collected at odd-numbered sampling depths were rounded up or down 1 foot for inclusion in the even-numbered, 2-foot layer maps. The same base map was used for all of the depth layer figures. This base map shows all surface and subsurface sampling locations at Feature 58FF from 1996 through 2006. However, at each depth, samples were collected from only a portion of the total sampling locations shown in the figures. Therefore, for each layer, locations at which lead and nickel samples were collected are circled. A single green circle denotes locations where the lead or nickel concentration was less than or equal to the background value, and a double red circle shows locations where above-background lead or nickel concentrations were detected. For these locations, the lead or nickel concentration that was detected is also shown in the figure.

Table 2-1
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH14 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
September 2006
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
610763	58FF-GR-BH14-0-S	0	6.16	10.8
610763	58FF-GR-BH14-2-S	2	7.22	13.9
610763	58FF-GR-BH14-4-S	4	4.83	10.7
610763	58FF-GR-BH14-6-S	6	4.97	9.14
610763	58FF-GR-BH14-6-SD	6	5.17	9.6
610763	58FF-GR-BH14-8-S	8	6.47	10.1
610763	58FF-GR-BH14-10-S	10	11.8	11.8
610763	58FF-GR-BH14-12-S	12	10.9	13.7
610763	58FF-GR-BH14-14-S	14	7.18	11.1
610763	58FF-GR-BH14-16-S	16	8.02	10.2
610763	58FF-GR-BH14-18-S	18	7.18	8.65
610763	58FF-GR-BH14-20-S	20	6.67	10.7
610763	58FF-GR-BH14-20-SD	20	8.85	12.3
610763	58FF-GR-BH14-22-S	22	6.83	10.4
610763	58FF-GR-BH14-24-S	24	8.31	**20**
610763	58FF-GR-BH14-26-S	26	6.31	**27.8**
610763	58FF-GR-BH14-28-S	28	6.58	**37**
610763	58FF-GR-BH14-30-S	30	10.9	**44.8**
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-2
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH15 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
September 2006
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
610764	58FF-GR-BH15-0-S	0	9.19	11.8
610764	58FF-GR-BH15-2-S	2	12.3	13.7
610764	58FF-GR-BH15-4-S	4	8.63	12.3
610764	58FF-GR-BH15-6-S	6	6.67	10.1
610764	58FF-GR-BH15-8-S	8	5.49	7.32
610764	58FF-GR-BH15-10-S	10	7.39	9.5
610764	58FF-GR-BH15-12-S	12	7.83	10.8
610764	58FF-GR-BH15-14-S	14	6.82	11.5
610764	58FF-GR-BH15-16-S	16	18.7	13.5
610764	58FF-GR-BH15-18-S	18	5.4	9.08
610764	58FF-GR-BH15-20-S	20	6.58	9.67
610764	58FF-GR-BH15-22-S	22	7.35	10.2
610764	58FF-GR-BH15-24-S	24	11.8	**17.1**
610764	58FF-GR-BH15-26-S	26	9.61	**29.4**
610764	58FF-GR-BH15-28-S	28	8.64	**28**
610764	58FF-GR-BH15-28-SD	28	8.78	**39.2**
610764	58FF-GR-BH15-30-S	30	8.51	**30.9**
Background Concentration—Canyons Area[c]			18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)				
610764	58FF-GR-BH15-EB	NA	ND (0.0025)	ND (0.001 J)

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-3
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH16 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
September 2006
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
610765	58FF-GR-BH16-0-S	0	**23**	11.9
610765	58FF-GR-BH16-2-S	2	5.81	11.7
610765	58FF-GR-BH16-4-S	4	6.12	9.75
610765	58FF-GR-BH16-6-S	6	5.83	8.66
610765	58FF-GR-BH16-8-S	8	5.54	8.41
610765	58FF-GR-BH16-10-S	10	6.19	9.84
610765	58FF-GR-BH16-12-S	12	7.29	14.1
610765	58FF-GR-BH16-14-S	14	7.64	13.5
610765	58FF-GR-BH16-16-S	16	9.31	14.8
610765	58FF-GR-BH16-18-S	18	6.81	8.35
610765	58FF-GR-BH16-20-S	20	7.53	8.32
610765	58FF-GR-BH16-22-S	22	8.31	12.9
610765	58FF-GR-BH16-24-S	24	8.5	**18.4**
610765	58FF-GR-BH16-26-S	26	9.89	**31.4**
610765	58FF-GR-BH16-28-S	28	6.89	**28.9**
610765	58FF-GR-BH16-28-SD	28	6.98	**29.4**
610765	58FF-GR-BH16-30-S	30	9.22	**25.1**
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-4
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH17 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
September 2006
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
610766	58FF-GR-BH17-0-S	0	8.61	14.1
610766	58FF-GR-BH17-2-S	2	ND (1.22)	10.6
610766	58FF-GR-BH17-4-S	4	2.57 J (4.78)	13.2
610766	58FF-GR-BH17-6-S	6	3.22 J (4.93)	11
610766	58FF-GR-BH17-8-S	8	3.85 J (4.87)	11.1
610766	58FF-GR-BH17-10-S	10	4.84 J (4.96)	13.2
610766	58FF-GR-BH17-12-S	12	4.44 J (4.92)	13.2
610766	58FF-GR-BH17-14-S	14	3.04 J (4.97)	11.5
610766	58FF-GR-BH17-16-S	16	7.04	10.6
610766	58FF-GR-BH17-18-S	18	5.89	9.16
610766	58FF-GR-BH17-20-S	20	4.61 J (4.95)	8.52
610766	58FF-GR-BH17-22-S	22	5.24	12.8
610766	58FF-GR-BH17-24-S	24	7.53	**17.9**
610766	58FF-GR-BH17-26-S	26	5.6	**22.4**
610766	58FF-GR-BH17-28-S	28	12.1	**76.5**
610766	58FF-GR-BH17-28-SD	28	10.4	**64.3**
610766	58FF-GR-BH17-30-S	30	11.7	**36.3**
Background Concentration—Canyons Area[c]			18.9	16.6
Quality Assurance/Quality Control Samples (mg/L)				
610766	58FF-GR-BH16-EB	NA	ND (0.0025)	ND (0.001 J)

Note: Values in **bold** exceed background soil concentration.

[a]EPA November 1986.

[b]Analysis Request/Chain-of-Custody record.

[c]Garcia November 1998.

BH = Borehole.
EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
NA = Not applicable.
ND ( ) = Not detected above the MDL, shown in parentheses.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-5
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH18 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
September 2006
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
610767	58FF-GR-BH18-0-S	0	8.1	12.1
610767	58FF-GR-BH18-2-S	2	6.13	9.24
610767	58FF-GR-BH18-4-S	4	4.83	7.55
610767	58FF-GR-BH18-6-S	6	5.15	8.15
610767	58FF-GR-BH18-8-S	8	5.72	9.93
610767	58FF-GR-BH18-10-S	10	5.61	9.39
610767	58FF-GR-BH18-10-SD	10	5.35	7.58
610767	58FF-GR-BH18-12-S	12	6.23	9.73
610767	58FF-GR-BH18-14-S	14	7.6	11.2
610767	58FF-GR-BH18-16-S	16	6.96	8.86
610767	58FF-GR-BH18-18-S	18	6.59	7.78
610767	58FF-GR-BH18-20-S	20	8.66	8.69
610767	58FF-GR-BH18-22-S	22	8.71	10.4
610767	58FF-GR-BH18-24-S	24	10.6	11.7
610767	58FF-GR-BH18-26-S	26	6.89	**19.6**
610767	58FF-GR-BH18-28-S	28	10.8	**26.8**
610767	58FF-GR-BH18-30-S	30	7.81	**22.7**
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-6
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH8 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
608871	58FF-GR-BH8-005-S	5	8.83 J (9.9)	7.37
608871	58FF-GR-BH8-010-S	10	8.98	11.3
608871	58FF-GR-BH8-010-SD	10	7.98	11.3
608871	58FF-GR-BH8-015-S	15	7.54	10.4
608871	58FF-GR-BH8-020-S	20	7.57	8.7
608871	58FF-GR-BH8-025-S	25	15.2	**16.9**
608871	58FF-GR-BH8-030-S	30	6.08	**56.6**
608871	58FF-GR-BH8-035-S	35	7.58	**24.2**
608871	58FF-GR-BH8-040-S	40	7.21	**25.6**
608871	58FF-GR-BH8-045-S	45	10.8	**24**
608871	58FF-GR-BH8-050-S	50	8.53	**22.2**
608871	58FF-GR-BH8-060-S	60	12.2	**23**
608871	58FF-GR-BH8-070-S	70	7.91	16.6
608871	58FF-GR-BH8-080-S	80	8.54	16.5
608871	58FF-GR-BH8-090-S	90	7.51	10.4
608871	58FF-GR-BH8-100-S	100	11.2	14.8
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-7
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH9 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
608872	58FF-GR-BH9-005-S	5	6.71	9.53
608872	58FF-GR-BH9-010-S	10	8.16	10.1
608872	58FF-GR-BH9-010-SD	10	9.06 J	11.3
608872	58FF-GR-BH9-015-S	15	7.6 J	10.4
608872	58FF-GR-BH9-020-S	20	6.51	9.18
608872	58FF-GR-BH9-025-S	25	9.31 J	**17.8**
608872	58FF-GR-BH9-030-S	30	6.59	**59.1**
608872	58FF-GR-BH9-035-S	35	7.08	**23.6**
608872	58FF-GR-BH9-040-S	40	7.34	**24.9**
608872	58FF-GR-BH9-045-S	45	7.62	**21.5**
608872	58FF-GR-BH9-050-S	50	8.52	**23.8**
608872	58FF-GR-BH9-060-S	60	7.24	**18.2**
608872	58FF-GR-BH9-070-S	70	7.99	**20.4**
608872	58FF-GR-BH9-080-S	80	11.8	15
608872	58FF-GR-BH9-090-S	90	7.01	**21.7**
608872	58FF-GR-BH9-100-S	100	6.94	13.7
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was quantified as an estimated value.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-8
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH10 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
608873	58FF-GR-BH10-005-S	5	6.39	9.72
608873	58FF-GR-BH10-010-S	10	8.17 J	11.7
608873	58FF-GR-BH10-010-SD	10	8.08 J	12.1
608873	58FF-GR-BH10-015-S	15	7.03	8.84
608873	58FF-GR-BH10-020-S	20	7.73	10.6
608873	58FF-GR-BH10-025-S	25	13	12.6
608873	58FF-GR-BH10-030-S	30	8.84	**38.8**
608873	58FF-GR-BH10-035-S	35	8.18	**18.4**
608873	58FF-GR-BH10-040-S	40	6.75	15.7
608873	58FF-GR-BH10-045-S	45	6.34	**25.5**
608873	58FF-GR-BH10-050-S	50	8.55	**25.8**
608873	58FF-GR-BH10-060-S	60	8.81	**24.8**
608873	58FF-GR-BH10-070-S	70	8.45	**23.4**
608873	58FF-GR-BH10-080-S	80	6.57	12.4
608873	58FF-GR-BH10-090-S	90	13	**40.1**
608873	58FF-GR-BH10-100-S	100	7.76	14.1
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was quantified as an estimated value.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-9
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH11 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
608874	58FF-GR-BH11-005-S	5	14.9	10.7
608874	58FF-GR-BH11-010-S	10	12.8	13
608874	58FF-GR-BH11-010-SD	10	10.4	12.9
608874	58FF-GR-BH11-015-S	15	7.19	9.05
608874	58FF-GR-BH11-020-S	20	9.11	10.4
608874	58FF-GR-BH11-025-S	25	8.39	12.4
608874	58FF-GR-BH11-030-S	30	8.78	**32**
608874	58FF-GR-BH11-035-S	35	11.7	**28.8**
608874	58FF-GR-BH11-040-S	40	5.83	**32.4**
608874	58FF-GR-BH11-045-S	45	7.62	**22.5**
608874	58FF-GR-BH11-050-S	50	9.2	**38.3**
608874	58FF-GR-BH11-060-S	60	10.2	**28.6**
608874	58FF-GR-BH11-070-S	70	13.1	**55.4**
608874	58FF-GR-BH11-080-S	80	11.5	**18**
608874	58FF-GR-BH11-090-S	90	14.2	**19.6**
608874	58FF-GR-BH11-100-S	100	11.4	10.6
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-10
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH12 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
608875	58FF-GR-BH12-005-S	5	5.44	8.69
608875	58FF-GR-BH12-010-S	10	7.32	10.8
608875	58FF-GR-BH12-010-SD	10	7.09	10.4
608875	58FF-GR-BH12-015-S	15	8.51	10.6
608875	58FF-GR-BH12-020-S	20	9.39	7.49
608875	58FF-GR-BH12-025-S	25	8.2	**16.9**
608875	58FF-GR-BH12-030-S	30	6.65	**36.2**
608875	58FF-GR-BH12-035-S	35	7.66	**43.4**
608875	58FF-GR-BH12-040-S	40	8.03	**25.5**
608875	58FF-GR-BH12-045-S	45	7.04	**21.3**
608875	58FF-GR-BH12-050-S	50	8.04	**21.1**
608875	58FF-GR-BH12-060-S	60	5.82	13.9
608875	58FF-GR-BH12-070-S	70	6.45	12.2
608875	58FF-GR-BH12-080-S	80	9.25	11.9
608875	58FF-GR-BH12-090-S	90	14.8	**21.5**
608875	58FF-GR-BH12-100-S	100	10.8	**17.7**
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-11
Summary of Confirmatory Soil Sampling, Borehole 58FF-GR-BH13 at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 3050/6010B)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
608876	58FF-GR-BH13-005-S	5	8.92	11.5
608876	58FF-GR-BH13-010-S	10	7.62	11.3
608876	58FF-GR-BH13-010-SD	10	8.28	10.5
608876	58FF-GR-BH13-015-S	15	7.49	10.1
608876	58FF-GR-BH13-020-S	20	6.81	7.66
608876	58FF-GR-BH13-025-S	25	10.4	**21.4**
608876	58FF-GR-BH13-030-S	30	11.8	**19.3**
608876	58FF-GR-BH13-035-S	35	9.31	**32.4**
608876	58FF-GR-BH13-040-S	40	9.12	**29.4**
608876	58FF-GR-BH13-045-S	45	7.36	**19.3**
608876	58FF-GR-BH13-050-S	50	8.23	**30.6**
608876	58FF-GR-BH13-060-S	60	12.6	**73.7**
608876	58FF-GR-BH13-070-S	70	11.4	**33.3**
608876	58FF-GR-BH13-080-S	80	7.98	12.5
608876	58FF-GR-BH13-090-S	90	**19.2**	**24.6**
608876	58FF-GR-BH13-100-S	100	7.13	**21.2**
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-12
Summary of Confirmatory Soil Sampling, Boreholes S58-BH4 and 58FF-GR-FF
(Located in the Center of Feature 58FF) at SWMU 58,
Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
April 1997 and October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010 [1997 samples] and 3050/6010B [2005 samples])[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
April 1997 Soil Samples from Borehole S58-BH4				
05014	S58-BH4-016-010-SA	10	3.24 J	4.33
05014	S58-BH4-017-020-SA	20	3.15 J	3.68
05014	S58-BH4-018-030-SA	30	4.98 J	**22.4**
05014	S58-BH4-019-040-SA	40	6.36 J	**25.4**
05014	S58-BH4-020-050-SA	50	4.61 J	8.8
October 2005 Samples from Borehole 58FF-GR-FF				
608877	58FF-GR-FF-060-S	60	7.57	16.4
608877	58FF-GR-FF-070-S	70	9	**20.8**
608877	58FF-GR-FF-070-SD	70	10.3	**21.3**
608877	58FF-GR-FF-080-S	80	18.4	**32.4**
608877	58FF-GR-FF-090-S	90	8.43	15.7
608877	58FF-GR-FF-100-S	100	7.74	11.1
Background Concentration—Canyons Area[c]			18.9	16.6

Notes: Values in **bold** exceed background soil concentration. As shown in Figure 2-2, Boreholes S58-BH4 and 58FF-GR-FF were both drilled in the center of Feature 58FF. The April 1997 sample results are also shown in Table 2-15.

[a]EPA November 1986.

[b]Analysis Request/Chain-of-Custody record.

[c]Garcia November 1998.

BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SA = Subsurface soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-13
Summary of Confirmatory Soil Sampling, Boreholes S58-BH1 and 58FFC-BH-001
SWMU 58, Feature 58FF, Fire Brick Area, Coyote Canyon Blast Area
Lead and Nickel Analytical Results
April 1997 and October 2005
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010 [1997 samples] and 3050/6010B [2005 samples])[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
April 1997 Soil Samples from Borehole S58-BH1, located 6 ft southeast of Borehole 58FFC-BH-001				
06579	S58-BH1-001-010-SA	10	4.33 J	6.78 J
06579	S58-BH1-002-020-SA	20	2.3 J	1.87 J
06579	S58-BH1-003-030-SA	30	3.72 J	**16.9 J**
06579	S58-BH1-004-040-SA	40	7 J	15.9 J
06579	S58-BH1-005-050-SA	50	7.58 J	16.3 J
October 2005 Samples from Borehole 58FFC-BH-001 Location				
608878	58FFC-BH-001-060-S	60	7.64	**20**
608878	58FFC-BH-001-070-S	70	8.58	**17.6**
608878	58FFC-BH-001-070-SD	70	9.02	**17.3**
608878	58FFC-BH-001-080-S	80	6.81	14.8
608878	58FFC-BH-001-090-S	90	7.45	15.6
608878	58FFC-BH-001-100-S	100	8.17	15.5
Background Concentration—Canyons Area[c]			18.9	16.6

Note: Values in **bold** exceed background soil concentration. Boreholes S58-BH1 and 58FFC-BH-001 are located within 6 feet of each other and are considered to be one sampling location.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J = Analytical result was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
S = Soil sample.
SA = Subsurface soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

Table 2-14
Summary of SWMU 58, Feature 58FF RFI Surface Soil Sampling
Lead and Nickel Analytical Results
June 1995 and January 1999
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
June 1995 Samples				
03861	58-GR-018-0-SS	0–0.5	**20**	13
03861	58-GR-022-0-SS	0–0.5	7.4	8.6
03861	58-GR-026-0-SS	0–0.5	**40**	13
03861	58-GR-030-0-SS	0–0.5	**120**	12
January 1999 Samples				
601330	S58FF-GR-101-0-SS	0–0.5	18.9	9.36
601330	S58FF-GR-102-0-SS	0–0.5	**23.0**	9.52
601330	S58FF-GR-103-0-SS	0–0.5	**23.6**	8.18
601330	S58FF-GR-104-0-SS	0–0.5	**29.2**	7.60
601330	S58FF-GR-105-0-SS	0–0.5	**23.8**	11.6
601330	S58FF-GR-106-0-SS	0–0.5	9.81	9.21
601330	S58FF-GR-102-0-SD[c]	0–0.5	9.99	8.89
601330	S58FF-GR-107-0-SS	0–0.5	18.4	7.50
601330	S58FF-GR-108-0-SS	0–0.5	14.3	9.71
601330	S58FF-GR-109-0-SS	0–0.5	**56.7**	12.0
601330	S58FF-GR-110-0-SS	0–0.5	**19.9**	12.4
601330	S58FF-GR-111-0-SS	0–0.5	**20.3**	8.89
601330	S58FF-GR-112-0-SS	0–0.5	7.40	4.98
601330	S58FF-GR-113-0-SS	0–0.5	1.36	10.0
Background Concentration—Canyons Area[d]			18.9	16.6

Note: Values in **bold** exceed background soil concentration.
[a]EPA November 1986.
[b]Analysis Request/Chain-of-Custody record.
[c]Duplicate of S58FF-GR-106-0-SS.
[d]Garcia November 1998.
BH = Borehole.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
SD = Soil sample duplicate.
SS = Surface soil sample.
SWMU = Solid Waste Management Unit.

Table 2-15
Summary of SWMU 58, Feature 58FF RFI Surface and Subsurface Soil Sampling,
Boreholes 58FF-GR-FF, 58FFC-BH-001 through 58FFC-BH-006, and
S58-BH1 through S58-BH7
Lead and Nickel Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
April 1996 Borehole				
05073	58FF-GR-FF-0.-1.0-SS	0–1.0	**219**	7.09
05073	58FF-GR-FF-0.-1.0-SSD	0–1.0	**5610**	8.38 J
05073	58FF-GR-FF-5.0-6.0-SS	5.0–6.0	**15000**	**19.1 J**
05073	58FF-GR-FF-10.0-11.0-SS	10.0–11.0	11.2	5.41 J
05073	58FF-GR-FF-19.0-20.0-SS	19.0–20.0	**6250**	**546 J**
August 1996 Boreholes				
05706	58FFC-BH-001-5.0-S	4.0–5.0	8.39	6.79 J
05706	58FFC-BH-001-10.0-S	9.0–10.0	6.88	14.2 J
05706	58FFC-BH-001-19.0-S	18.0–19.0	6.95	13.9 J
05706	58FFC-BH-001-24.0-S	23.0–24.0	5.13	**18.3 J**
05706	58FFC-BH-001-29.0-S	28.0–29.0	5.87	**631 J**
05706	58FFC-BH-002-5.0-S	4.0–5.0	**74.8**	**61.1 J**
05706	58FFC-BH-002-10.0-S	9.0–10.0	7.38	9.52 J
05706	58FFC-BH-002-19.0-S	18.0–19.0	6.35	5.69 J
05706	58FFC-BH-002-24.0-S	23.0–24.0	6.36	**25.4 J**
05706	58FFC-BH-002-29.0-S	28.0–29.0	3.15	**33.4 J**
05706	58FFC-BH-003-5.0-S	4.0–5.0	5.31	5.95
05706	58FFC-BH-003-10.0-S	9.0–10.0	6.21	9.33
05706	58FFC-BH-003-19.0-S	18.0–19.0	7.39	9.56
05706	58FFC-BH-003-24.0-S	23.0–24.0	7.19	**20.6 J**
05706	58FFC-BH-003-29.0-S	28.0–29.0	6.21	**3960 J**
05706	58FFC-BH-004-5.0-S	4.0–5.0	5.26	7.09
05706	58FFC-BH-004-10.0-S	9.0–10.0	6.24	**98.5 J**
05706	58FFC-BH-004-19.0-S	18.0–19.0	4.95	6.75
05706	58FFC-BH-004-24.0-S	23.0–24.0	7.8	**19.3 J**
05706	58FFC-BH-004-29.0-S	28.0–29.0	6.24	**24.5 J**
05706	58FFC-BH-005-5.0-S	4.0–5.0	5.96	6.65
05706	58FFC-BH-005-10.0-S	9.0–10.0	5.71	7.18
05706	58FFC-BH-005-19.0-S	18.0–19.0	6.36	9.45
05706	58FFC-BH-005-24.0-S	23.0–24.0	8.44	12.5 J
05706	58FFC-BH-005-24.0-SD	23.0–24.0	6.72	10.1 J
05706	58FFC-BH-006-5.0-S	4.0–5.0	7.39	10.2 J
05706	58FFC-BH-006-10.0-S	9.0–10.0	6.6	14.8 J
05706	58FFC-BH-006-19.0-S	18.0–19.0	9.18	12.2 J
05706	58FFC-BH-006-24.0-S	23.0–24.0	8.71	10.7 J
05706	58FFC-BH-006-29.0-S	28.0–29.0	10	**67.6**
April 1997 Boreholes				
06579	S58-BH1-001-010-SA	10–11.0	4.33 J	6.78 J
06579	S58-BH1-002-020-SA	20–21	2.3 J	1.87 J
06579	S58-BH1-003-030-SA	30–31	3.72 J	**16.9 J**
06579	S58-BH1-004-040-SA	40–41	7 J	15.9 J
06579	S58-BH1-005-050-SA	50–51	7.58 J	16.3 J
06579	S58-BH2-006-010-SA	10.0–11.0	3.61 J	3.84 J
Background Concentration—Canyons Area[c]			18.9	16.6

Refer to footnotes at end of table.

Table 2-15 (Concluded)
Summary of SWMU 58, Feature 58FF RFI Surface and Subsurface Soil Sampling,
Boreholes 58FF-GR-FF, 58FFC-BH-001 through 58FFC-BH-006, and
S58-BH1 through S58-BH7
Lead and Nickel Analytical Results
April 1996, August 1996, and April 1997
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010)[a] (mg/kg)	
Record Number[b]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
April 1997 Boreholes (Continued)				
06579	S58-BH2-007-020-SA	20–21	5.09 J	6.04 J
06579	S58-BH2-036-020-DU[d]	20–21	4.34 J	6.64 J
06579	S58-BH2-008-030-SA	30–31	4.65 J	**44.6 J**
06579	S58-BH2-009-040-SA	40–41	5.78 J	12.2 J
06579	S58-BH2-010-050-SA	50–51	6.74 J	15.1 J
06579	S58-BH3-011-010-SA	10.0–11.0	5.21 J	6.7 J
06579	S58-BH3-012-020-SA	20–21	8.36 J	7.09 J
06579	S58-BH3-012-020-DU	20–21	5.71 J	6.54 J
06579	S58-BH3-013-033-SA	33	6.93 J	**26.3 J**
06579	S58-BH3-014-040-SA	40–41	15 J	**41.2 J**
06579	S58-BH3-015-050-SA	50–51	4.55 J	**27 J**
05014	S58-BH4-016-010-SA	10.0–11.0	3.24 J	4.33
05014	S58-BH4-017-020-SA	20–21	3.15 J	3.68
05014	S58-BH4-018-030-SA	30–31	4.98 J	**22.4**
05014	S58-BH4-019-040-SA	40–41	6.36 J	**25.4**
05014	S58-BH4-020-050-SA	50–51	4.61 J	8.8
06579	S58-BH5-021-010-SA	10.0–11.0	2.98 J	4.67 J
06579	S58-BH5-022-020-SA	20–21	3.81 J	5.13 J
06579	S58-BH5-023-030-SA	30–31	6.6 J	**22.4 J**
06579	S58-BH5-024-044-SA	44–45	6.58 J	14.2 J
06579	S58-BH5-025-050-SA	50–51	10.8 J	**32.3 J**
05014	S58-BH6-026-010-SA	10.0–11.0	5.94 J	7.35
05014	S58-BH6-027-020-SA	20–21	4.19 J	4.54
05014	S58-BH6-028-030-SA	30–31	5.03 J	**27.7**
05014	S58-BH6-029-040-SA	40–41	5.74 J	13.1
05014	S58-BH6-030-050-SA	50–51	6.16 J	11.5
05014	S58-BH7-031-010-SA	10.0–11.0	7.6 J	6.25
05014	S58-BH7-032-020-SA	20–21	6.87 J	6
05014	S58-BH7-033-030-SA	30–31	5.83 J	**16.9**
05014	S58-BH7-034-040-SA	40–41	4.22 J	16.2
05014	S58-BH7-035-045-SA	45	**37.6**	**25.5**
Background Concentration—Canyons Area[c]			18.9	16.6

Notes: Values in **bold** exceed background soil concentration. Sample results from S58-BH1 and S58-BH4 are also shown in Tables 2-13 and 2-12, respectively.

[a]EPA November 1986.

[b]Analysis Request/Chain-of-Custody record.

[c]Garcia November 1998.

[d]S58-BH2-036-020-DU is a duplicate of S58-BH2-007-020-SA.

BH = Borehole.
DU = Duplicate soil sample.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
J = Analytical result was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
RCRA = Resource Conservation and Recovery Act.
RFI = RCRA Facility Investigation.
S = Soil sample.
SA = Subsurface soil sample.
SD = Sample duplicate.
SS = Soil sample.
SSD = Soil sample duplicate.
SWMU = Solid Waste Management Unit.

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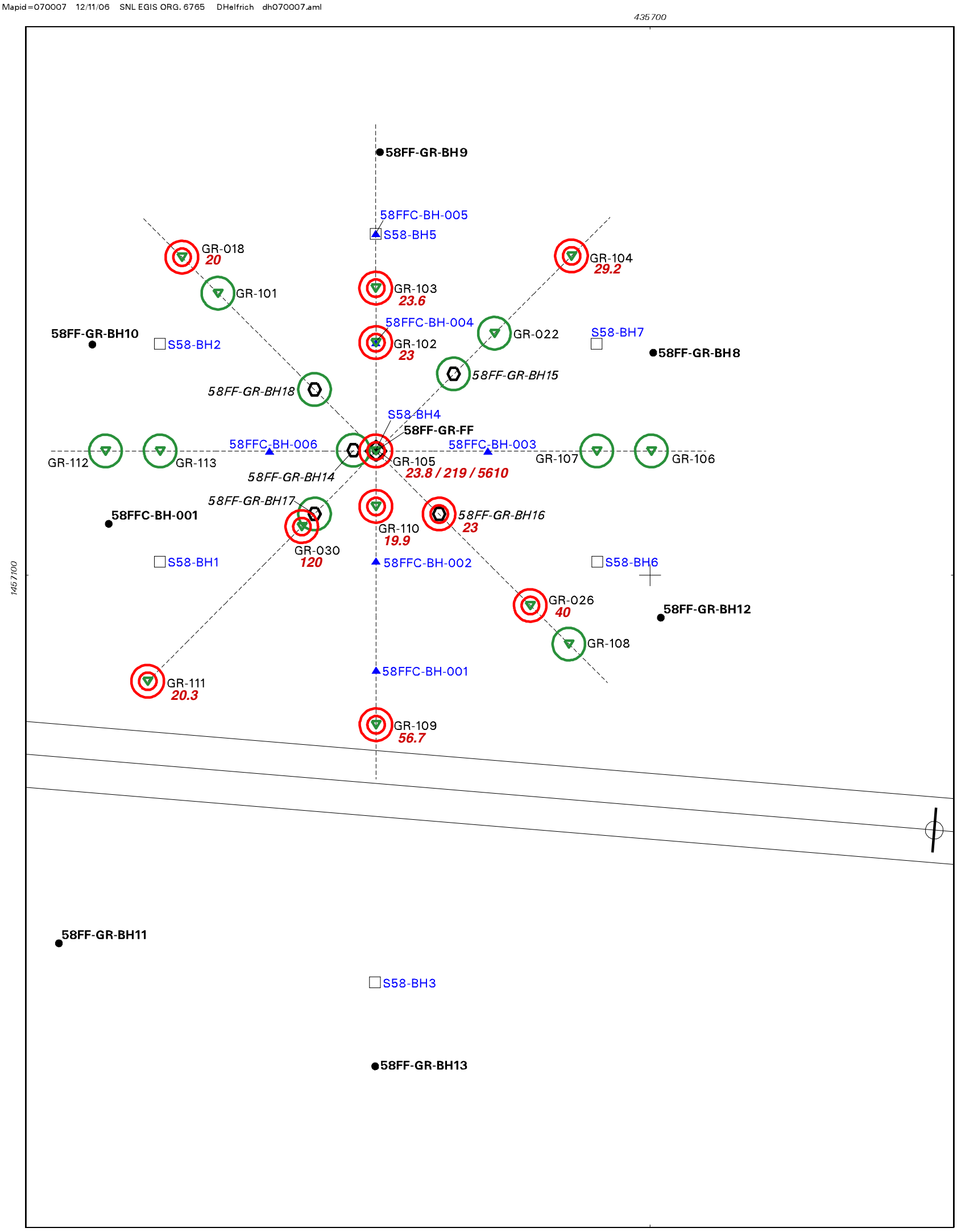
Mapid=070007 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070007.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 56.7 — Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-4
Surface Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Lead Concentrations

0 10 20
Scale in Feet

0 2 4
Scale in Meters

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Environmental Geographic Information System

840857.02140000 B5

Mapid=070008 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070008.aml

435700

58FF-GR-BH9

58FFC-BH-005
S58-BH5

GR-018
GR-101
GR-104
GR-103

58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8

58FF-GR-BH15
58FF-GR-BH18

S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14

58FF-GR-BH17
58FFC-BH-001
GR-110
58FF-GR-BH16
GR-030

1457100

S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109

58FF-GR-BH11
S58-BH3
58FF-GR-BH13

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

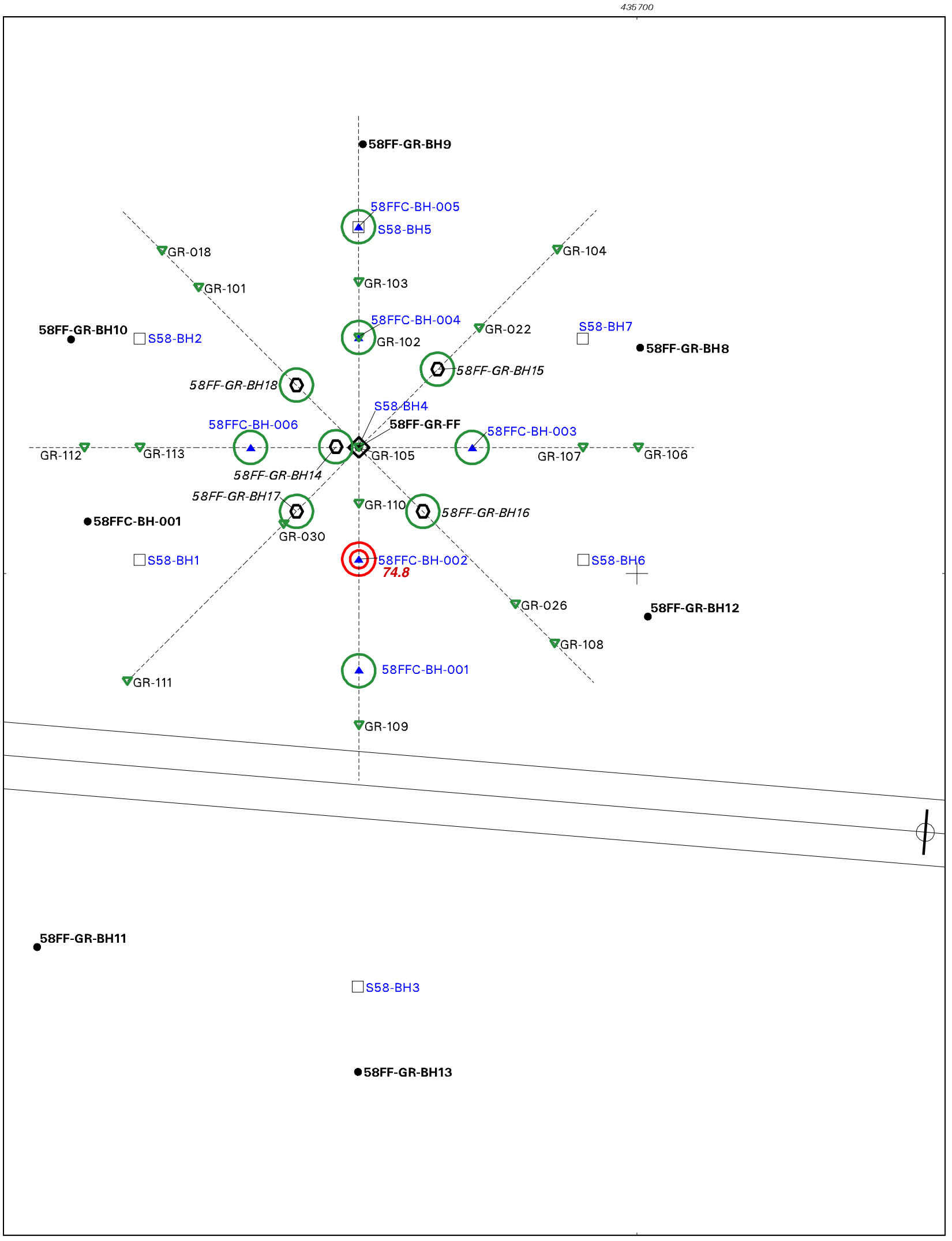
Figure 2-5
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 2')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B6

Mapid=070009 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070009.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 74.8 Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-6
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Lead Concentrations (Sampling Depth: 4')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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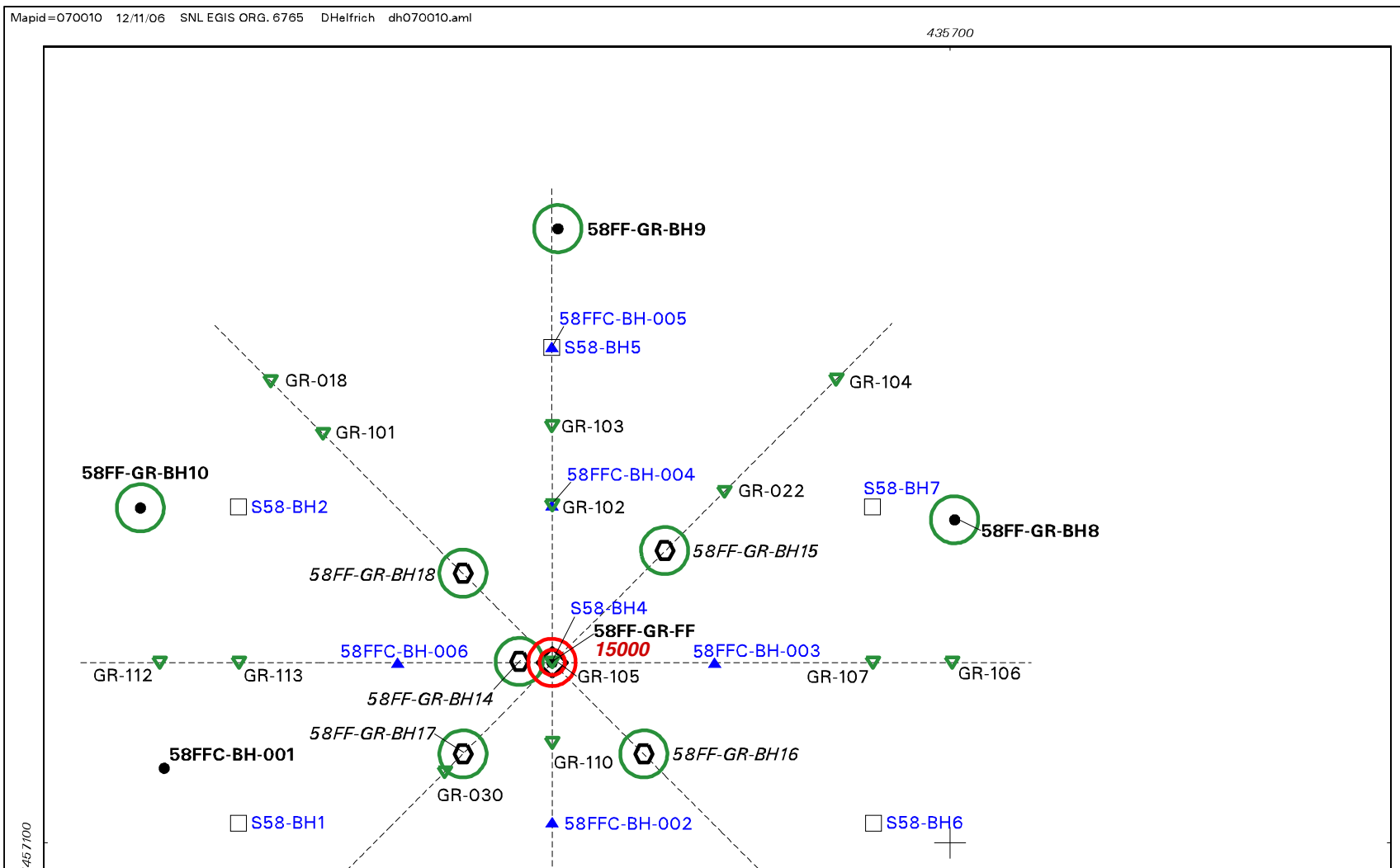
Environmental Geographic Information System

840857.02140000 B7

Mapid=070010 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070010.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 15000 Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

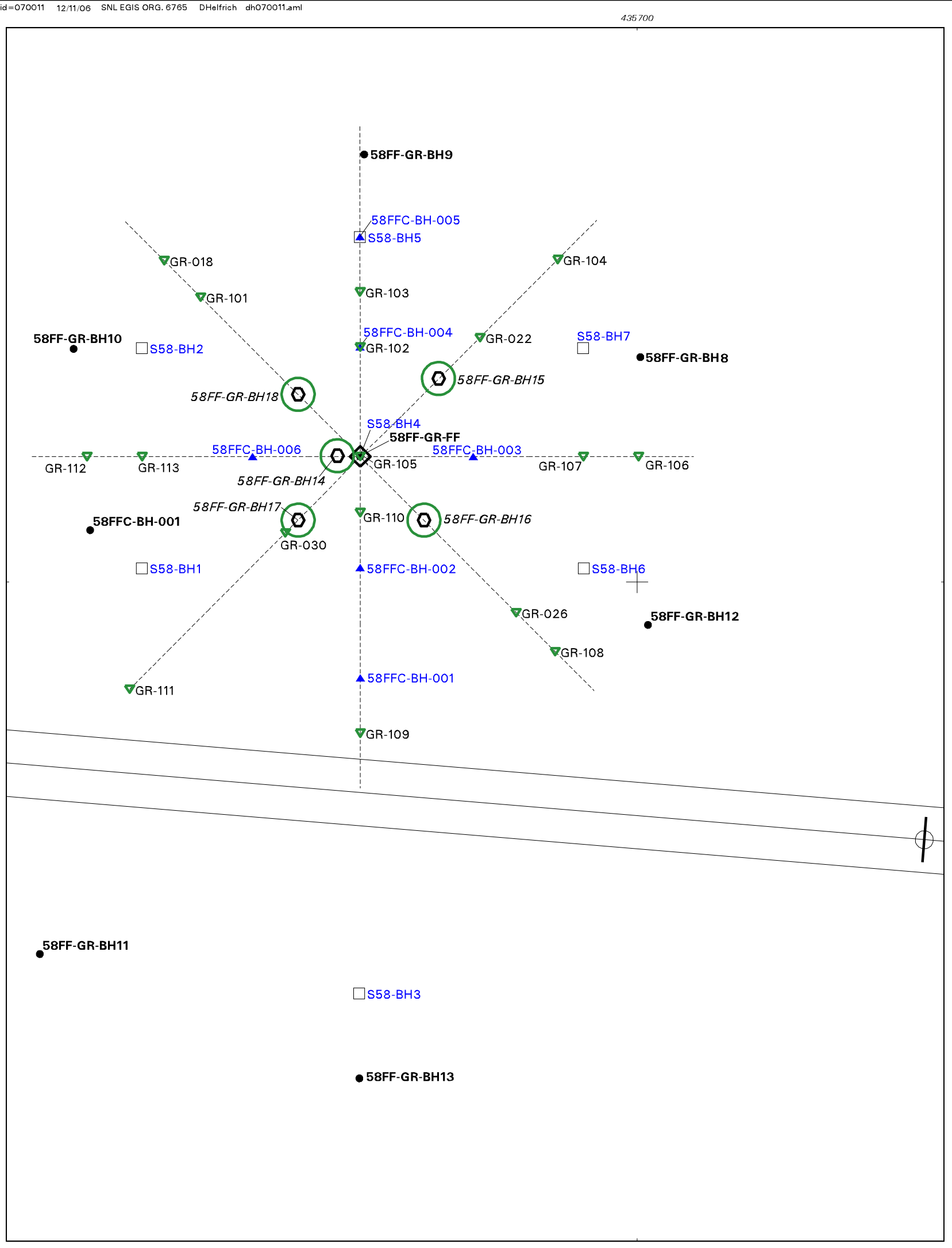
Figure 2-7
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 6')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B8

Mapid=070011 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070011.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-8
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Lead Concentrations (Sampling Depth: 8')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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Environmental Geographic Information System

840857.02140000 B9

Mapid=070012 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070012.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FFC-BH-006
58FF-GR-FF
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-9
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 10')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B10

Mapid=070013 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070013.aml

435700

58FF-GR-BH9

58FFC-BH-005
S58-BH5

GR-018
GR-104
GR-101
GR-103

58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8

58FF-GR-BH15
58FF-GR-BH18

S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14

58FF-GR-BH17
58FFC-BH-001
GR-110
58FF-GR-BH16
GR-030

S58-BH1
58FFC-BH-002
S58-BH6

GR-026
58FF-GR-BH12
GR-108

58FFC-BH-001
GR-111

GR-109

145 7100

145 7100

58FF-GR-BH11

S58-BH3

58FF-GR-BH13

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-10
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Lead Concentrations (Sampling Depth: 12')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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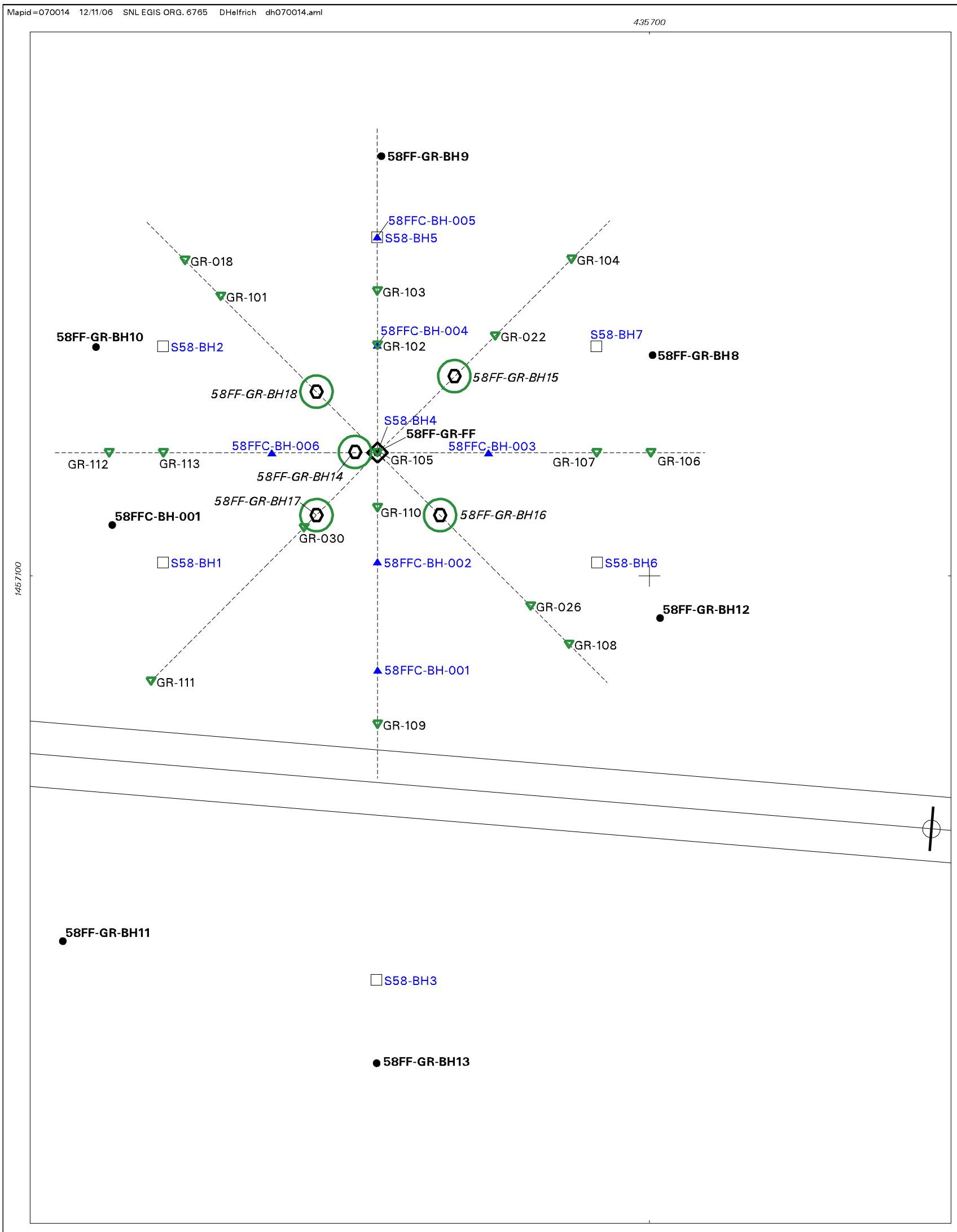
Environmental Geographic Information System

840857.02140000 B11

Mapid=070014 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070014.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-11
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Lead Concentrations (Sampling Depth: 14')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B12

Mapid=070015 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070015.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH7
S58-BH2
GR-102
GR-022
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
58FF-GR-BH16
58FFC-BH-001
GR-110
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-12
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Lead Concentrations (Sampling Depth: 16')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B13

Mapid=070016 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070016.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH2
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FFC-BH-006
58FF-GR-FF
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FFC-BH-003
58FF-GR-BH17
58FF-GR-BH16
58FFC-BH-001
GR-110
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-13
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 18')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B14

Mapid=070017 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070017.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
6250
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
58FF-GR-BH16
58FFC-BH-001
GR-110
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 6250 — Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

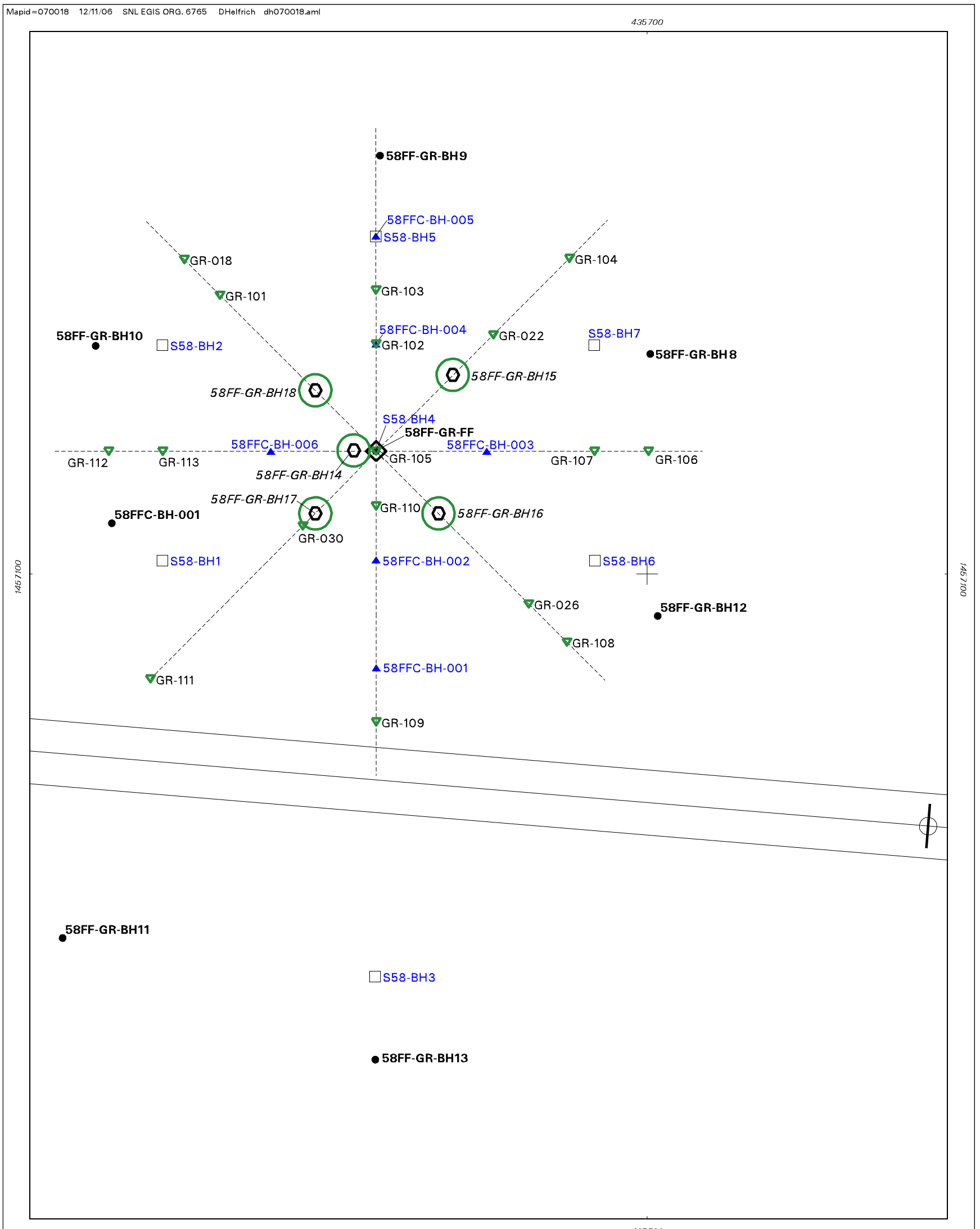
Figure 2-14
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 20')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B15

Mapid=070018 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070018.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-15
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 22')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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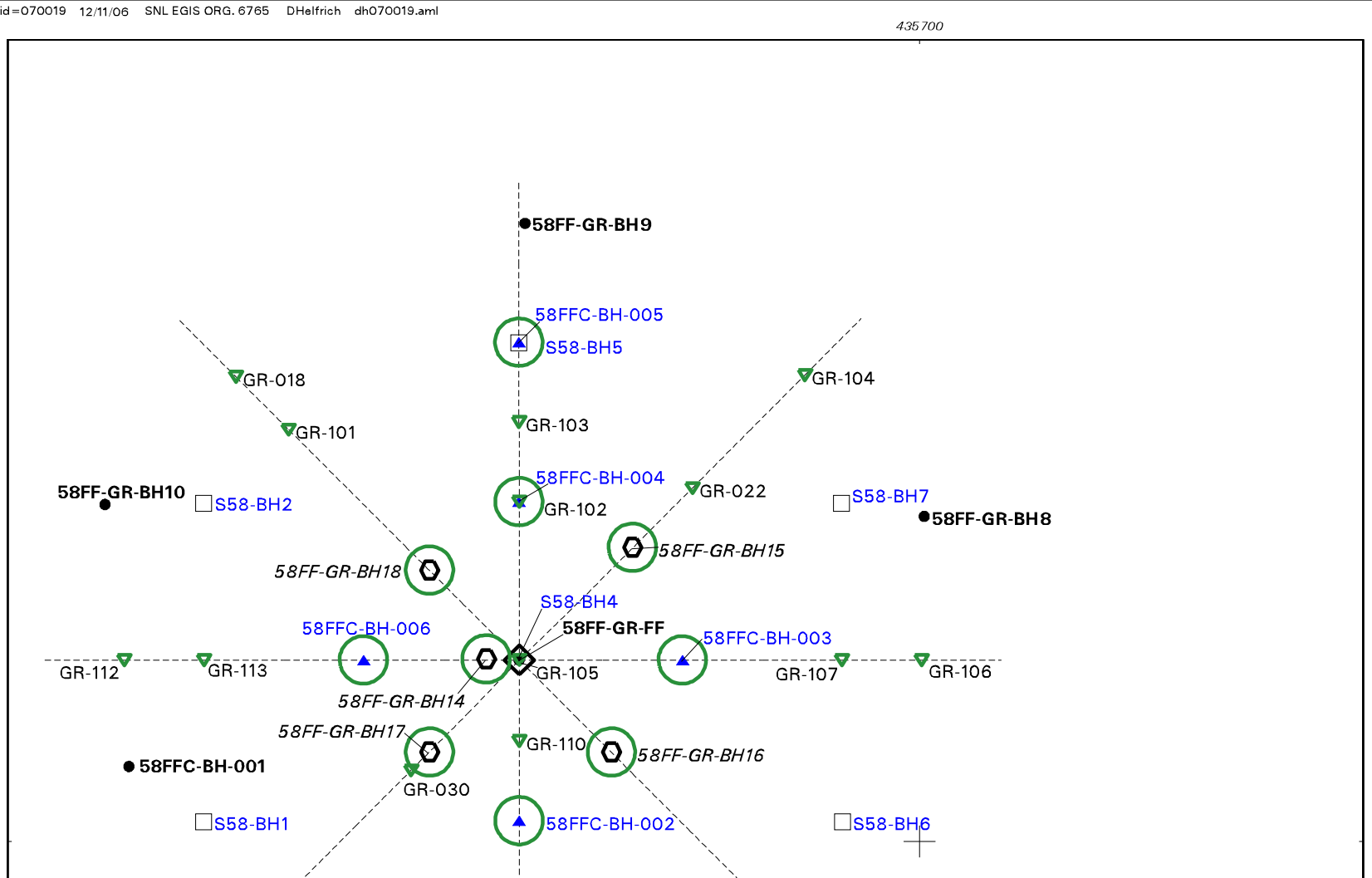
Environmental Geographic Information System

840857.02140000 B16

Mapid=070019 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070019.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-16
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 24')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B17

Mapid=070020 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070020.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH7
S58-BH2
GR-102
GR-022
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

145700

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-17
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 26')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B18

Mapid=070032 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070032.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-022
S58-BH7
GR-102
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FFC-BH-006
58FF-GR-FF
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109

1457100

58FF-GR-BH11
S58-BH3
58FF-GR-BH13

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-18
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 28')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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840857.02140000 B19

Mapid=070033 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070033.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
GR-111
58FFC-BH-001
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-19
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 30')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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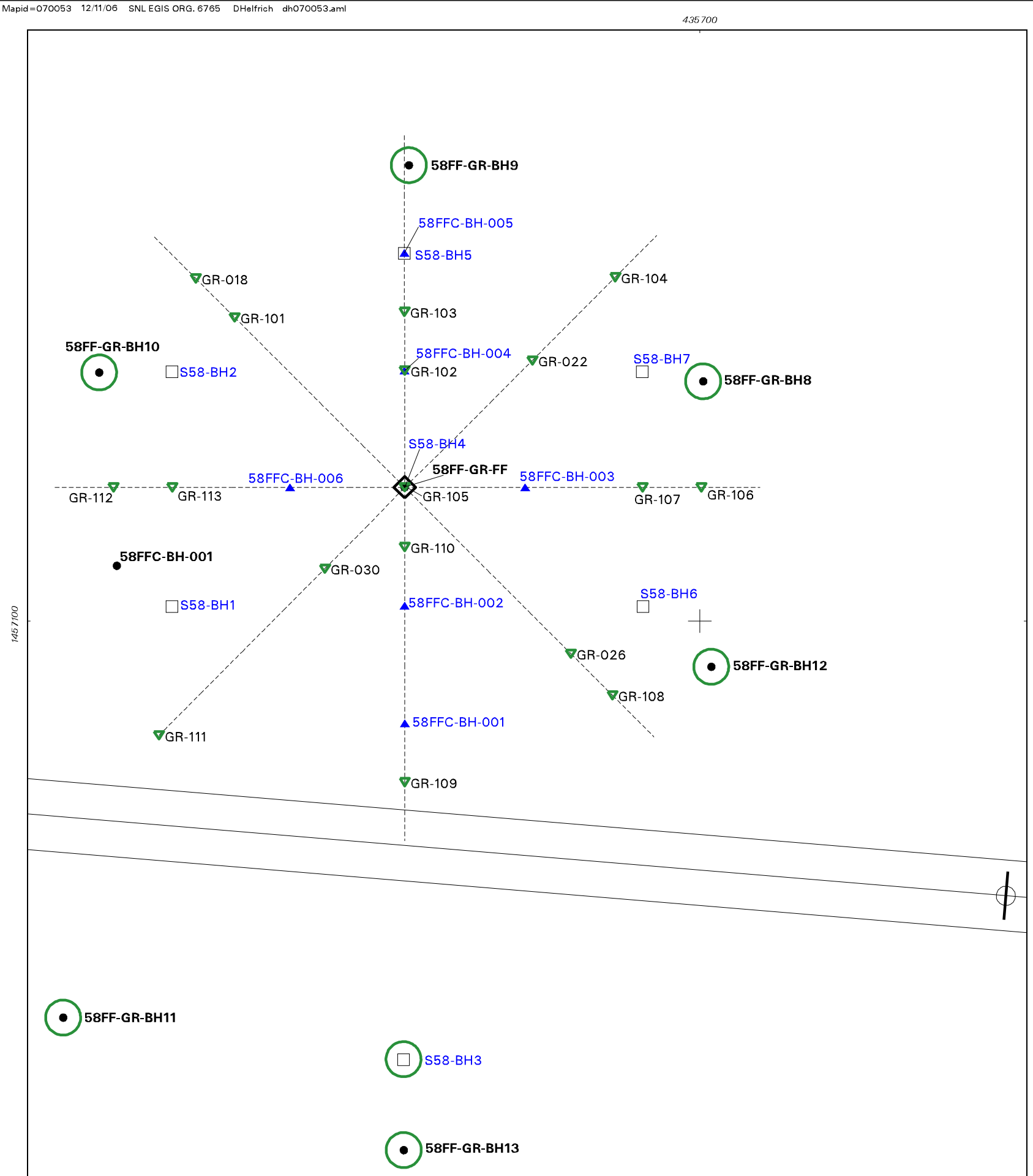
Environmental Geographic Information System

840857.02140000 B20

Mapid=070053 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070053.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

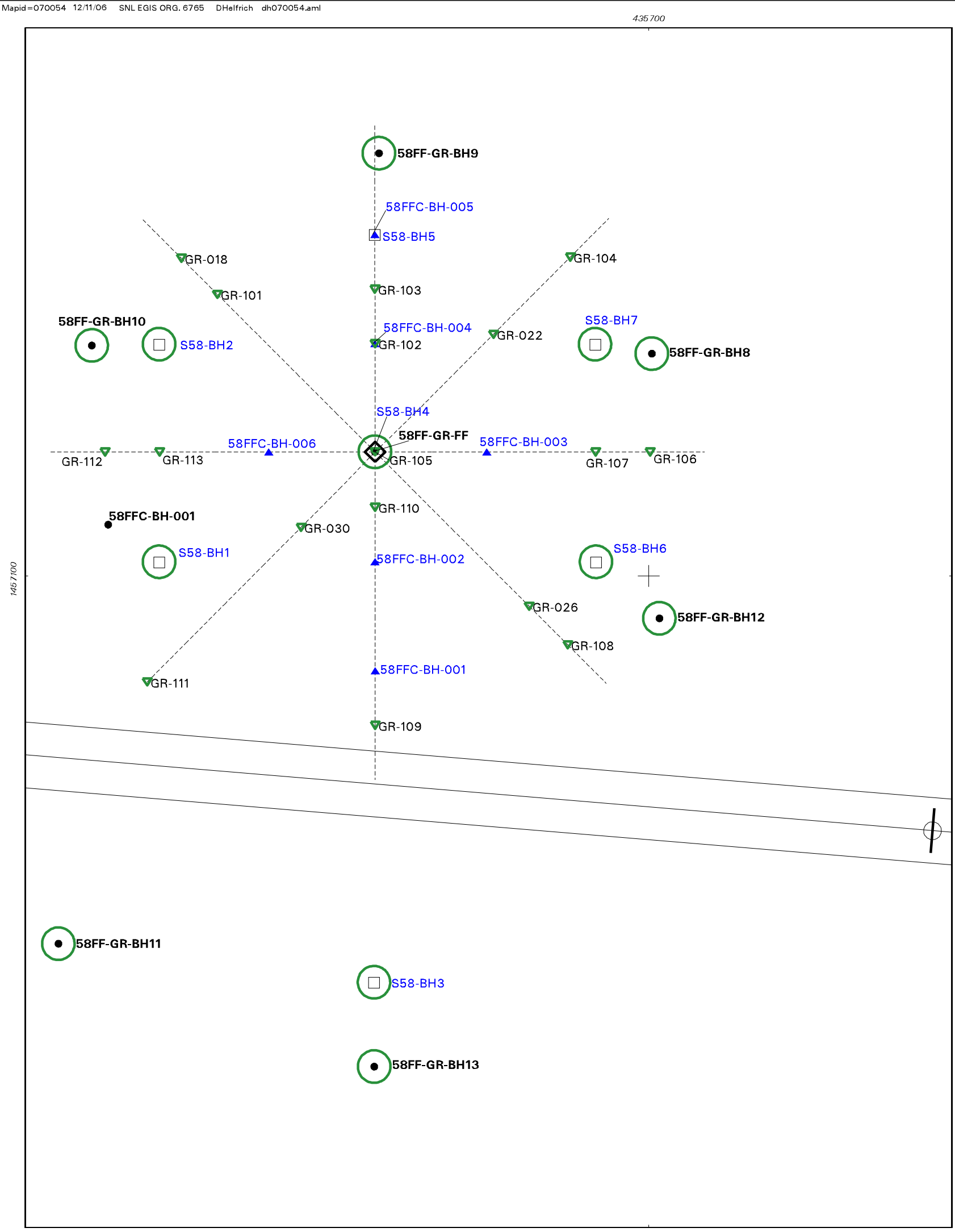
Figure 2-20
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 35')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B21

Mapid=070054 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070054.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-21
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 40')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B22

Mapid=070055 12/11/06 SNL EGIS ORG. 6757 DHelfrich dh070055.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
S58-BH7
37.6
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
58FF-GR-BH8
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FFC-BH-001
GR-110
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 37.6 Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-22
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 45')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

N

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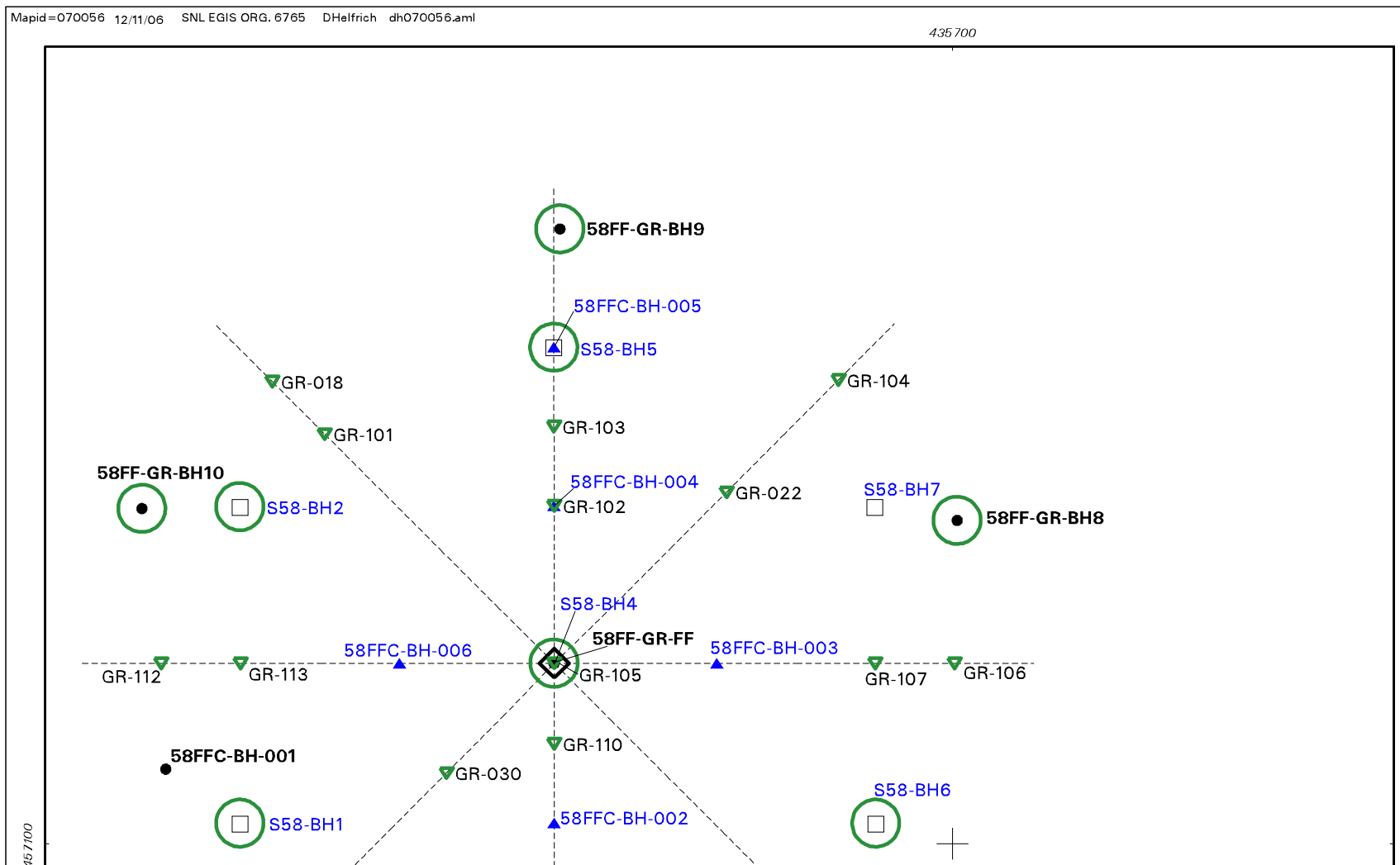
Environmental Geographic Information System

840857.02140000 B23

Mapid=070056 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070056.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-23
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 50')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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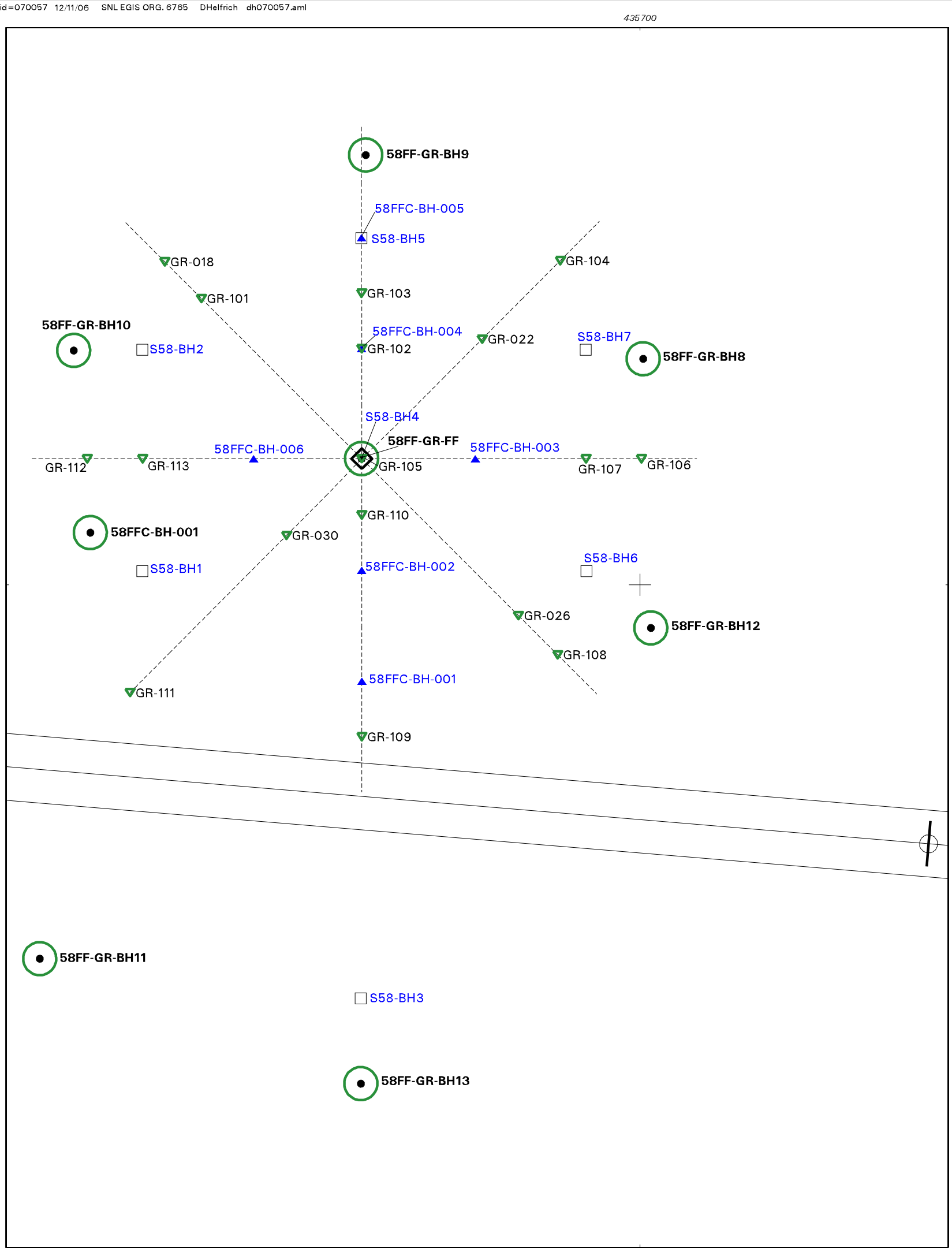
Environmental Geographic Information System

840857.02140000 B24

Mapid=070057 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070057.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-24
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 60')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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Environmental Geographic Information System

840857.02140000 B25

Mapid=070058 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070058.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH7
S58-BH2
GR-102
GR-022
58FF-GR-BH8
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
GR-110
58FFC-BH-001
GR-030
S58-BH6
S58-BH1
58FFC-BH-002
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration </= Background (18.9 mg/kg)

Figure 2-25
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 70')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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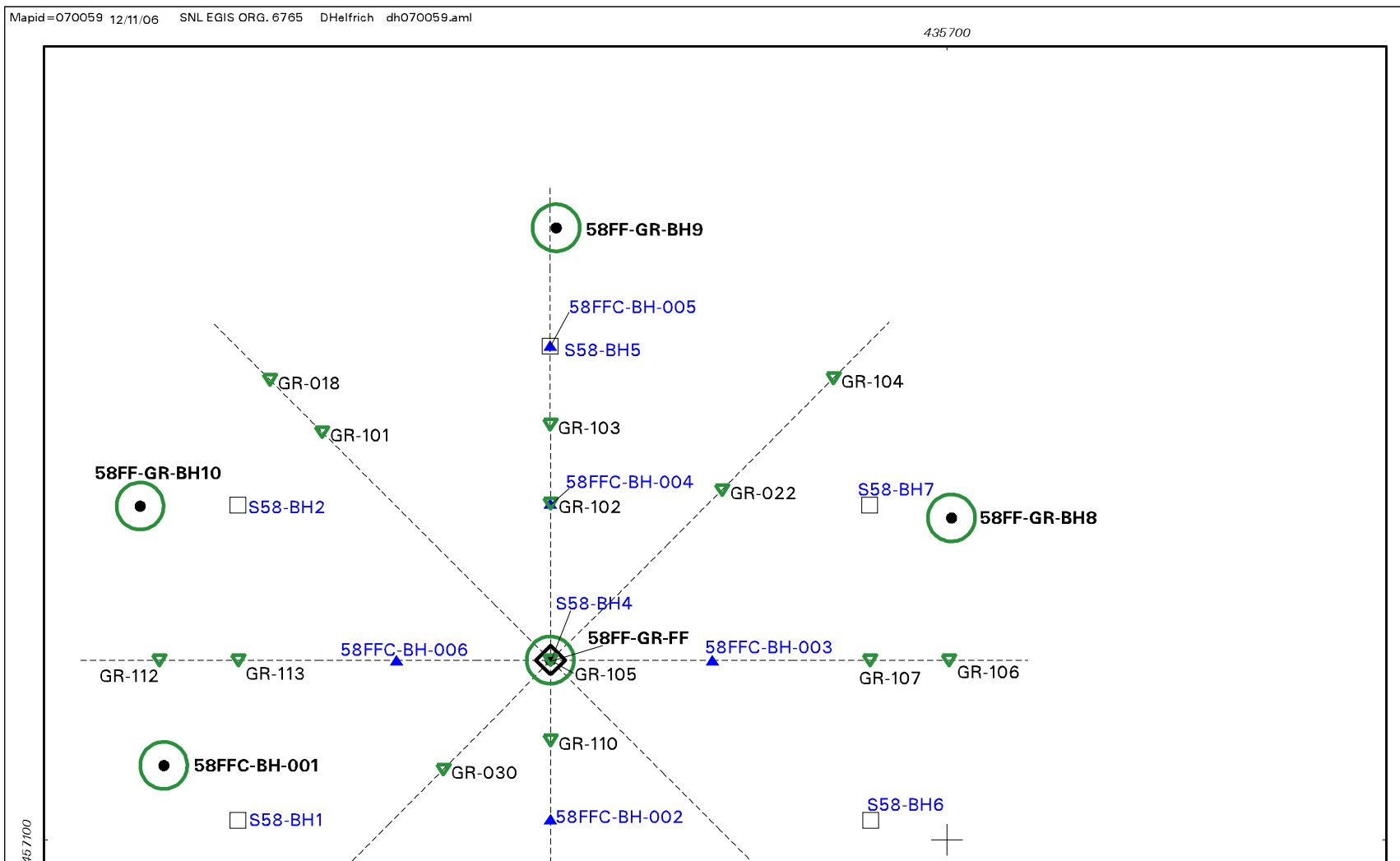
Environmental Geographic Information System

840857.02140000 B26

Mapid=070059 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070059.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-26
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 80')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B27

Mapid=070060 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070060.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH7
S58-BH2
GR-102
GR-022
58FF-GR-BH8
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
GR-110
58FFC-BH-001
GR-030
S58-BH6
S58-BH1
58FFC-BH-002
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13
19.2

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 19.2 Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-27
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 90')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B28

Mapid=070061 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070061.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH2
GR-102
GR-022
S58-BH7
58FF-GR-BH8
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
GR-110
58FFC-BH-001
GR-030
S58-BH6
S58-BH1
58FFC-BH-002
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- Lead Concentration > Background (lead concentration in mg/kg)
- Lead Concentration <= Background (18.9 mg/kg)

Figure 2-28
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Lead Concentrations
(Sampling Depth: 100')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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Environmental Geographic Information System

840857.02140000 B29

Mapid=070034 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070034.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-101
GR-103
GR-104
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
58FF-GR-BH16
58FFC-BH-001
GR-110
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109

1457100

1457100

58FF-GR-BH11

S58-BH3

58FF-GR-BH13

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration <= Background (16.6 mg/kg)

Figure 2-29
Surface Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B30

Mapid=070035 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070035.aml

435700

58FF-GR-BH9

58FFC-BH-005

S58-BH5

GR-018

GR-104

GR-101

GR-103

58FF-GR-BH10

58FFC-BH-004

S58-BH7

S58-BH2

GR-022

GR-102

58FF-GR-BH8

58FF-GR-BH15

58FF-GR-BH18

S58-BH4

58FF-GR-FF

58FFC-BH-006

58FFC-BH-003

GR-112

GR-113

GR-105

GR-107

GR-106

58FF-GR-BH14

58FF-GR-BH17

GR-110

58FF-GR-BH16

58FFC-BH-001

GR-030

S58-BH1

58FFC-BH-002

S58-BH6

GR-026

58FF-GR-BH12

GR-108

GR-111

58FFC-BH-001

GR-109

58FF-GR-BH11

S58-BH3

58FF-GR-BH13

1457100

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration <= Background (16.6 mg/kg)

Figure 2-30
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Nickel Concentrations
(Sampling Depth: 2')

0 10 20
Scale in Feet

0 2 4
Scale in Meters

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Environmental Geographic Information System

840857.02140000 B31

Mapid=070036 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070036.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
S58-BH7
GR-022
GR-102
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FFC-BH-006
58FF-GR-FF
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
61.1
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
1457100
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 61.1 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-31
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 4')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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Environmental Geographic Information System

840857.02140000 B32

Mapid=070037 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070037.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
19.1
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 19.1 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

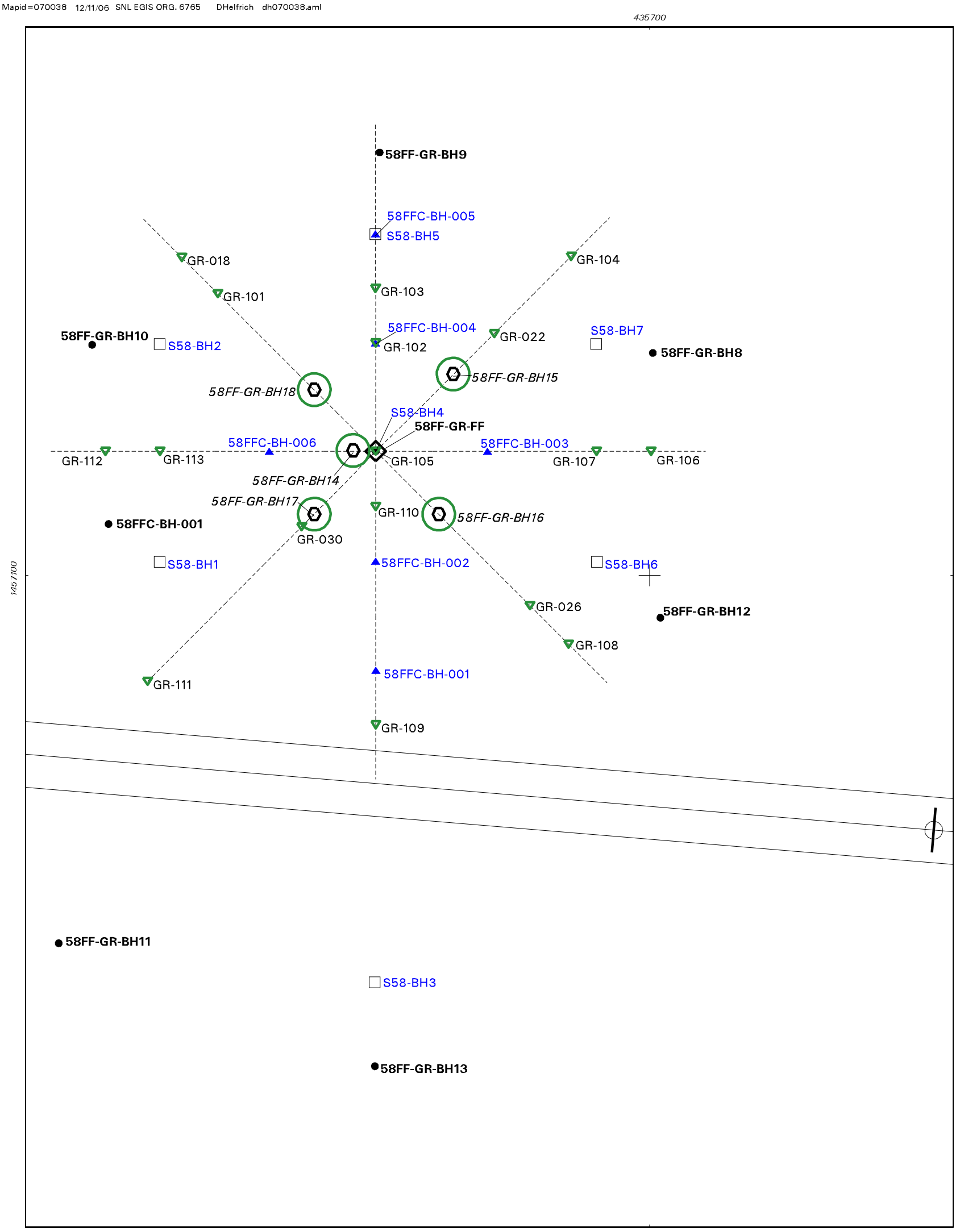
Figure 2-32
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Nickel Concentrations
(Sampling Depth: 6')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B33

Mapid=070038 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070038.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration <= Background (16.6 mg/kg)

Figure 2-33
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 8')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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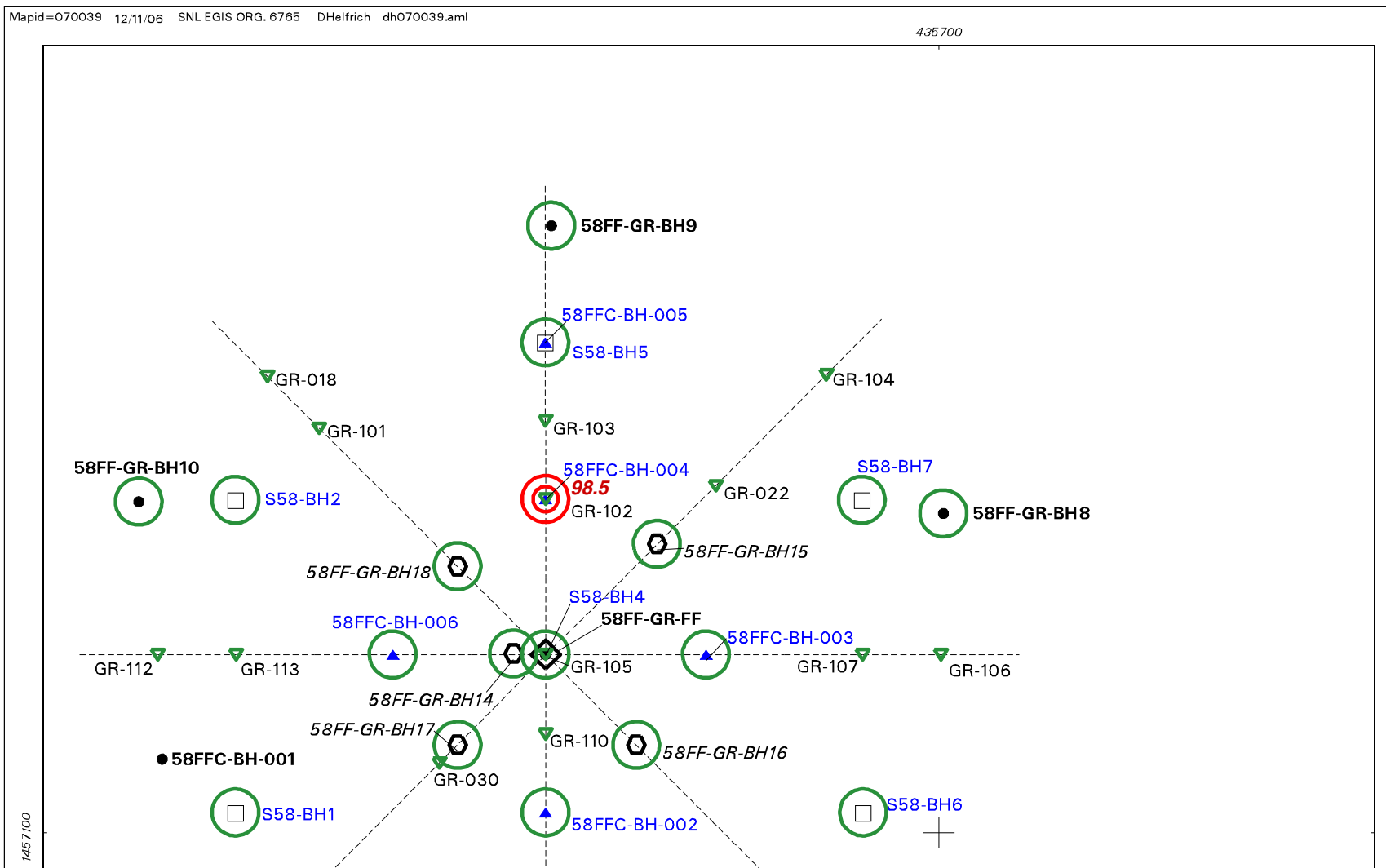
Environmental Geographic Information System

840857.02140000 B34

Mapid=070039 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070039.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 98.5 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-34
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 10')

0 10 20
Scale in Feet

0 2 4
Scale in Meters

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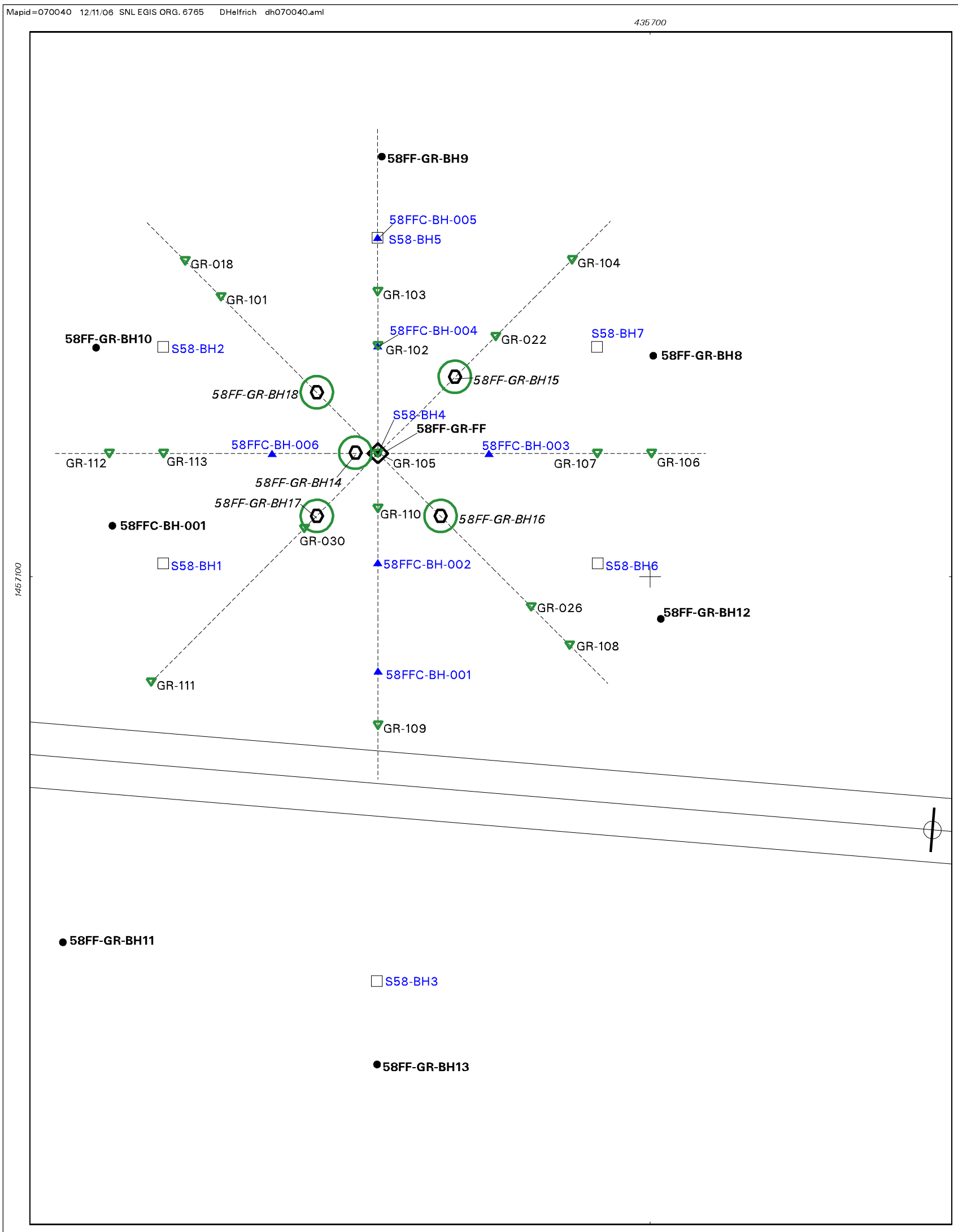
Environmental Geographic Information System

840857.02140000 B35

Mapid=070040 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070040.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-35
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Nickel Concentrations
(Sampling Depth: 12′)

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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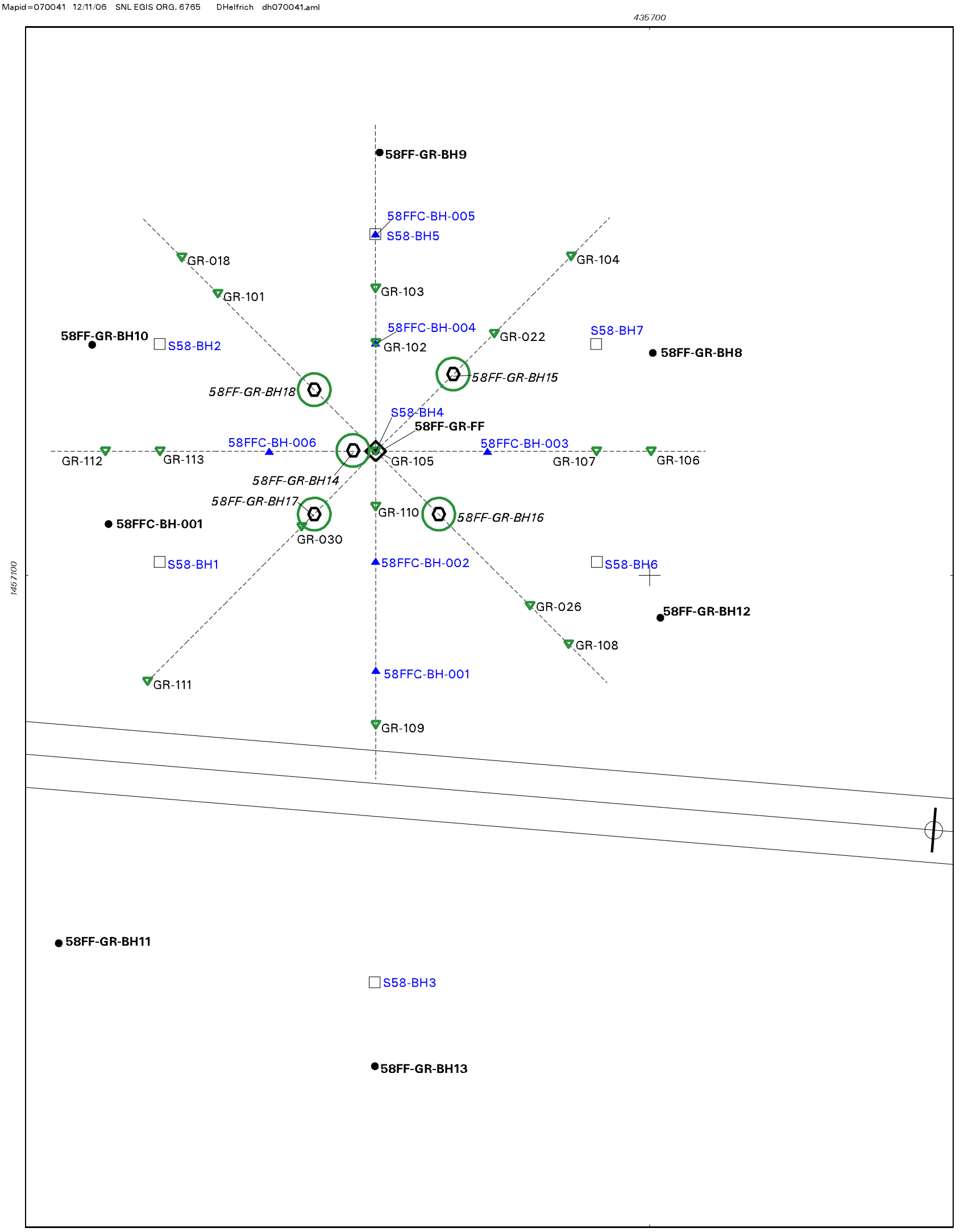
840857.02140000 B36

Mapid=070041 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070041.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-36
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Nickel Concentrations
(Sampling Depth: 14′)

0 10 20
Scale in Feet

0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B37

Mapid=070042 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070042.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH7
S58-BH2
GR-102
GR-022
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
GR-111
58FFC-BH-001
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

145700

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration <= Background (16.6 mg/kg)

Figure 2-37
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 16')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B38

Mapid=070043 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070043.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
S58-BH7
GR-022
GR-102
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration <= Background (16.6 mg/kg)

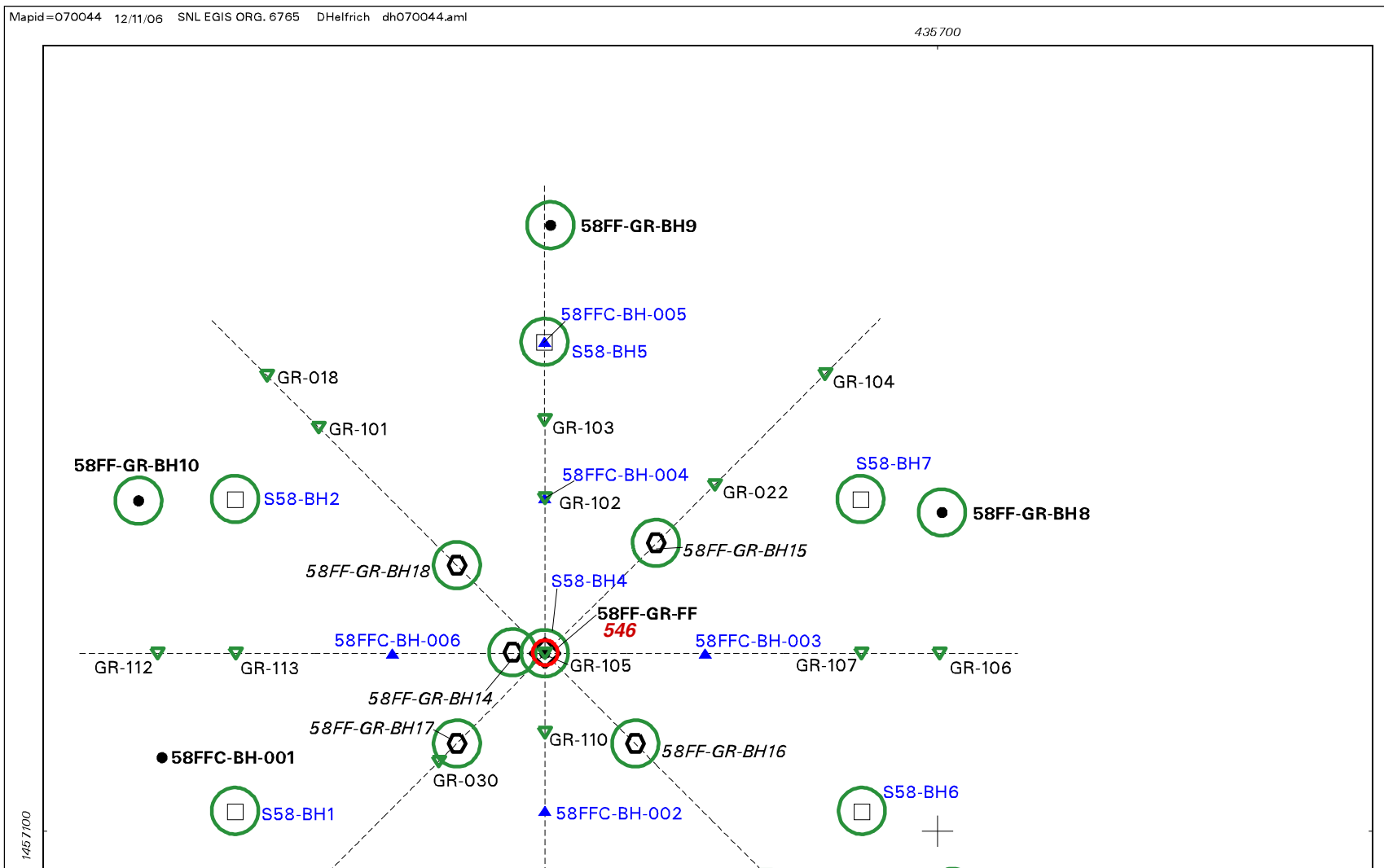
Figure 2-38
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 18')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B39

Mapid=070044 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070044.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 546 — Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-39
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 20')

0 10 20
Scale in Feet

0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B40

Mapid=070045 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070045.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
58FF-GR-BH18
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
58FF-GR-BH17
GR-110
58FF-GR-BH16
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
GR-108
GR-111
58FFC-BH-001
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

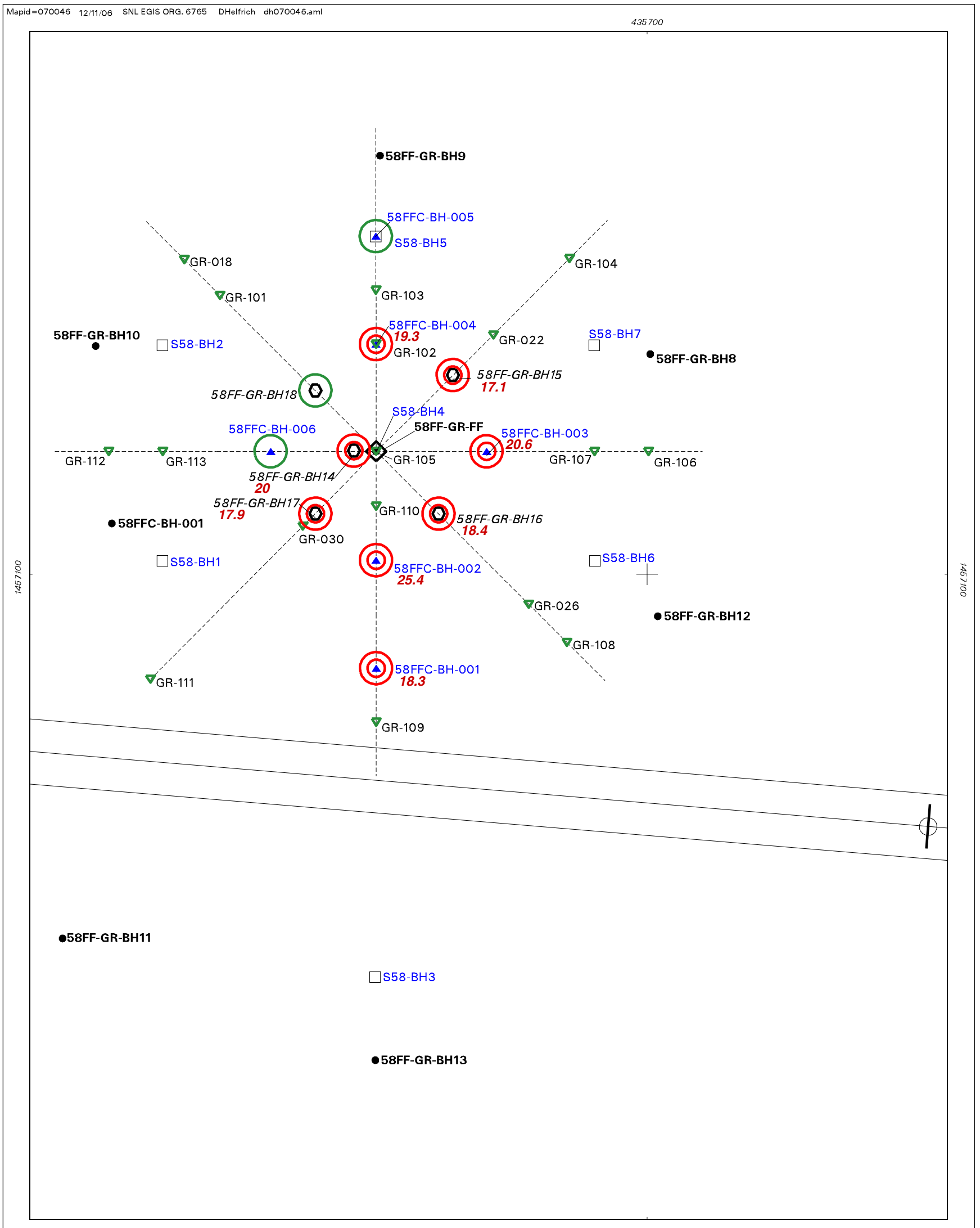
Figure 2-40
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Nickel Concentrations
(Sampling Depth: 22′)

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B41

Mapid=070046 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070046.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 546 — Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-41
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 24')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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Environmental Geographic Information System

840857.02140000 B42

Mapid=070047 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070047.aml

435700

58FF-GR-BH9
17.8

58FFC-BH-005
S58-BH5

GR-018
GR-101
GR-104
GR-103

58FF-GR-BH10
S58-BH2
58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
16.9

58FF-GR-BH18
19.6
58FF-GR-BH15
29.4

S58-BH4
58FFC-BH-006
58FF-GR-FF
58FFC-BH-003

GR-112
GR-113
GR-105
GR-107
GR-106

58FF-GR-BH14
27.8

58FF-GR-BH17
22.4
GR-110
58FF-GR-BH16
31.4

58FFC-BH-001
GR-030

S58-BH1
58FFC-BH-002
S58-BH6

GR-026
58FF-GR-BH12
16.9
GR-108

58FFC-BH-001
GR-111

GR-109

58FF-GR-BH11

S58-BH3

58FF-GR-BH13
21.4

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 31.4 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-42
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 26')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B43

Mapid=070048 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070048.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR-018
GR-104
GR-101
GR-103
58FF-GR-BH10
S58-BH2
58FFC-BH-004
24.5
GR-102
GR-022
S58-BH7
58FF-GR-BH8
58FF-GR-BH15
28 / 39.2
58FF-GR-BH18
26.8
S58-BH4
58FF-GR-FF
58FFC-BH-006
67.6
58FFC-BH-003
3960
GR-112
GR-113
GR-105
GR-107
GR-106
58FF-GR-BH14
37
58FF-GR-BH17
76.5 / 64.3
GR-110
58FF-GR-BH16
28.9 / 29.4
58FFC-BH-001
GR-030
S58-BH1
58FFC-BH-002
33.4
S58-BH6
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
631
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 631 — Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration <= Background (16.6 mg/kg)

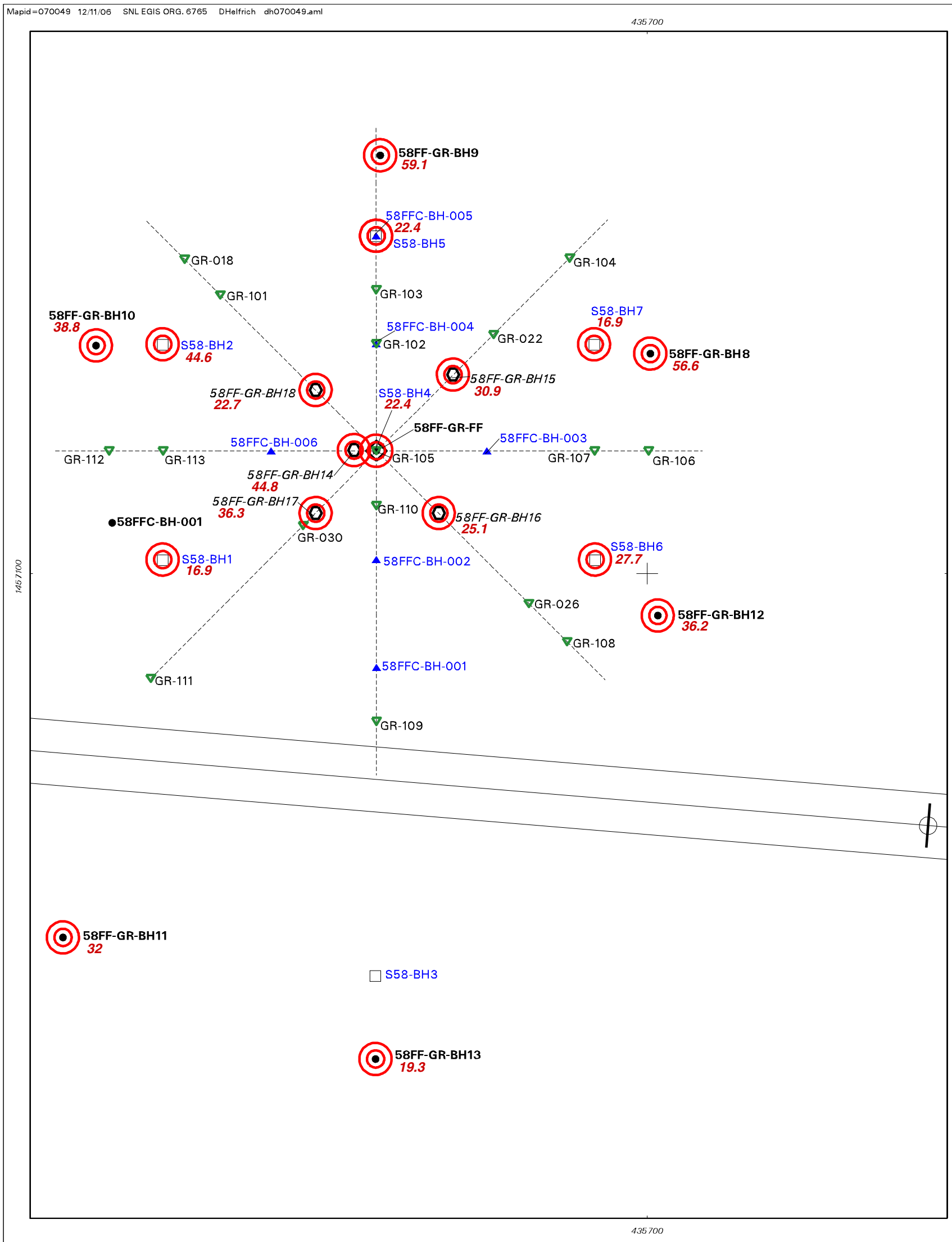
Figure 2-43
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 28')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B44

Mapid=070049 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070049.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- September 2006 Boring Location
- Power Pole
- Power Line
- Grid Line
- 16.9 — Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-44
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 30')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B45

Mapid=070021 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070021.aml

435700

58FF-GR-BH9
23.6

58FFC-BH-005
S58-BH5

GR-018
GR-101
GR-104
GR-103

58FF-GR-BH10
18.4
S58-BH2

58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
24.2

S58-BH4

58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106

GR-110
58FFC-BH-001
GR-030
S58-BH6
S58-BH1
58FFC-BH-002
GR-026
58FF-GR-BH12
43.4
GR-108
58FFC-BH-001
GR-111
GR-109

58FF-GR-BH11
28.8

S58-BH3
26.3

58FF-GR-BH13
32.4

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 32.4 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

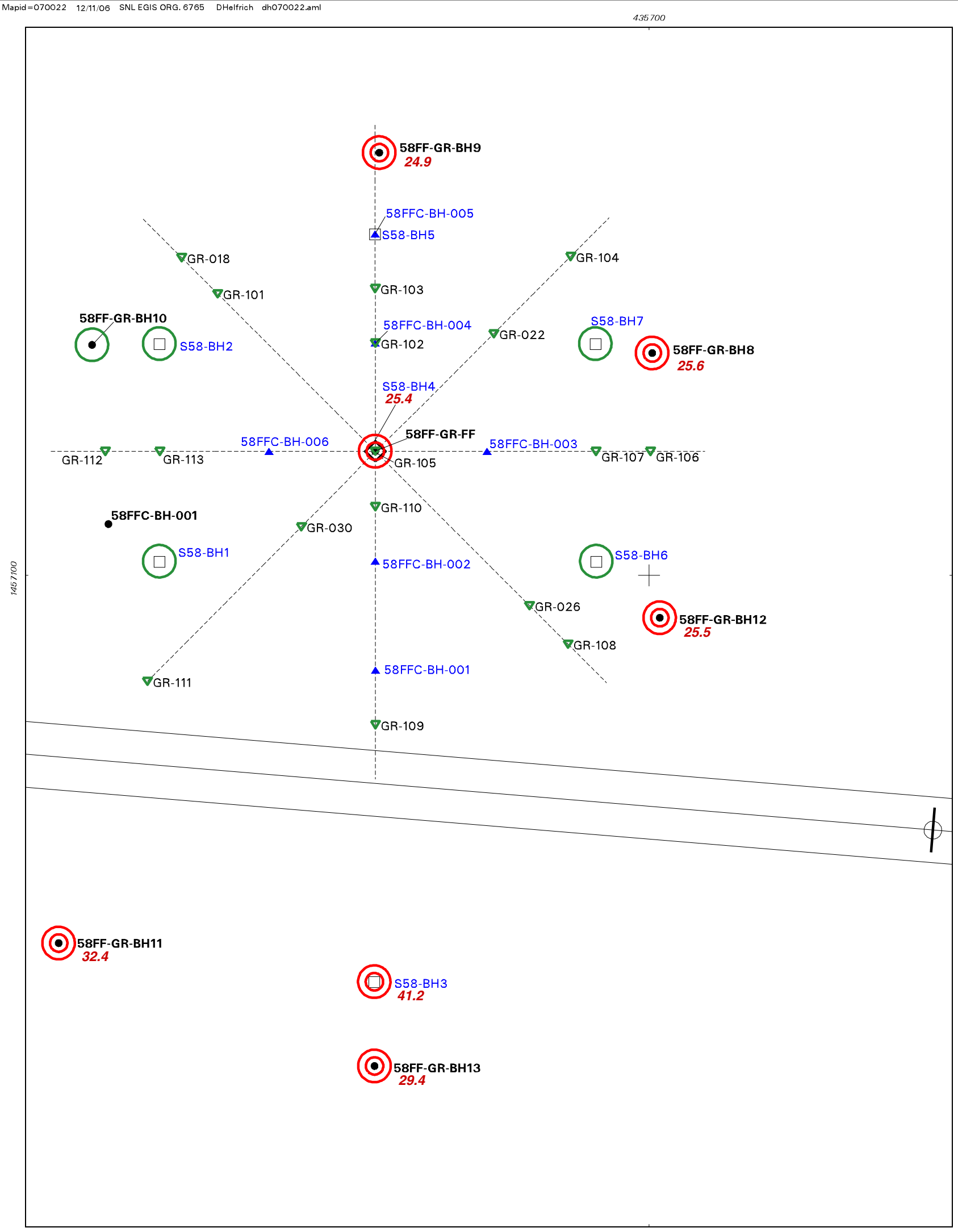
Figure 2-45
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 35')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B46

Mapid=070022 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070022.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 29.4 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

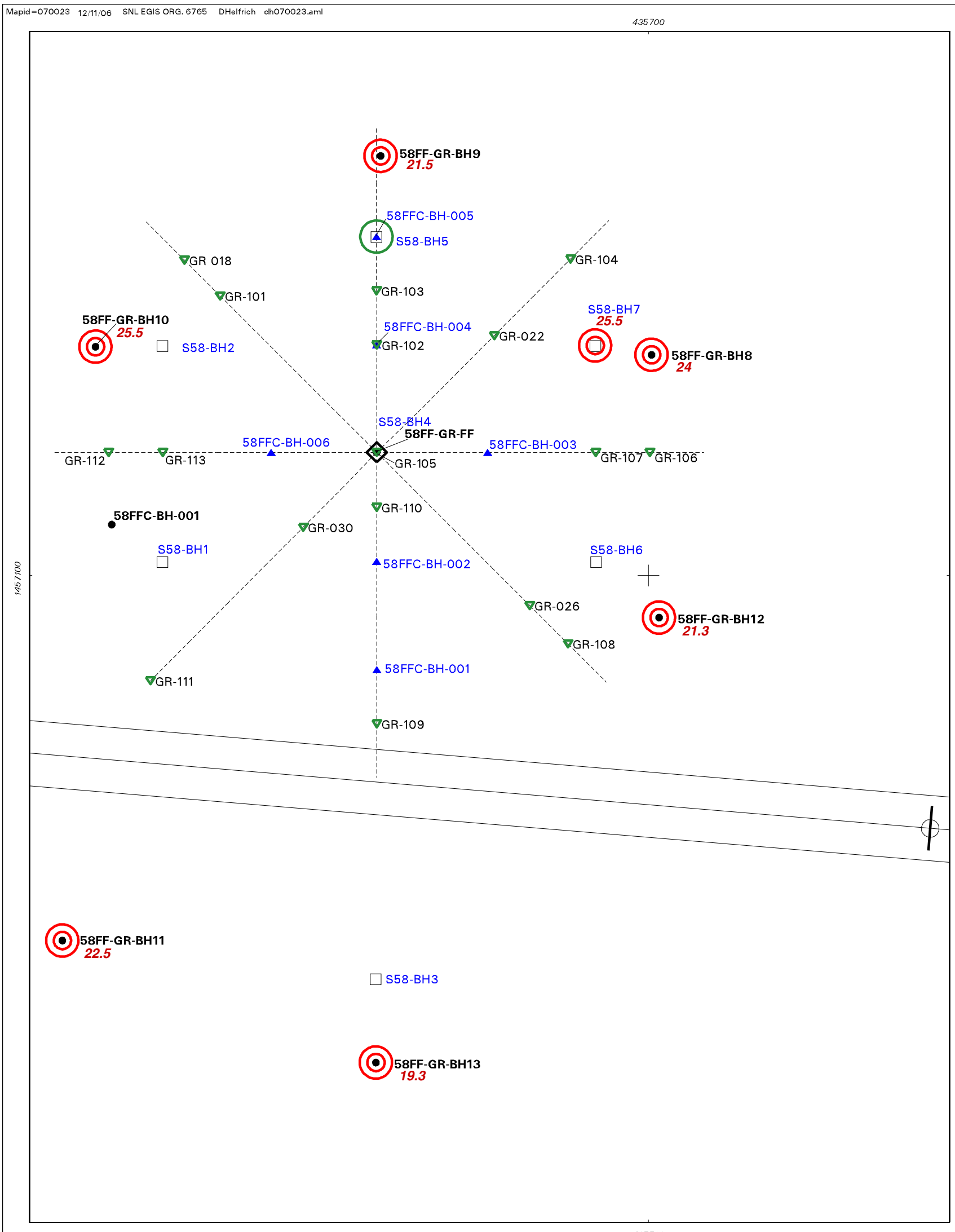
Figure 2-46
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 40')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B47

Mapid=070023 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070023.aml



Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 19.3 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-47
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 45')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B48

Mapid=070024 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070024.aml

435700

58FF-GR-BH9
23.8

58FFC-BH-005
S58-BH5
32.3

GR 018
GR-101
GR-103
GR-104

58FF-GR-BH10
25.8
S58-BH2

58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
22.2

S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106

58FFC-BH-001
GR-030
GR-110
S58-BH1
58FFC-BH-002
S58-BH6
GR-026
58FF-GR-BH12
21.1
GR-108
GR-111
58FFC-BH-001
GR-109

58FF-GR-BH11
38.3

S58-BH3
27

58FF-GR-BH13
30.6

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 30.6 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-48
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 50')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B49

Mapid=070025 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070025.aml

435700

58FF-GR-BH9
18.2

58FFC-BH-005
S58-BH5

GR 018
GR-101
GR-103
GR-104

58FF-GR-BH10
24.8
S58-BH2

58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8
23

S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106

58FFC-BH-001
20
GR-030
GR-110
S58-BH1
S58-BH6
58FFC-BH-002
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109

58FF-GR-BH11
28.6

S58-BH3

58FF-GR-BH13
73.7

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 73.7 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-49
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 60')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B50

Mapid=070026 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070026.aml

435700

58FF-GR-BH9
20.4

58FFC-BH-005
S58-BH5

GR 018
GR-101
GR-103
GR-104

58FF-GR-BH10
23.4
S58-BH2

58FFC-BH-004
GR-102
GR-022

S58-BH7
58FF-GR-BH8

S58-BH4
58FF-GR-FF
20.8 / 21.3

58FFC-BH-006
58FFC-BH-003

GR-112
GR-113
GR-105
GR-107
GR-106

58FFC-BH-001
17.6 / 17.3

GR-030
GR-110

S58-BH1
58FFC-BH-002

S58-BH6
58FF-GR-BH12

GR-026
GR-108

1457100

58FFC-BH-001
GR-111
GR-109

58FF-GR-BH11
55.4

S58-BH3

58FF-GR-BH13
33.3

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 33.3 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-50
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Nickel Concentrations
(Sampling Depth: 70')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B51

Mapid=070027 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070027.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR 018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH7
S58-BH2
GR-102
GR-022
58FF-GR-BH8
S58-BH4
58FF-GR-FF
32.4
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106
58FFC-BH-001
GR-110
GR-030
S58-BH1
S58-BH6
58FFC-BH-002
GR-026
58FF-GR-BH12
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
18
S58-BH3
58FF-GR-BH13

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 18 — Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-51
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 80')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B52

Mapid=070028 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070028.aml

435700

58FF-GR-BH9
21.7

58FFC-BH-005
S58-BH5

GR 018
GR-101
GR-103
GR-104

58FF-GR-BH10
40.1
S58-BH2

58FFC-BH-004
GR-102
GR-022
S58-BH7
58FF-GR-BH8

S58-BH4
58FF-GR-FF

58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-105
GR-107
GR-106

58FFC-BH-001
GR-030
GR-110
S58-BH6

S58-BH1
58FFC-BH-002
GR-026
58FF-GR-BH12
21.5
GR-108

58FFC-BH-001
GR-111
GR-109

1457100

58FF-GR-BH11
19.6

S58-BH3

58FF-GR-BH13
24.6

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 19.6 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-52
Soil Sample Locations at
Feature 58FF Fire Brick Area,
SWMU 58, Coyote Canyon Blast Area
Nickel Concentrations
(Sampling Depth: 90')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.02140000 B53

Mapid=070029 12/11/06 SNL EGIS ORG. 6765 DHelfrich dh070029.aml

435700

58FF-GR-BH9
58FFC-BH-005
S58-BH5
GR 018
GR-104
GR-101
GR-103
58FF-GR-BH10
58FFC-BH-004
S58-BH7
S58-BH2
GR-102
GR-022
58FF-GR-BH8
S58-BH4
58FF-GR-FF
58FFC-BH-006
58FFC-BH-003
GR-112
GR-113
GR-107
GR-106
GR-105
GR-110
58FFC-BH-001
GR-030
S58-BH6
S58-BH1
58FFC-BH-002
GR-026
58FF-GR-BH12
17.7
GR-108
58FFC-BH-001
GR-111
GR-109
58FF-GR-BH11
S58-BH3
58FF-GR-BH13
21.2

1457100

435700

Legend

- June 1995 and January 1999 Surface Soil Sample
- April 1996 and October 2005 Boring Location
- August 1996 Boring Location
- April 1997 Boring Location
- October 2005 Boring Location
- Power Pole
- Power Line
- Grid Line
- 21.2 Nickel Concentration > Background (nickel concentration in mg/kg)
- Nickel Concentration </= Background (16.6 mg/kg)

Figure 2-53
Soil Sample Locations at Feature 58FF Fire Brick Area, SWMU 58, Coyote Canyon Blast Area Nickel Concentrations (Sampling Depth: 100')

0 10 20
Scale in Feet
0 2 4
Scale in Meters

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Environmental Geographic Information System

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3.0 FEATURE 58FF 1995–2006 LEAD AND NICKEL ANALYTICAL RESULTS SUMMARY

3.1 Lead Results

As shown in Tables 2-3, 2-14, and 2-15 and Figure 2-4, it is apparent that residual lead contamination is present on the surface at Feature 58FF based upon the surface samples that were collected in June 1995, April 1996, January 1999, and September 2006. As shown in Table 2-15, lead concentrations that exceed the background value have also been detected in four subsurface samples from this site. In August 1996, the auger borehole 58FFC-BH-002 was drilled approximately 10 feet southwest of the center of Feature 58FF, and lead was detected at 74.8 milligrams (mg)/kilogram (kg) in the 4- to 5-foot sample from this borehole (Figure 2-6). In April 1996, a borehole (58FF-GR-FF) was drilled in the center of Feature 58FF with an auger rig, and lead concentrations of 15,000 and 6,250 mg/kg were detected at depths of 5 to 6 feet bgs and 19 to 20 feet bgs, respectively. However, in September 2006, another borehole (58FF-GR-BH14) was drilled at a location 2 feet west of 58FF-GR-FF, and the samples collected from essentially the same 6- and 20-foot depths contained only below-background lead concentrations. Thirteen additional deep boreholes were drilled with the dual-tube rig at Feature 58FF in October 2005 (eight boreholes) and September 2006 (five boreholes) (Tables 2-1 through 2-13 and Figures 2-4 through 2-28). Sampling depths varied in each borehole and ranged from 2 to 100 feet bgs. Lead concentrations in samples recovered from the 13 boreholes were all less than the background value, with the single exception of the 90-foot-bgs sample from 58FF-GR-BH13, where lead was found at the slightly elevated concentration of 19.2 mg/kg (Table 2-11).

3.2 Nickel Results

As shown in Tables 2-1 through 2-5, 2-14, 2-15 and Figure 2-29, nickel concentrations were less than the background value in all surface soil samples collected from Feature 58FF. As shown in Table 2-15, significantly elevated nickel concentrations were detected in three subsurface samples from this site. In August 1996, nickel concentrations of 631 J and 3,960 J mg/kg were detected in the 28- to 29-foot samples from the auger boreholes 58FFC-BH-001 and 58FFC-BH-003, respectively. These boreholes were located approximately 25 feet south, and 10 feet east, of the center of Feature 58FF. In the April 1996 auger borehole 58FF-GR-FF (drilled in the center of Feature 58FF), 546 J mg/kg of nickel was detected in the 19- to 20-foot-bgs sample. However, another sample was collected from the same location and depth with an auger rig in April 1997 in a borehole designated S58-BH4, and the nickel concentration was below the background value in this sample. A third sample was collected at the same depth in September 2006 from 58FF-GR-BH14 (located 2 feet west of 58FF-GR-FF). This sample was collected with the dual-tube rig, and the nickel concentration was also below the background value in this sample. However, as shown in Tables 2-1 through 2-13 and Figures 2-29 through 2-53, nickel concentrations in soil samples collected from all 13 of the 2005 and 2006 dual-tube rig boreholes from the surface to approximately 24 feet bgs were below the background value. Deeper samples from these boreholes for the most part exhibited slight nickel exceedances above background.

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4.0 FEATURE 58FF 1995–2006 LEAD AND NICKEL EVALUATION AND CONCLUSIONS

As described in the March 2006 supplemental response report (SNL/NM March 2006), documented activities conducted at the Feature 58FF Fire Brick Area included burn tests in which weapons were subjected to a jet fuel fire to determine how the conventional explosives inside the weapons would react. These weapons burn tests may have caused metal shrapnel to be deposited on the surface of the site if weapons actually detonated during the burn tests. Most of the materials released in the surface or near-surface soil as a result of the burn tests would have been nonhazardous materials such as aluminum, steel, and other metal alloys from the weapon cases, metal pans, and test components. Lead alloy was present at Feature 58FF and may have been released to the environment (SNL/NM April 2005). Therefore, based upon the types of testing conducted at Feature 58FF, only surface metals contamination would be expected at this site, and the contamination would not be expected to extend into the subsurface.

4.1 Lead Evaluation and Conclusions

As discussed in Section 3.1, residual lead contamination is present on the surface at Feature 58FF, and sporadic, above-background detections of lead were also identified in a few of the subsurface samples collected from auger boreholes at the site. Alluvial material at Feature 58FF consists of an unconsolidated to semiconsolidated mixture of silt, sand, and fine to coarse gravel. This alluvial material also contains variable amounts of rocks, cobbles, and boulders of various sizes. It is difficult to drill through, and collect representative samples of, this type of material with an auger rig and split-spoon sampler. The auger drill string typically must be repeatedly raised and lowered in the borehole in order to work down through rocky ground to reach the target sampling depth. This raising and lowering procedure can often result in material from the surface and upper portion of the borehole dropping to the bottom and mixing with material that is collected with a split spoon at the designated sampling depths. This can result in the subsurface samples becoming “contaminated” by surface contaminants at the site, giving the appearance of subsurface contamination at the site when in fact there is none.

However, with only one minor exception, lead was not detected above the background concentration in any of the samples from 13 boreholes drilled with the dual-tube rig. This type of drilling employs double-walled drill pipe in which high-pressure, compressed air is forced down the annular space between the outer and inner pipe, and exhaust air and borehole cuttings are returned to the surface through the center of the cylindrical drill bit, up the center of the drill pipe. Material to be used for samples is then collected from the bottom of the cuttings cyclone (Figure 2-3). The drill pipe is advanced to depth by a very powerful diesel-powered pile driver that literally pounds the drill pipe and bit down into the ground as cuttings are returned to the surface. The dual tube drill pipe and silicone carbide-hardened drill bit are very heavy, robust tools. This drilling equipment is designed to withstand the pounding from the pile driver and is able to penetrate rocky, alluvial material with minimal wear and breakage. Any rocks encountered that are too large to be returned to the surface in the center of the drill pipe are broken apart by the pounding action of the pile driver on the drill pipe and bit and are then returned to the surface. The borehole wall is tightly sleeved at all times by the drill pipe, which completely prevents material from the upper portion of the borehole from dropping to the bottom and potentially becoming incorporated into the samples, as opposed to samples collected with

an auger rig and split spoon. The dual-tube drilling method produces reliable subsurface samples that are representative of the material at depth and are not impacted by "uphole" material. This is an effective and reliable drilling and sampling method for collecting representative samples of unconsolidated, rocky, alluvial material as is found at this site.

It is therefore considered likely that the elevated lead concentrations sporadically detected in some of the earlier subsurface auger borehole samples resulted from surface lead at the site that dropped into the boreholes while they were being drilled and became incorporated into the subsurface soil samples. The dual-wall borehole samples conclusively demonstrate that there is no subsurface lead contamination at this site.

4.2 Nickel Evaluation and Conclusions

As discussed in Section 3.2, significantly elevated nickel concentrations were detected in several subsurface samples collected from auger rig boreholes at this site, but nickel results above background concentrations were not reported in any of the surface soil samples collected from this site. Nickel concentrations were less than the background value to a depth of about 24 feet bgs in all of the 13 dual-wall boreholes (Tables 2-1 through 2-13, September 2006 and October 2005 boreholes). Sample results from about 24 feet bgs to the bottom of the boreholes were, for the most part, slightly above background concentrations. As discussed in the March 2006 supplemental response report (SNL/NM March 2006), it is highly unlikely that this phenomenon was caused by surface testing activities conducted at Feature 58FF. Instead, it appears to reflect naturally occurring subsurface conditions at the site.

Because the surface samples showed no nickel concentrations above the background value, it cannot be demonstrated that the elevated nickel concentrations found in some of the subsurface samples are the result of surface nickel contamination at the site, as appears to be the case for lead. However, when the nickel concentrations in auger rig borehole samples are compared to those collected with the dual-tube rig, it is apparent that the three significant subsurface nickel detections (found only in auger borehole samples) are an artifact of the sample collection technique, rather then actual subsurface contamination at the site. It is possible that the relatively high nickel concentrations found in the three samples were caused by small particles of metal that were scraped from the split-spoon samplers as they were being driven into the rocky, alluvial material found at this site and that became incorporated into the samples. Stainless steel (used for the split-spoon samplers) typically contains from 8 to 14 percent nickel (Bo'sun December 2006). Given that significant nickel concentrations were not found in any of the samples from the 13 dual-tube boreholes, it is apparent that subsurface nickel contamination is also not present at this former surface test site.

5.0 FEATURE 58FF 2006 SOIL SAMPLING QUALITY ASSURANCE/ QUALITY CONTROL SAMPLES AND DATA VALIDATION RESULTS

During the September 2006 sampling event at Feature 58FF, quality assurance/quality control samples were collected. As shown in Tables 2-1 through 2-5, these included both soil duplicate and equipment blank (EB) samples.

5.1 Duplicate Samples

Duplicate soil samples were collected from two depth intervals in borehole 58FF-GR-BH14, and one duplicate was collected from each of the other four boreholes. Duplicate samples were collected from the five 2006 boreholes at depths from which the highest lead and nickel concentrations had been detected in samples collected in April and August 1996 (Table 2-15). A total of 80 primary and 6 duplicate samples were collected during the September 2006 sampling event, resulting in an overall duplicate sample collection rate of 1 duplicate per approximately 13 primary samples.

Relative percent differences (RPDs) were calculated for the lead and nickel detected in the primary and duplicate sample pairs and are presented in Table 5-1. The analyses of the sample pairs for lead and nickel yielded 3 out of 12 RPDs that exceeded the generally acceptable RPD goal of less than 20 percent (EPA November 1986). Although three of the RPDs presented in Table 5-1 exceed the 20-percent RPD variability limit, the values are typical of the distribution of metals in heterogeneous soil samples and are therefore acceptable.

5.2 Equipment Blank Samples

As shown in Tables 2-2 and 2-4, two EB samples were collected during the September 2006 sampling event. These EB samples were analyzed by GEL for the same metals (lead and nickel) as the 2006 confirmatory soil samples collected from the site. Lead and nickel were not detected above the method detection limit in either of the EB samples, which indicated that the equipment decontamination procedures used during collection of the September 2006 samples were acceptable. Therefore, transfer and cross-contamination of constituents between sampling locations from reusable sampling equipment did not occur.

5.3 Data Validation

All laboratory data were reviewed and verified/validated according to the “Data Validation Procedure for Chemical and Radiochemical Data,” AOP [Administrative Operating Procedure] 00-03, Rev. 01 (SNL/NM December 2003). Annex A contains the data validation report for the samples collected in September 2006 from Feature 58FF. The data are acceptable for use in this request for a determination of CAC without controls.

Table 5-1
Summary of the SWMU 58, Feature 58FF Field Duplicate Sample RPD Values for Lead and Nickel Analyses of Confirmatory Soil Samples, September 2006
(Off-Site Laboratory)

Sample Attributes			Primary and Duplicate Sample Metals Concentrations (mg/kg)	
Record Number[a]	ER Sample ID	Sample Depth (ft)	Lead	Nickel
610763	58FF-GR-BH14-6-S	6	4.97	9.14
610763	58FF-GR-BH14-6-SD	6	5.17	9.6
	58FF-GR-BH14-6: RPD[b]	NA	**3.94**	**4.91**
610763	58FF-GR-BH14-20-S	20	6.67	10.7
610763	58FF-GR-BH14-20-SD	20	8.85	12.3
	58FF-GR-BH14-20: RPD[b]	NA	**28.09**	**13.91**
610764	58FF-GR-BH15-28-S	28	8.64	28
610764	58FF-GR-BH15-28-SD	28	8.78	39.2
	58FF-GR-BH15-28: RPD[b]	NA	**1.61**	**33.33**
610765	58FF-GR-BH16-28-S	28	6.89	28.9
610765	58FF-GR-BH16-28-SD	28	6.98	29.4
	58FF-GR-BH16-28: RPD[b]	NA	**1.30**	**1.72**
610766	58FF-GR-BH17-28-S	28	12.1	76.5
610766	58FF-GR-BH17-28-SD	28	10.4	64.3
	58FF-GR-BH16-28: RPD[b]	NA	**15.11**	**17.33**
610767	58FF-GR-BH18-10-S	10	5.61	9.39
610767	58FF-GR-BH18-10-SD	10	5.35	7.58
	58FF-GR-BH18-10: RPD[b]	NA	**4.74**	**21.33**

Note: Right-justified RPD values exceed the generally acceptable RPD goal of 20%.
[a]Analysis Request/Chain-of-Custody record.
[b]RPD calculated as follows: $[(X_1 - X_2)/((X_1 + X_2)/2)] \times 100$ where X_1 and X_2 are the metals concentrations in the primary and duplicate samples, respectively.
BH = Borehole.
ER = Environmental Restoration.
ft = Foot (feet).
GR = Grab sample.
ID = Identification.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
RPD = Relative percent difference.
S = Soil sample.
SD = Sample duplicate.
SWMU = Solid Waste Management Unit.

6.0 SWMU 58, FEATURE 58FF REVISED RISK ASSESSMENT

The SWMU 58, Feature 58FF and the SWMU 8 and 58 Combination Area human health risk assessments presented in the April 2005 CAC proposal (SNL/NM April 2005) and the March 2006 supplemental response (SNL/NM March 2006) have been revised to reflect the additional lead and nickel sampling data collected at Feature 58FF in September 2006. Both the maximum and upper confidence limit (UCL) of the mean concentrations for lead and nickel have been reevaluated, where appropriate.

The lead and nickel analytical data for all of the 2006 samples were incorporated into both the Feature 58FF and SWMU 8 and 58 Combination Area data sets that were used for previous risk assessment evaluations. The UCL of the mean concentrations for these two metals were also recalculated for both data sets (Annex B). As discussed in the March 2006 supplemental response (SNL/NM March 2006), the metals detected above background concentrations in all previous SWMU 8 and 58 samples collected from 1996 through 2005 at depths of 30 feet bgs or greater were considered to be naturally occurring, and therefore were not included in the risk assessment presented in that document. Although the slightly above-background nickel concentrations starting at approximately 24 feet bgs are considered to be naturally occurring, the maximum concentrations of both lead and nickel that were detected in the 2006 samples were included in this human health risk reevaluation for both Feature 58FF and the SWMU 8 and 58 Combination Area data sets.

The revised nonradiological risk assessment results for Feature 58FF and the SWMU 8 and 58 Combination Area are summarized in the following sections. In addition, the single above-background lead value (23 mg/kg) in 2006 did not vary from the historical analytical data. The ecological risk was not affected because the maximum lead concentration used in previous SWMU 8 and 58 risk assessments was greater than the maximum lead concentration from the 2006 sampling event. Therefore, the ecological risk assessment results from the original April 2005 risk assessment (SNL/NM April 2005) were not impacted, and the ecological risk assessment was not revised.

6.1 Feature 58FF Revised Human Health Risk Assessment

The maximum concentration value for lead that was evaluated in the March 2006 supplemental response (SNL/NM March 2006) risk assessment was 15,000 mg/kg (detected in an April 1996 auger borehole sample). The U.S. Environmental Protection Agency (EPA) intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, NMED guidance for lead screening concentrations for construction and industrial land-use scenarios is 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land-use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is greater than all the EPA and NMED screening values.

However, because the site has been adequately characterized, average concentrations are more representative of actual site conditions. The UCL of the mean concentration for lead (revised to include the 2006 sampling data) at Feature 58FF is 556 mg/kg (Annex B). The UCL value for lead at this site is less than the industrial screening values. Therefore, lead is

eliminated from consideration in the human health risk assessment for the industrial land-use scenario only.

6.1.1 Feature 58FF Industrial Scenario

Using conservative assumptions and a reasonable maximum exposure (RME) approach to risk assessment, calculations for the nonradiological constituents of concern (COCs) show that for the industrial land-use scenario the hazard index (HI) of 0.67 is lower than the accepted numerical standard of 1.0 suggested by risk assessment guidance from the EPA (EPA 1989) (Table 6-1). The estimated excess cancer risk is 6E-5. Thus, excess cancer risk is above the acceptable risk value (1E-5) provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.62 and the incremental excess cancer risk is 5.86E-5 for the industrial land-use scenario. The incremental HI risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk (summarized in Annex B), which include arsenic (9.51 mg/kg; below background and eliminated from further evaluation), beryllium (5.87 mg/kg), and nickel (135 mg/kg), reduces the total and estimated incremental excess cancer risk values to 8E-9 and 7.10E-9, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental excess cancer risk values for the industrial land-use scenario are below NMED guidelines.

6.1.2 Feature 58FF Residential Scenario

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (8.07) is above the accepted numerical guidance from the EPA (EPA 1989) (Table 6-1). The estimated excess cancer risk is 3E-4. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 7.52 and the incremental excess cancer risk is 2.4E-4 for the residential land-use scenario. These incremental risk calculations indicate potential risk to human health for the residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. As stated in Section 6.1.1, because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk and hazards (Annex B), which include arsenic (9.51 mg/kg; below background and eliminated from further evaluation), beryllium (5.87 mg/kg), and nickel (135 mg/kg), reduces the total HI and estimated excess cancer risk values to 0.31 and 2E-8, respectively. The incremental HI and excess cancer risk values are reduced to 0.22 and 1.51E-8, respectively. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and estimated excess cancer risk values for the residential land-use scenario are below NMED guidelines.

Table 6-1
Risk Assessment Values for Nonradiological COCs, SWMU 58, Feature 58FF, Fire Brick Area
(1995–2006 Analytical Data)

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	103 J	0.40	6E-5	4.76	3E-4
Barium	585 J	0.01	--	0.11	--
Beryllium	79.3	0.04	3E-8	0.53	7E-8
Cadmium	0.875	0.00	3E-10	0.02	6E-10
Chromium, total	161 J	0.00	--	0.00	--
Copper	62.1 J	0.00	--	0.02	--
Mercury	0.273	0.00	--	0.01	--
Nickel	3960	0.21	--	2.60	--
Silver	1.0[b]	0.00	--	0.00	--
Zinc	108 J	0.00	--	0.00	--
Organic					
Chloroform	0.0025[b]	0.00	5E-9	0.00	1E-8
Total		**0.67**	**6E-5**	**8.07**	**3E-4**

[a]EPA 1989.
[b]Maximum concentration is one-half the detection limit.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
J = Analytical result was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
-- = Information not available.

6.2 SWMU 8 and 58 Combination Area Revised Risk Assessment

The maximum concentration value for lead from the March 2006 supplemental response (SNL/NM March 2006) for the SWMU 8 and 58 Combination Area was also 15,000 mg/kg, detected in an April 1996 auger borehole. As explained in Section 6.1, the maximum concentration value for lead at this site is greater than all the EPA and NMED screening values. However, because the site has been adequately characterized, average concentrations are also more representative of actual SWMU 8 and 58 overall site conditions. The UCL of the mean concentration for lead (revised to include the 2006 sampling data) is 239 mg/kg (Annex B). The UCL of the mean value for lead at this site is less than all of the screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

6.2.1 Combination Area Industrial Scenario

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the industrial land-use scenario the HI (0.96) is lower than the accepted numerical standard of 1.0 suggested by risk assessment guidance from the EPA (EPA 1989) (Table 6-2). The estimated excess cancer risk is 9E-5. Thus, excess cancer risk is above the acceptable risk value (1E-5) provided by the NMED for an industrial land-use scenario (Bearzi January 2001). The incremental HI is 0.91, and the incremental excess cancer

Table 6-2
Risk Assessment Values for Nonradiological COCs, SWMU 8 and 58 Combination Area
(1995–2006 Analytical Data)

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	137 J	0.54	9E-5	6.33	4E-4
Barium	988 J	0.02	--	0.19	--
Beryllium	79.3	0.04	3E-8	0.53	7E-8
Cadmium	6.02	0.01	2E-9	0.15	4E-9
Chromium, total	161 J	0.00	--	0.00	--
Copper	684	0.02	--	0.24	--
Mercury	0.585	0.00	--	0.03	--
Nickel	3960	0.21	--	2.60	--
Selenium	79 J	0.02	--	0.21	--
Silver	60.5	0.01	--	0.16	--
Uranium	41	0.01	--	0.18	--
Zinc	225	0.00	--	0.01	--
Organic					
Acetone	0.021	0.00	--	0.00	--
2-Amino-4,6-dinitrotoluene	0.45 J	0.00	--	0.01	--
4-Amino-2,6-dinitrotoluene	0.68	0.00	--	0.01	--
Benzo(a)pyrene	0.235 J	0.00	1E-6	0.00	4E-6
Benzo(b)anthracene	0.202 J	0.00	1E-7	0.00	3E-7
2-Butanone	0.075	0.00	--	0.00	--
Chloroform	0.0025[b]	0.00	5E-9	0.00	1E-8
Chrysene	0.248 J	0.00	1E-9	0.00	4E-9
Diethyl phthalate	0.269 J	0.00	--	0.00	--
m-Dinitrobenzene	0.15	0.00	--	0.02	--
2,4-Dinitrotoluene	0.36 J	0.00	--	0.00	--
Ethylbenzene	0.0005[b]	0.00	3E-11	0.00	7E-11
bis(2-Ethylhexyl) phthalate	3.41	0.00	2E-8	0.00	8E-8
Fluoranthene	0.278 J	0.00	--	0.00	--
2-Hexanone	0.0157	0.00	--	0.00	--
HMX	5.6 J	0.00	--	0.00	--
Methylene chloride	0.0125[b]	0.00	8E-8	0.00	2E-7
n-Nitrosodiphenylamine	0.253 J	0.00	7E-10	0.00	3E-9
Pentachlorophenol	0.27 J	0.00	1E-8	0.00	5E-8
Pyrene	0.334 J	0.00	--	0.00	--
RDX	19.9 J	0.01	1E-6	0.11	5E-6
Toluene	0.025	0.00	--	0.00	--
2,4,6-Trinitrotoluene	20 J	0.06	3E-7	0.65	1E-6
Total		**0.96**	**9E-5**	**11.43**	**4E-4**

[a]EPA 1989.
[b]Maximum concentration is one-half the detection limit.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
J = Analytical result was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
SWMU = Solid Waste Management Unit.
-- = Information not available.

risk is 8.30E-5 for the industrial land-use scenario. The incremental HI risk calculations indicate insignificant risk to human health for the industrial land-use scenario.

Although the estimated excess cancer risk is above the NMED guideline for the industrial land-use scenario, maximum concentrations were used in the risk calculation. Because the SMWU 8 and 58 Combination Area has been adequately characterized, again average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations for the main contributors to excess cancer risk (Annex B) reduces the total and estimated incremental excess cancer risk to 1E-6 and 9.80E-7, respectively. For the SWMU 8 and 58 Combination Area, the COCs detected in samples from 1995 through 2006 that contribute to the overall risk and the UCLs of the mean concentrations calculated for these COCs are as follows:

- Arsenic, 9.37 mg/kg (below background and eliminated from further evaluation)
- Barium, 158 mg/kg (below background and eliminated from further evaluation)
- Beryllium, 2.30 mg/kg
- Cadmium, 0.62 mg/kg (below background and eliminated from further evaluation)
- Copper, 51.2 mg/kg
- Nickel, 65.5 mg/kg (revised to include the 2006 sampling)
- Selenium, 6.65 mg/kg
- Silver, 2.74 mg/kg
- Benzo(a)pyrene, 0.12 mg/kg
- Hexahydro-1,3,5-trinitro-1,3,5-triazine, 2.66 mg/kg
- 2,4,6-Trinitrotoluene, 1.59 mg/kg

The UCL values were calculated using only the analytical data from the areas, or sampling events, where the specific risk driver was detected (i.e., areas for which analytical data were 100-percent nondetections for a given COC were not included in the calculation). This approach is conservative because the calculation data set is not “diluted” by the inclusion of a significant number of nondetections from areas of SWMUs 8 and 58 where the specific COC is not present. Consequently, the UCL concentrations listed are higher than those calculated using the entire SWMU 8 and 58 analytical data set. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and estimated incremental excess cancer risks for the industrial land-use scenario are below NMED guidelines.

6.2.2 Combination Area Residential Scenario

Using conservative assumptions and an RME approach to risk assessment, calculations for the nonradiological COCs show that for the residential land-use scenario the HI (11.43) is above the accepted numerical guidance from the EPA (EPA 1989) (Table 6-2). The estimated excess cancer risk is 4E-4. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for a residential land-use scenario (Bearzi January 2001). The incremental HI is 10.88 and the incremental excess cancer risk is 3.37E-4 for the residential land-use scenario. The incremental risk calculations indicate potential risk to human health for the residential land-use scenario.

Although both the HI and estimated excess cancer risk values are above the NMED guidelines for the residential land-use scenario, maximum concentrations were used in the risk calculation. Because the site has been adequately characterized, average concentrations are more representative of actual site conditions. Using the UCLs of the mean concentrations (revised to

include the 2006 data) for the main contributors to excess cancer risk and hazards (summarized in Annex B) reduces the total HI and estimated excess cancer risk to 0.24 and 3E-6, respectively. The incremental HI and excess cancer risk are reduced to 0.22 and 3.28E-6, respectively. The COCs for the SWMU 8 and 58 Combination Area that contribute to the overall risk and hazards and the UCLs of the mean concentrations calculated for these COCs are the bulleted items listed in Section 6.2.1. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and the estimated incremental excess cancer risk values for the residential land-use scenario are below NMED guidelines.

7.0 RECOMMENDATION FOR CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS DETERMINATION

Based upon the SWMU 8 and 58 field investigation data and the corresponding human health risk assessment (revised herein to incorporate the 2006 lead and nickel data) and ecological risk assessment (presented in the April 2005 CAC [SNL/NM April 2005]), a risk-based determination of CAC without controls is again recommended for SWMU 58, Feature 58FF, and for SWMUs 8 and 58 as a whole, for the following reasons:

- The soil has been sampled for all potential COCs.
- No COCs are present in the soil at levels considered hazardous to human health for either an industrial or residential land-use scenario.
- None of the COCs warrant ecological concern because the ecological risks are acceptable based upon NMED guidance.

This is consistent with the NMED's No Further Action Criterion 5, which states, "the SWMU/AOC [Area of Concern] has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use" (NMED March 1998).

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8.0 REFERENCES

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ANNEX A
SWMU 58, Feature 58FF, Fire Brick Area
Soil Sample Data Validation Report, September 2006

Site: Foothills Site 58 **AR/COC:** 610763, 610764, 610765, 610766, 610767 **Data Type:** Inorganic

	ICP metals	7440-02-0 (Nickel)															
082459-003 58FF-GR-EB-2		UJ,B3															
082493-003 58FF-GR-EB-1		UJ,B3															

Validated By: Kevin A Lambert **Date:** 11/02/06

Kevin A. Lambert

Analytical Quality Associates, Inc.
616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

Memorandum - Revised

Date: November 22, 2006

To: File

From: Kevin Lambert/M. Hilchey (revision)

Subject: Inorganic Data Review and Validation – SNL
Site: Foothills Site 58
AR/COC: 610763, 610764, 610765, 610766, and 610767
SDG: 172183, 172185, 172187, 172188, 172192, and 173426
Laboratory: GEL
Project/Task: 98051.02.02.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA6010B (Inductively Coupled Plasma (ICP) metals). Problems were identified with the data package that result in the qualification of data.

1. ICP metals:
   The following target analytes were detected (≥ detection limit (DL)) in one or more of the blanks (initial calibration blank (ICB), continuing calibration blank (CCB) at negative concentration with absolute value > the DL but < the reporting limit (RL). The associated sample results are qualified as noted below.

   Samples 173426-001, 173426-002 — Nickel (Ni) was non-detect and should be qualified "UJ, B3."

Data are acceptable and reported quality control (QC) measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

The initial and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

ICP metals:
Lead (Pb) and Ni were detected (≥ DL) in one or more of the blanks (ICB, CCB, method blank (MB), equipment blank (EB). The associated sample results were detects >5X the blank concentrations; no data should be qualified as a result.

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD met QC acceptance criteria except as follows.

ICP metals:
It should be noted that no LCSD was provided with the SDG except for EBs. No data should be qualified as a result. Laboratory precision for field samples was assessed using the MS/MSD.

Matrix Spike (MS)

The MS met QC acceptance criteria except as follows.

ICP metals:
MS/MSD pairs were analyzed to provide precision data for the field samples. Also, it should be noted that no MS/MSD pair was provided for the EBs. Laboratory precision for the EBs was assessed using the LCS/LCSD. No data should be qualified as a result.

Replicate

The replicate met QC acceptance criteria except as follows.

ICP metals:
Since a replicate and MSD were performed for the field samples, two measures of precision were available. The MS/MSD pairs for field samples were used to evaluate Pb and Ni precision. No data should be qualified as a result.

ICP Serial Dilution

The serial dilution met QC acceptance criteria.

ICP Interference Check Sample (ICS)

The ICS data met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No dilutions were required except as follows.

ICP metals:

Samples 172183-006, -007, -008, and -009	5X for Pb due to matrix interference
Samples 172185-007, -009, -011, -013, -014, -015, -016, and -017	
Samples 172187-006, -007, -008, -009, -011, -012, -013, -014, -015, -016, and –017	

Samples 172188-001, -002, -003, -004, -005, -006, -007, -008, -010, -011, -012, -013, -015, -016, and –017 Samples 172192-009, -012, -013, -014, -016, and -017	
Samples 172183-012, -013, -014, -015, -017, and -018	5X for Ni and Pb due to matrix interference

Other QC

No (EB), trip blank (TB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

ICP metals:
EBs and field duplicate pairs were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data should be qualified as a result.

No other specific issues were identified which affect data quality.

Data Validation Summary

Site/Project: Foothills Site 58 Project/Task #: 98051.02.02.06 # of Samples: 88 Matrix: 2 aqueous, 86 soil

AR/COC #: 610763, 610764, 610765, 610766, 610767 Laboratory Sample IDs: 172183-001 to -018; 172185-001 to -017; 172187-001 to -017; 172188-001 to -017; 172192-001 to -017; 173426-001, -002

Laboratory: GEL

SDG #: 172183, 172185, 172187, 172188, 172192, 173246

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation					✓					
2. Calibrations					✓					
3. Method Blanks					✓					
4. MS/MSD					✓					
5. Laboratory Control Samples					✓					
6. Replicates					NA					
7. Surrogates										
8. Internal Standards										
9. TCL Compound Identification										
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries										
13. Other QC EBs, FDups					UJ					

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable
Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: Kevin A Lambert Date: 11-02-06

Inorganic Metals

Site/Project: Foothills Site 58 AR/COC #: 610764, 610766 Laboratory Sample IDs: 173426-001, -002 (EBs)

Laboratory: GEL SDG #: 173426 ~~-001, -002~~ KAL

Methods: EPA6010B (ICP-metals)

# of Samples: 2 Matrix: aqueous Batch #s: 576818/576819

CAS #/ Analyte	QC Element																		5xDL	
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	~~Field Blanks~~ KAL		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu											Not									
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	-0.00135J	✓	✓	✓	✓	✓		Provided			✓	✓			0.005		
7440-09-7 K																				
7440-22-4 Ag																				
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓			✓		
7782-49-2 Se																				
7440-38-2 As																				
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments:

Reviewed By: Kevin A Lambert Date: 11-02-06

Inorganic Metals

Site/Project: Foothills Site 58 AR/COC #: 610763 Laboratory Sample IDs: 172183-001 to -018

Laboratory: GEL SDG #: 172183

Methods: EPA6010B (ICP metals)

# of Samples: 18 Matrix: Soil Batch #s: 571009

CAS #/ Analyte	QC Element																		5x
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	~~Field~~ Blanks KAL	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni	✓	✓	✓	✓	✓	0.101J	✓	NA	NA	✓	✓	✓	54(20)	✓	✓	3.9	✓	0.505	
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	4.9	✓	NA	
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg																			
Cyanide CN																			

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments:

Reviewed By: Kevin A Lambert Date: 11-02-06

Inorganic Metals

Site/Project: Foothills Site 58 AR/COC #: 610764 Laboratory Sample IDs: 172185-001 to -017

Laboratory: GEL SDG #: 172185

Methods: EPA 601013 (ICP metals)

# of Samples: 17 Matrix: Soil Batch #s: 571011

CAS #/ Analyte	QC Element																	5X KM	
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	~~Field~~ Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg						KAL													
7439-96-5 Mn						~~0.1355J~~													
7440-02-0 Ni	✓	✓	✓	✓	✓	0.1355	✓	NA	NA	✓	✓	✓	✓	✓	✓	33	✓	0.68	
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	1.6	✓	NA	
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg																			
Cyanide CN																			

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments:

Reviewed By: Kevin A Lambert Date: 11-02-06

Inorganic Metals

Site/Project: Foothills Site 58 AR/COC #: 610765 Laboratory Sample IDs: 172187-001 to -017

Laboratory: GEL SDG #: 172187

Methods: EPA6010B (ICP metals)

# of Samples: 17 Matrix: Soil Batch #s: 571013

CAS #/ Analyte	QC Element																		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	1.7	✓		
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	1.3	✓		
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg																			
Cyanide CN																			

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments:

Reviewed By: Kevin A Lambert Date: 11-02-06

Inorganic Metals

Site/Project: Foothills Site 58 AR/COC #: 610766 Laboratory Sample IDs: 172188-001 to -017

Laboratory: GEL SDG #: 172188

Methods: EPA6010B (ICP metals)

# of Samples: 17 Matrix: soil Batch #s: 571015

CAS #/ Analyte	QC Element																		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	Field Blanks	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	17	✓		
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	15	✓		
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg																			
Cyanide CN																			

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments:

Reviewed By: Kevin A Lambert Date: 11-02-06

Inorganic Metals

Site/Project: Foothills Site 58 AR/COC #: 610767 Laboratory Sample IDs: 172192-001 to -017

Laboratory: GEL SDG #: 172192

Methods: EPA6010B (ICP metals)

# of Samples: 17 Matrix: Soil Batch #s: 571017

CAS #/ Analyte	QC Element																		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu-tion	Field Dup. RPD	Equip. Blanks	~~Field~~ 5X Blanks KAL	
7429-90-5 Al																			
7440-39-3 Ba																			
7440-41-7 Be																			
7440-43-9 Cd																			
7440-70-2 Ca																			
7440-47-3 Cr																			
7440-48-4 Co																			
7440-50-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-5 Mn																			
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	4.7	✓	NA	
7440-09-7 K																			
7440-22-4 Ag																			
7440-23-5 Na																			
7440-62-2 V																			
7440-66-6 Zn																			
	✓	✓	✓	✓	0.00273J	✓	✓	NA	NA	✓	✓	✓	✓	✓	✓	21	✓	0.014	
7439-92-1 Pb																			
7782-49-2 Se																			
7440-38-2 As																			
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-97-6 Hg																			
Cyanide CN																			

Notes: Shaded rows are RCRA metals. **Solids-to-aqueous conversion:** mg / kg = µg / g : [(µg / g) x (sample mass {g} / sample vol. {ml}) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Comments:

Reviewed By: Kevin A Lambert Date: 11-02-06

Contract Verification Review (CVR)

Project Leader Langkopf | Project Name Foothills Site 58 | Case No. 98051_02.02.06

AR/COC No. 610763, 610764, 610765, 610766, 610767 | Analytical Lab GEL | SDG No. 172183

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct		X	082468-003 listed as 082468-006 in the Case Narrative		
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples		X	DUP RPD failed for Nickel due to non-homogeneity of sample (Batch #571009)
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	Nickel detected in Method Blank (Batch #571009, #571011)
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	N/A		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
082468-003	Lead & Nickel	082468-003 listed as 082468-006 in the Case Narrative, COA (page 87), Metals Fractional Narrative (page 242)
082459-003, 082493-003	Lead & Nickel	Listed twice in Case Narrative

Were deficiencies unresolved? Yes (No)

Based on the review, this data package is complete. (Yes) No

If no, provide: nonconformance report or correction request number 12327 and date correction request was submitted 10/23/06

Reviewed by: [signature] Date: 10/23/06 Closed by: [signature] Date: 11.02.06

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use 98051 ✓ AR/COC **610763**

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-19-06	Project/Task No.: ~~7218.02.02.05~~ 02.02.66	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	68917	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	SWMU 58 ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code	EV/332/58/DAT	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.	ER 97	SMO Contact/Phone:	Pam Puissant/505-284-3124	SEE BOTTLE ORDER	☑ Validation Required
Service Order No.	CFO55-06 07 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area				
Building	Room	Reference LOV(available at SMO) 172183			

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 082426-003	58FF-GR-BH14-0-S	0	58	091306/1356	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	001
✓ 082427-003	58FF-GR-BH14-2-S	2	58	091406/1042	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	002
✓ 082428-003	58FF-GR-BH14-4-S	4	58	091406/1044	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	003
✓ 082429-003	58FF-GR-BH14-6-S	6	58	091406/1046	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	004 ~~004~~ KAL
✓ 082429-013	58FF-GR-BH14-6-DU	6	58	091406/1046	soil	P	250 ml	None	G	DU	Lead and Nickel 3050B/6010B	005 ~~006~~ KAL
✓ 082430-003	58FF-GR-BH14-8-S	8	58	091406/1049	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	006 ~~007~~ KAL
✓ 082431-003	58FF-GR-BH14-10-S	10	58	091406/1055	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	007 ~~008~~ KAL
✓ 082432-003	58FF-GR-BH14-12-S	12	58	091406/1059	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	008 ~~009~~ KAL
✓ 082433-003	58FF-GR-BH14-14-S	14	58	091406/1101	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	009 ~~010~~ KAL
✓ 082434-003	58FF-GR-BH14-16-S	16	58	091406/1104	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	010
✓ 082435-003	58FF-GR-BH14-18-S	18	58	091406/1106	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	011

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	09/20/06
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	RL
Return Samples By:	☐ Negotiated TAT	QC inits.	WP

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson		WG	Weston/6146/284-5232/23907367
	Robert Lynch		RL	Weston/6146/250-7090
	Mike Sanders		MS	Gram/6146/284-2478
	~~Gilbert Quintana~~			~~Shaw/6146/850-8524~~

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☑ Yes ☐ No

*Send report to:

Brenda Langkopf/Org 6146/MS1087/505-284-3272

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

1.Relinquished by		Org. 6146	Date 9-19-06	Time 0930	4.Relinquished by	Org.	Date Time
1. Received by		Org. 6146	Date 9-19-06	Time 0930	4. Received by	Org.	Date Time
2.Relinquished by		Org. 6146	Date 9-19-06	Time 1230	5.Relinquished by	Org.	Date Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 610763

172183
Lab use

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf	Project/Task No.:	98051-.02.02.06
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓082436-003	58FF-GR-BH14-20-S	20	58	091406/1111	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	012
✓082436-013	58FF-GR-BH14-20-DU	20	58	091406/1111	soil	P	250 ml	None	G	DU	Lead and Nickel 3050B/6010B	013
✓082437-003	58FF-GR-BH14-22-S	22	58	091406/1113	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	014
✓082438-003	58FF-GR-BH14-24-S	24	58	091406/1118	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	015
✓082439-003	58FF-GR-BH14-26-S	26	58	091406/1120	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	016
✓082440-003	58FF-GR-BH14-28-S	28	58	091406/1122	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	017
✓082441-003	58FF-GR-BH14-30-S	30	58	091406/1126	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	018

Abnormal Conditions on Receipt

LAB USE

Recipient Initials_____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

Batch No. 114

SMO Use

AR/COC 610764

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-19-06	Project/Task No.:	98051.02.02.06 ✓
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	68917	SMO Authorization:	✓ Smo
Project Name:	SWMU 58 ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		SEE BOTTLE ORDER
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No.	CFO55-06 07 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		
Location	Tech Area				
Building	Room				

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:_____
☑ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154
172185

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 082443-001	58FF-GR-BH15-0-S	0	58	091306/1400	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	001
✓ 082444-002	58FF-GR-BH15-2-S	2	58	091406/1649	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	002
✓ 082445-003	58FF-GR-BH15-4-S	4	58	091406/1651	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	003
✓ 082446-003	58FF-GR-BH15-6-S	6	58	091406/1656	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	004
✓ 082447-003	58FF-GR-BH15-8-S	8	58	091406/1658	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	005
✓ 082448-003	58FF-GR-BH15-10-S	10	58	091406/1704	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	006
✓ 082449-003	58FF-GR-BH15-12-S	12	58	091406/1709	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	007
✓ 082450-003	58FF-GR-BH15-14-S	14	58	091406/1711	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	008
✓ 082451-003	58FF-GR-BH15-16-S	16	58	091406/1715	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	009
✓ 082452-003	58FF-GR-BH15-18-S	18	58	091406/1717	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	010
✓ 082453-003	58FF-GR-BH15-20-S	20	58	091406/1721	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Dispose ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy) 09/20/06
Entered by: RC
QC Inits. WP

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members

Name	Signature	Init	Company/Organization/Phone/Cellular
William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090
Mike Sanders	Mike Sanders	MS	Gram/6146/284-2478
Gil Quintana			Shaw/6146/850-8524

1.Relinquished by	William Gibson	Org.	6146	Date	9-19-06	Time	0930	4.Relinquished by	Org.	Date	Time
1. Received by	Roy & Sam SMO	Org.	6146	Date	9-19-06	Time	0930	4. Received by	Org.	Date	Time
2.Relinquished by	Roy & Sam SMO	Org.	6146	Date	9-19-06	Time	1230	5.Relinquished by	Org.	Date	Time
2. Received by		Org.		Date		Time		5. Received by	Org.	Date	Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 610764

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf	Project/Task No.:	98051 .02.02.06
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

172185 Lab use

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓082454-003	58FF-GR-BH15-22-S	22	58	091406/1723	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	012
✓082455-003	58FF-GR-BH15-24-S	24	58	091406/1727	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	013
✓082456-003	58FF-GR-BH15-26-S	26	58	091406/1729	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	014
✓082457-003	58FF-GR-BH15-28-S	28	58	091406/1731	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	015
✓082457-013	58FF-GR-BH15-28-DU	28	58	091406/1731	soil	P	250 ml	None	G	DU	Lead and Nickel 3050B/6010B	016
✓082458-003	58FF-GR-BH15-30-S	30	58	091406/1735	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	017
✓082459-003	58FF-GR-EB-2	NA	58	091406/1555	DIW	P	500 ml	HNO3	C ✓	EB	Lead and Nickel 3050B/6010B	173426-001

Abnormal Conditions on Receipt

LAB USE

Recipient Initials_____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

Batch No. N/A

SMO Use

AR/COC 610765

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-19-06	Project/Task No.: 98051.02.02.06	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf	Carrier/Waybill No.	68917	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	SWMU 58 FOOTHILLS	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	☐ Released by COC No.:
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☑ Validation Required
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		Bill To: Sandia National Labs (Accounts Payable)
Service Order No.	CFO55-06 07	Send Report to SMO:	Lorraine Herrera/505-844-3199		P.O. Box 5800 MS 0154 172187
Location	Tech Area				Albuquerque, NM 87185-0154
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
082460-003	58FF-GR-BH16-0-S	0	58	091306/1403	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	001
082461-003	58FF-GR-BH16-2-S	2	58	091406/0803	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	002
082462-003	58FF-GR-BH16-4-S	4	58	091406/0805	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	003
082463-003	58FF-GR-BH16-6-S	6	58	091406/0809	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	004
082464-003	58FF-GR-BH16-8-S	8	58	091406/0812	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	005
082465-003	58FF-GR-BH16-10-S	10	58	091406/0816	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	006
082466-003	58FF-GR-BH16-12-S	12	58	091406/0821	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	007
082467-003	58FF-GR-BH16-14-S	14	58	091406/0824	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	008
082468-003	58FF-GR-BH16-16-S	16	58	091406/0827	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	009
082469-003	58FF-GR-BH16-18-S	18	58	091406/0828	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	010
082470-003	58FF-GR-BH16-20-S	20	58	091406/0833	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	011

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	09/20/06
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	RL
Return Samples By:	☐ Negotiated TAT	QC Inits.	WP

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson			Weston/6146/284-5232/23907367
	Robert Lynch			Weston/6146/250-7090
	Mike Sanders			Gram/6146/284-2478
	~~Gilbert Quintana~~			~~Shaw/6146/850-8524~~

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☑ Yes ☐ No

*Send report to:

Brenda Langkopf/Org 6146/MS1087/505-284-3272

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

1.Relinquished by	William Gibson	Org.	6146	Date	9-19-06	Time	0930	
1. Received by	[illegible]	Org.	6146	Date	9-19-06	Time	0930	
2.Relinquished by	[illegible]	Org.	6146	Date	9-19-06	Time	1230	
2. Received by		Org.		Date		Time		
3.Relinquished by		Org.		Date		Time		
3. Received by		Org.		Date		Time		

4.Relinquished by	Org.	Date	Time
4. Received by	Org.	Date	Time
5.Relinquished by	Org.	Date	Time
5. Received by	Org.	Date	Time
6.Relinquished by	Org.	Date	Time
6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 610765

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf	Project/Task No.:	98051.02.02.06
Location	Tech Area				
Building	Room				

172187 Lab use

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 082471-003	58FF-GR-BH16-22-S	22	58	091406/0836	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	012
✓ 082472-003	58FF-GR-BH16-24-S	24	58	091406/0838	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	013
✓ 082473-003	58FF-GR-BH16-26-S	26	58	091406/0842	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	014
✓ 082474-003	58FF-GR-BH16-28-S	28	58	091406/0845	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	015
✓ 082474-013	58FF-GR-BH16-28-DU	28	58	091406/0845	soil	P	250 ml	None	G	DU	Lead and Nickel 3050B/6010B	016
✓ 082475-003	58FF-GR-BH16-30-S	30	58	091406/0849	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	017

Abnormal Conditions on Receipt

LAB USE

Recipient Initials_____

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. 1-117

SMO Use

AR/COC **610766**

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-19-06	Project/Task No.: 98051.02.02.06 ✓	☐ Waste Characterization
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	68917	SMO Authorization: 09 Dan Swa	-Send preliminary/copy report to:
Project Name:	SWMU 58 ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL	SEE BOTTOM	☐ Released by COC No.:
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		☑ Validation Required
Service Order No.	CFO55-06-07 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 172188

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 082477-003	58FF-GR-BH17-0-S	0	58	091306/1405	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	001
✓ 082478-003	58FF-GR-BH17-2-S	2	58	091306/1609	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	002
✓ 082479-003	58FF-GR-BH17-4-S	4	58	091306/1615	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	003
✓ 082480-003	58FF-GR-BH17-6-S	6	58	091306/1619	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	004
✓ 082481-003	58FF-GR-BH17-8-S	8	58	091306/1623	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	005
✓ 082482-003	58FF-GR-BH17-10-S	10	58	091306/1630	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	006
✓ 082483-003	58FF-GR-BH17-12-S	12	58	091306/1635	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	007
✓ 082484-003	58FF-GR-BH17-14-S	14	58	091306/1638	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	008
✓ 082485-003	58FF-GR-BH17-16-S	16	58	091306/1642	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	009
✓ 082486-003	58FF-GR-BH17-18-S	18	58	091306/1645	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	010
✓ 082487-003	58FF-GR-BH17-20-S	20	58	091306/1648	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking Smo Use

Date Entered(mm/dd/yy) 09/20/06

Entered by: NKL

QC Inits. WP

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☑ Yes ☐ No

*Send report to:

Brenda Langkopf/Org 6146/MS1087/505-284-3272

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William Gibson	William Gibson	WG	Weston/6146/284-5232/23907367
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090
	Mike Sanders	Mike Sanders	MS	Gram/6146/284-2478
	~~Gilbert Quintana~~			~~Shaw/6146/850-8524~~

*Please list as separate report.

1.Relinquished by	William Gibson	Org. 6146	Date 9-19-06	Time 0930	4.Relinquished by	Org.	Date	Time
1. Received by	Robert Lynch Swa	Org. 6146	Date 9-19-06	Time 0930	4. Received by	Org.	Date	Time
2.Relinquished by	Robert Lynch Swa	Org. 6146	Date 9-19-06	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 610766

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf	Project/Task No.:	98051.02.02.06
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

172188 Lab use

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓082488-003	58FF-GR-BH17-22-S	22	58	091306/1652	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	012
✓082489-003	58FF-GR-BH17-24-S	24	58	091306/1656	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	013
✓082490-003	58FF-GR-BH17-26-S	26	58	091306/1659	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	014
✓082491-003	58FF-GR-BH17-28-S	28	58	091306/1702	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	015
✓082491-013	58FF-GR-BH17-28-DU	28	58	091306/1702	soil	P	250 ml	None	G	DU	Lead and Nickel 3050B/6010B	016
✓082492-003	58FF-GR-BH17-30-S	30	58	091306/1705	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	017
✓082493-003	58FF-GR-EB-1	NA	58	091306/1712	DIW	P	500 ml	HNO3	C	EB	Lead and Nickel 3050B/6010B	173426-002

Abnormal Conditions on Receipt

LAB USE

Recipient Initials__ __

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC **610767**

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-19-06	Project/Task No.:	98051.02.02.06 ✓
Project/Task Manager:	Brenda Langkopf ✓	Carrier/Waybill No.	68917	SMO Authorization:	By Fax Email
Project Name:	SWMU 58 ✓	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671
Record Center Code:	ER/1332/58/DAT	Lab Destination:	GEL		500 BOTTLE ORDER
Logbook Ref. No.:	ER097	SMO Contact/Phone:	Pam Puissant/505-284-3124		
Service Order No.	CFO55-06 07 ✓	Send Report to SMO:	Lorraine Herrera/505-844-3199		
Location	Tech Area				
Building	Room				

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:_____
☑ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154 172192

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Sample Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 082494-003	58FF-GR-BH18-0-S	0	58	091306/1408	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	001
✓ 082495-003	58FF-GR-BH18-2-S	2	58	091406/1439	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	002
✓ 082496-003	58FF-GR-BH18-4-S	4	58	091406/1443	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	003
✓ 082497-003	58FF-GR-BH18-6-S	6	58	091406/1445	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	004
✓ 082498-003	58FF-GR-BH18-8-S	8	58	091406/1447	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	005
✓ 082499-003	58FF-GR-BH18-10-S	10	58	091406/1500	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	006
✓ 082499-013	58FF-GR-BH18-10-DU	10	58	091406/1500	soil	P	250 ml	None	G	DU	Lead and Nickel 3050B/6010B	007
✓ 082500-003	58FF-GR-BH18-12-S	12	58	091406/1503	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	008
✓ 082501-003	58FF-GR-BH18-14-S	14	58	091406/1505	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	009
✓ 082502-003	58FF-GR-BH18-16-S	16	58	091406/1507	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	010
✓ 082503-003	58FF-GR-BH18-18-S	18	58	091406/1509	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking Smo Use
Date Entered(mm/dd/yy) 09/20/06
Entered by: RL
QC inits. WP

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☑ Yes ☐ No
*Send report to:
Brenda Langkopf/Org 6146/MS1087/505-284-3272

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	init	Company/Organization/Phone/Cellular
WJP	William Gibson	William Gibson	WJP	Weston/6146/284-5232/23907367
	Robert Lynch	Robert Lynch	RL	Weston/6146/250-7090
	Mike Sanders	Mike Sanders	MS	Gram/6146/284-2478
	Gilbert Quintana			~~Shaw/6146/859-8524~~

*Please list as separate report.

1.Relinquished by	William Gibson	Org. 6146	Date 9-19-06	Time 0930	4.Relinquished by	Org.	Date	Time
1. Received by	Robert Lynch	Org. 6146	Date 9-19-06	Time 0930	4. Received by	Org.	Date	Time
2.Relinquished by	Robert Lynch	Org. 6146	Date 9-19-06	Time 1230	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 610767

Project Name:	SWMU 58	Project/Task Manger:	Brenda Langkopf	Project/Task No.:	98051.02.02.06
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

172192 Lab use

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 082504-003	58FF-GR-BH18-20-S	20	58	091406/1511	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	012
✓ 082505-003	58FF-GR-BH18-22-S	22	58	091406/1513	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	013
✓ 082506-003	58FF-GR-BH18-24-S	24	58	091406/1516	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	014
✓ 082507-003	58FF-GR-BH18-26-S	26	58	091406/1518	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	015
✓ 082508-003	58FF-GR-BH18-28-S	28	58	091406/1520	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	016
✓ 082509-003	58FF-GR-BH18-30-S	30	58	091406/1522	soil	P	250 ml	None	G	SA	Lead and Nickel 3050B/6010B	017

Abnormal Conditions on Receipt

LAB USE

Recipient Initials_____

RECORDS CENTER CODE: ER/1332/58/DAT

SMO ANALYTICAL DATA ROUTING FORM

PROJECT NAME: Foothills Site 58 PROJECT/TASK: 98051_02.02.06

SNL TASK LEADER: Langkopf ORG/MS/CF0#: 6146/1087/CF055-07

SMO PROJECT LEAD: Herrera SAMPLE SHIP DATE: 9/19/2006

ARCOC	LAB	LAB ID	PRELIM DATE	FINAL DATE	EDD	EDD ON Q	Cust CD	RC CD
610763	GEL	172183		10/19/2006	X	X	N/A	X
610764	GEL	172183		10/19/2006	X	X	N/A	X
610765	GEL	172183		10/19/2006	X	X	N/A	X
610766	GEL	172183		10/19/2006	X	X	N/A	X
610767	GEL	172183		10/19/2006	X	X	N/A	X

DATA PACKAGE TAT:		RUSH	X	NORMAL
CORRECTIONS REQUESTED BY/DATE:		L. Herrera		31 10-23-06
PROBLEM #/DATE CORRECTION RECEIVED:		12327		
CVR COMPLETED BY/DATE:		L. Herrera		10-23-06
FINAL TRANSMITTED TO/DATE:		B. Langkopf		10-23-06
SENT TO VALIDATION BY/DATE:		R. Kavanaugh		11-01-06
REVISIONS REQUESTED/REVISIONS RECEIVED (DATE):				
VALIDATION COMPLETED BY/DATE:		KAL		11-02-06
CD RECEIVED BY/DATE		R. Kavanaugh		10/19/2006
TO ERDMS BY/DATE:				
TO RECORDS CENTER BY/DATE:				

COMMENTS:

ANNEX B
SWMU 58, Feature 58FF, and SWMU 8 and 58 Combination Area
Calculation of the Upper Confidence Limits of Mean Concentrations

CALCULATION OF THE UPPER CONFIDENCE LIMITS OF MEAN CONCENTRATIONS

For conservatism, Sandia National Laboratories/New Mexico uses the maximum concentration of the COCs for initial risk calculation. If the maximum concentrations produce risk above NMED guidelines, conservatism with this approach is evaluated and, if appropriate, a more realistic approach is applied. When the site has been adequately characterized, an estimate of the mean concentration of the COCs is more representative of actual site conditions. The NMED has proposed the use of the 95, 97.5, or 99% UCL of the mean (depending upon the variants of the data set) to represent average concentrations at a site (NMED December 2000). The UCL is calculated according to NMED guidance (Tharp June 2002) using the U.S. Environmental Protection Agency ProUCL program (EPA April 2002). Attached are the outputs from that program and the calculated UCLs used in the risk analysis.

References

EPA, see U.S. Environmental Protection Agency.

New Mexico Environment Department (NMED), December 2000. "Technical Background Document for Development of Soil Screening Levels," Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico. December 18, 2000.

NMED, see New Mexico Environment Department.

Tharp, T. (Weston Solutions, Inc.), June 2002. *Personal communication* with K. Olsen (Hazardous Waste Bureau, New Mexico Environment Department). June 12, 2002.

U.S. Environmental Protection Agency (EPA), April 2002. *ProUCL User's Guide*, U.S. Environmental Protection Agency, Washington, D.C.

SWMU 58, Feature 58FF, Fire Brick Area

Fire Brick Area (58FF) - Human Health	
Summary Statistics for	Arsenic
Number of Samples	124
Minimum	0.0106
Maximum	103.0000
Mean	5.5793
Median	2.9950
Standard Deviation	10.0319
Variance	100.6397
Coefficient of Variation	1.7981
Skewness	7.7677
Lilliefors Test Statistic	0.241736
Lilliefors 5% Critical Value	0.079565
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	7.0724
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	7.7327
Modified-t	7.1772
95	% Non-parametric UCL
CLT	7.0612
Jackknife	7.0724
Standard Bootstrap	7.0711
Bootstrap-t	8.5391
Chebyshev (Mean, Std)	9.5062

Fire Brick Area (58FF) - Human Health	
Summary Statistics for	Beryllium
Number of Samples	124
Minimum	0.139
Maximum	79.300
Mean	2.249
Median	0.497
Standard Deviation	9.260
Variance	85.753
Coefficient of Variation	4.118
Skewness	6.741
Lilliefors Test Statistic	0.226818
Lilliefors 5% Critical Value	0.079565
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	3.627
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	4.154
Modified-t	3.711
95	% Non-parametric UCL
CLT	3.616
Jackknife	3.627
Standard Bootstrap	3.612
Bootstrap-t	5.969
Chebyshev (Mean, Std)	5.873

Fire Brick Area (58FF) - Human Health	
Summary Statistics for	Lead
Number of Samples	186
Minimum	0.61
Maximum	15000
Mean	154.9
Median	7.4
Standard Deviation	1255
Variance	1573833
Coefficient of Variation	8.10
Skewness	10.1
Lilliefors Test Statistic	0.261
Lilliefors 5% Critical Value	0.065
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)	
Student's-t	307.0
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	379.2
Modified-t	318.4
95 % Non-parametric UCL	
CLT	306.2
Jackknife	307.0
Standard Bootstrap	301.5
Bootstrap-t	506.5
Chebyshev (Mean, Std)	555.9

Fire Brick Area (58FF) - Human Health	
Summary Statistics for	Nickel
Number of Samples	186
Minimum	1.87
Maximum	3960
Mean	41.0
Median	10.6
Standard Deviation	295.2
Variance	87165
Coefficient of Variation	7.21
Skewness	12.9
Lilliefors Test Statistic	0.229
Lilliefors 5% Critical Value	0.065
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)	
Student's-t	76.7
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	98.4
Modified-t	80.1
95 % Non-parametric UCL	
CLT	76.6
Jackknife	76.7
Standard Bootstrap	76.9
Bootstrap-t	506.1
Chebyshev (Mean, Std)	135.3

SWMU 8 and 58 Combination Area

Combination Area - Human Health	
Summary Statistics for	Arsenic
Number of Samples	360
Minimum	0.01
Maximum	137
Mean	6.43
Median	3.23
Standard Deviation	12.76
Variance	162.89
Coefficient of Variation	1.98
Skewness	7.02
Lilliefors Test Statistic	0.148747
Lilliefors 5% Critical Value	0.046696
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)	
Student's-t	7.54
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	7.81
Modified-t	7.58
95 % Non-parametric UCL	
CLT	7.54
Jackknife	7.54
Standard Bootstrap	7.55
Bootstrap-t	7.97
Chebyshev (Mean, Std)	9.37

Combination Area - Human Health	
Summary Statistics for	Barium
Number of Samples	327
Minimum	1.53
Maximum	988
Mean	132.21
Median	110
Standard Deviation	105.73
Variance	11178
Coefficient of Variation	0.80
Skewness	3.01
Lilliefors Test Statistic	0.096
Lilliefors 5% Critical Value	0.049
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	141.86
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	142.87
Modified-t	142.02
95	% Non-parametric UCL
CLT	141.83
Jackknife	141.86
Standard Bootstrap	141.91
Bootstrap-t	143.76
Chebyshev (Mean, Std)	157.70

Combination Area - Human Health	
Summary Statistics for	Beryllium
Number of Samples	360
Minimum	0.055
Maximum	79.30
Mean	1.04
Median	0.42
Standard Deviation	5.50
Variance	30.20
Coefficient of Variation	5.29
Skewness	11.58
Lilliefors Test Statistic	0.156
Lilliefors 5% Critical Value	0.047
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	1.52
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	1.70
Modified-t	1.55
95	% Non-parametric UCL
CLT	1.52
Jackknife	1.52
Standard Bootstrap	1.51
Bootstrap-t	2.19
Chebyshev (Mean, Std)	2.30

Combination Area - Human Health	
Summary Statistics for	Cadmium
Number of Samples	330
Minimum	0.0025
Maximum	6.020
Mean	0.431
Median	0.172
Standard Deviation	0.765
Variance	0.585
Coefficient of Variation	1.774
Skewness	4.987
Lilliefors Test Statistic	0.137
Lilliefors 5% Critical Value	0.049
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)	
Student's-t	0.501
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	0.513
Modified-t	0.503
95 % Non-parametric UCL	
CLT	0.500
Jackknife	0.501
Standard Bootstrap	0.499
Bootstrap-t	0.517
Chebyshev (Mean, Std)	0.615

Combination Area - Human Health	
Summary Statistics for	Copper
Number of Samples	240
Minimum	1.64
Maximum	684
Mean	30.03
Median	14.60
Standard Deviation	75.18
Variance	5652
Coefficient of Variation	2.50
Skewness	6.28
Lilliefors Test Statistic	0.16
Lilliefors 5% Critical Value	0.06
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	38.04
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	40.12
Modified-t	38.37
95	% Non-parametric UCL
CLT	38.01
Jackknife	38.04
Standard Bootstrap	38.12
Bootstrap-t	42.10
Chebyshev (Mean, Std)	51.18

Combination Area - Human Health	
Summary Statistics for	Lead
Number of Samples	455
Minimum	0.075
Maximum	15000
Mean	75.3
Median	7.96
Standard Deviation	802
Variance	643424
Coefficient of Variation	10.7
Skewness	15.7
Lilliefors Test Statistic	0.163
Lilliefors 5% Critical Value	0.042
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	137
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	167
Modified-t	142
95	% Non-parametric UCL
CLT	137
Jackknife	137
Standard Bootstrap	138
Bootstrap-t	301
Chebyshev (Mean, Std)	239

Combination Area - Human Health	
Summary Statistics for	Nickel
Number of Samples	446
Minimum	1.87
Maximum	3960
Mean	25.3
Median	9.91
Standard Deviation	195
Variance	38027
Coefficient of Variation	7.71
Skewness	18.8
Lilliefors Test Statistic	0.167
Lilliefors 5% Critical Value	0.042
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	40.5
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	49.3
Modified-t	41.9
95	% Non-parametric UCL
CLT	40.5
Jackknife	40.5
Standard Bootstrap	40.4
Bootstrap-t	88.2
Chebyshev (Mean, Std)	65.5

Combination Area - Human Health	
Summary Statistics for	Selenium
Number of Samples	330
Minimum	0.035
Maximum	79
Mean	4.207
Median	0.359
Standard Deviation	10.18
Variance	103.55
Coefficient of Variation	2.419
Skewness	3.170
Lilliefors Test Statistic	0.149
Lilliefors 5% Critical Value	0.049
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)	
Student's-t	5.131
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	5.233
Modified-t	5.147
95 % Non-parametric UCL	
CLT	5.128
Jackknife	5.131
Standard Bootstrap	5.157
Bootstrap-t	5.312
Chebyshev (Mean, Std)	6.649

Combination Area - Human Health	
Summary Statistics for	Silver
Number of Samples	266
Minimum	0.0106
Maximum	60.50
Mean	1.11
Median	0.12
Standard Deviation	6.11
Variance	37.34
Coefficient of Variation	5.53
Skewness	8.49
Lilliefors Test Statistic	0.09
Lilliefors 5% Critical Value	0.05
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	1.72
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	1.93
Modified-t	1.76
95	% Non-parametric UCL
CLT	1.72
Jackknife	1.72
Standard Bootstrap	1.73
Bootstrap-t	2.46
Chebyshev (Mean, Std)	2.74

Combination Area - Human Health	
Summary Statistics for	Benzo(a)pyrene
Number of Samples	21
Minimum	0.081
Maximum	0.235
Mean	0.09
Median	0.08
Standard Deviation	0.03
Variance	0.00
Coefficient of Variation	0.37
Skewness	4.58
Shapiro-Wilk Test Statistic	0.254
Shapiro-Wilk 5% Critical Value	0.908
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)	
Student's-t	0.10
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	0.11
Modified-t	0.10
95 % Non-parametric UCL	
CLT	0.10
Jackknife	0.10
Standard Bootstrap	0.10
Bootstrap-t	0.56
Chebyshev (Mean, Std)	0.12

Combination Area - Human Health	
Summary Statistics for	RDX
Number of Samples	41
Minimum	0.0001
Maximum	19.9
Mean	0.55
Median	0.12
Standard Deviation	3.10
Variance	9.59
Coefficient of Variation	5.58
Skewness	6.40
Shapiro-Wilk Test Statistic	0.799237866
Shapiro-Wilk 5% Critical Value	0.941
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)	
Student's-t	1.37
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	1.87
Modified-t	1.45
95 % Non-parametric UCL	
CLT	1.35
Jackknife	1.37
Standard Bootstrap	1.36
Bootstrap-t	26.31
Chebyshev (Mean, Std)	2.66

Combination Area - Human Health	
Summary Statistics for	TNT
Number of Samples	76
Minimum	9.50E-05
Maximum	20
Mean	0.39
Median	0.00
Standard Deviation	2.40
Variance	5.76
Coefficient of Variation	6.13
Skewness	7.67
Lilliefors Test Statistic	0.371
Lilliefors 5% Critical Value	0.102
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
95	% UCL (Assuming Normal Data)
Student's-t	0.850
95	% UCL (Adjusted for Skewness)
Adjusted-CLT	1.103
Modified-t	0.89
95	% Non-parametric UCL
CLT	0.84
Jackknife	0.85
Standard Bootstrap	0.83
Bootstrap-t	4.24
Chebyshev (Mean, Std)	1.59