



Sandia National Laboratories / New Mexico

**PROPOSAL FOR NO FURTHER ACTION
ENVIRONMENTAL RESTORATION PROJECT
SITE 27, BLDG. 9820 ANIMAL DISPOSAL PIT
OPERABLE UNIT 1332**

FY 1995

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**Environmental
Restoration
Project**



**United States Department of Energy
Albuquerque Operations Office**

**PROPOSAL FOR
NO FURTHER ACTION
Environmental Restoration Project**

**Site 27, Building 9820 Animal Disposal Pit
OU 1332**

Prepared by
Sandia National Laboratories/New Mexico
Environmental Restoration Project
Albuquerque, New Mexico

Prepared for the
United States Department of Energy

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1. Introduction

1.1 ER Site 27, Building 9820

Sandia National Laboratories/New Mexico (SNL/NM) is proposing an administrative no further action (NFA) decision based on confirmatory sampling for Environmental Restoration (ER) Site 27, Building 9820 - Animal Disposal Pit, Operable Unit (OU) 1332. ER Site 27, formerly included in OU 1272, was identified in the Hazardous and Solid Waste Amendment (HSWA) Module IV (Ref. 1) of the SNL/NM Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Facility Permit (NM5890110518) (Ref. 2).

1.2 SNL/NM Administrative NFA Process

This proposal for a determination of a confirmatory sampling NFA decision has been prepared using the criteria presented in Section 4.5.3 of the SNL/NM Program Implementation Plan (Ref. 3). Specifically, this proposal will "contain information demonstrating that there are no releases of hazardous waste (including hazardous constituents) from solid waste management units (SWMU) at the facility that may pose a threat to human health or the environment" (as proposed in the Code of Federal Regulations (CFR) Section 40 Part 264.51[a] [2]) (Ref. 4). The HSWA Module IV contains the same requirements for an NFA demonstration:

Based on the results of the RFI [RCRA Facility Investigation] and other relevant information, the Permittee may submit an application to the Administrative Authority for a Class III permit modification under 40 CFR 270.42(c) to terminate the RFI/CMS [corrective measures study] process for a specific unit. This permit modification application must contain information demonstrating that there are no releases of hazardous waste including hazardous constituents from a particular SWMU at the facility that pose threats to human health and/or the environment, as well as additional information required in 40 CFR 270.42(c) (Ref. 1).

If the available archival evidence is not considered convincing, SNL/NM performs confirmatory sampling to increase the weight of the evidence and allow an informed decision on whether to proceed with the administrative-type NFA or to return to the site characterization program for additional data collection (Ref. 3).

The U.S Environmental Protection Agency (EPA) acknowledged that the extent of sampling required may vary greatly, stating that:

...[T]he agency does not intend this rule (the second codification of HSWA) to require extensive sampling and monitoring at every SWMU...Sampling is generally required only in situations where there is insufficient evidence on which to make an initial release determination...[T]he actual extent of sampling will vary...depending on the amount and quality of existing information available (Ref. 5).

In requesting a confirmatory sampling NFA decision for ER Site 27, Bldg 9820-Animal Disposal Pit, this proposal utilizes existing administrative/archival information, the results of confirmatory sampling, and survey data to satisfy the permit requirements. This unit is eligible for an administrative NFA proposal based on one or more of the following criteria taken from the RCRA Facility Assessment (RFA) Guidance (Ref. 6):

- Criterion A: The unit has never contained constituents of concern (COCs).
- Criterion B: The unit has design and/or operating characteristics that effectively prevent releases to the environment.
- Criterion C: The unit clearly has not released hazardous waste or constituents into the environment.

Specifically, ER Site 27 is being proposed for a confirmatory sampling NFA decision because the SWMU never contained hazardous waste or constituents (Criterion A).

1.3 Local Setting

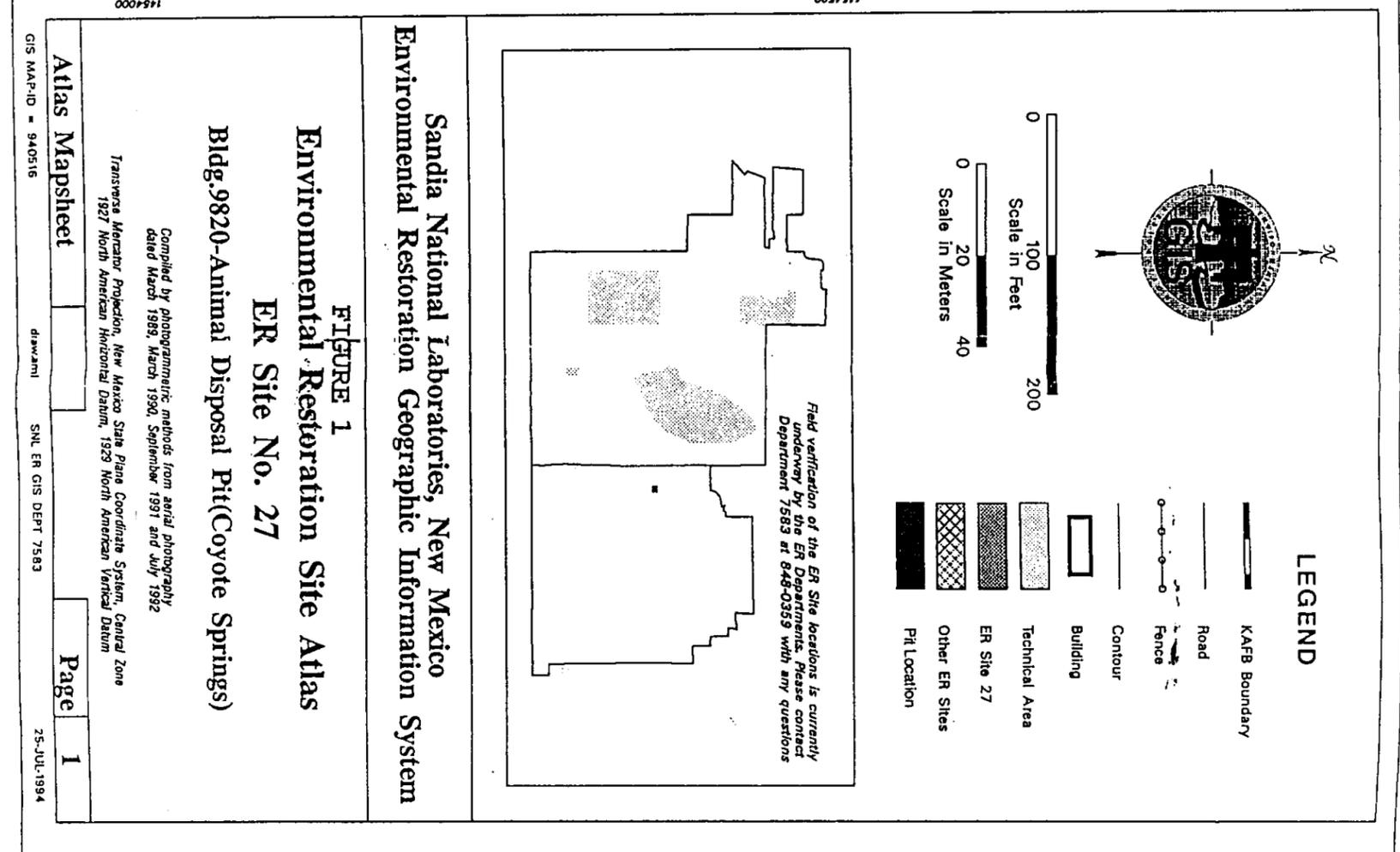
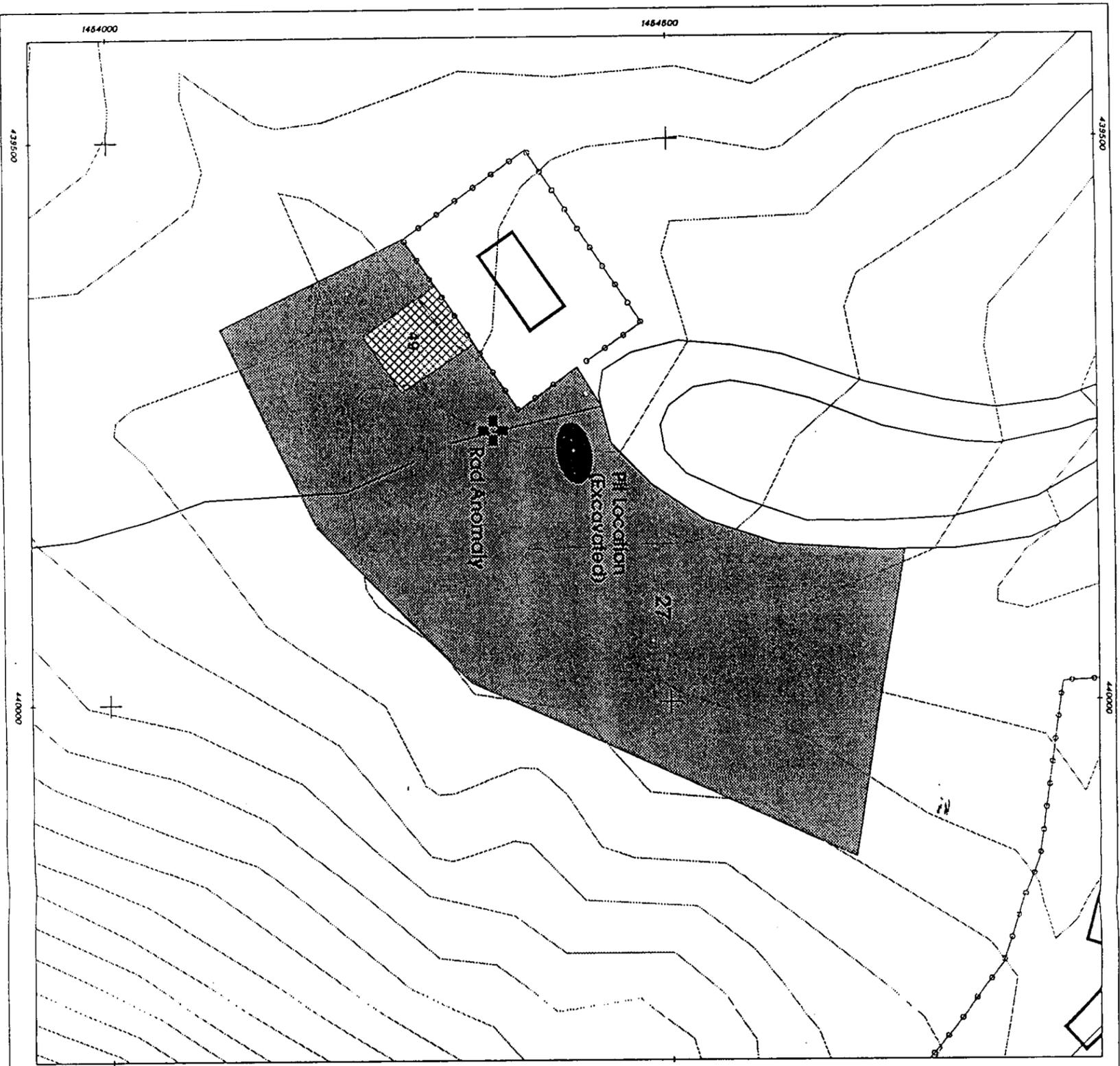
OU 1332, known as the Foothills Test Area, covers approximately 9,333 acres in the central portion of an area known as the Coyote Test Field, which is located in the eastern portion of Kirtland Air Force Base (KAFB) in an unrestricted remote test area for the Department of Defense (DoD) and Department of Energy (DOE) activities. ER sites in OU 1332 are located near the boundary between the United States Forest Service Withdrawn Area of the Cibola National Forest and KAFB. ER Site 27 is located on USFS land withdrawn from the Bureau of Land Management (BLM) and permitted to DOE.

The site is located in a canyon at the western edge of the Manzanita Mountains. A small arroyo lies to the southeast of Building 9820, and drains to the northeast (see Figure 1). Bedrock in the area is comprised of Precambrian-age rocks, primarily biotite-granites, and metavolcanic and metasedimentary rocks. The soils are comprised of a thin veneer of poorly weathered alluvium derived from the underlying bedrocks. The depth to ground water at ER Site 27 is unknown, but from observations of nearby monitoring wells, occurs in the fractured granitic bedrock.

2. History of the SWMU

2.1 Sources of Supporting Information

In preparing to request a confirmatory sampling NFA decision for ER Site 27, a background study was conducted to collect available and relevant site information. Background information sources included existing records and reports of site activity. In addition, interviews were conducted with SNL/NM staff and contractors familiar with site operational history. The study was completely documented and has provided traceable references which sustain the integrity of this proposal.



LEGEND

- KAFB Boundary
- Road
- Fence
- Contour
- Building
- Technical Area
- ER Site 27
- Other ER Sites
- Pit Location

Scale in Feet: 0, 100, 200

Scale in Meters: 0, 20, 40

**Sandia National Laboratories, New Mexico
Environmental Restoration Geographic Information System**

**FIGURE 1
Environmental Restoration Site Atlas
ER Site No. 27
Bldg.9820-Animal Disposal Pit(Coyote Springs)**

*Compiled by photogrammetric methods from aerial photography dated March 1989, March 1990, September 1991 and July 1992
Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone
1927 North American Horizontal Datum, 1929 North American Vertical Datum*

The following information sources, hierarchically listed with respect to assigned validity, were available for use in the evaluation of ER site 27:

- Soil sampling and analysis for radionuclides in the burial pit
- Unexploded ordnance/high explosives (UXO/HE) survey conducted on November 2, 1993
- Gamma surface radiation survey conducted on November 24, 1993
- Seven interviews with seven ER Site 27 facility personnel (current and retired)
- Miscellaneous information sources including SNL/NM personnel correspondence (memorandums, letters, and notes regarding ER Site 27)
- Photographs and field notes from numerous site inspections conducted by SNL/NM staff
- The Comprehensive Environmental Assessment and Response Program (CEARP) Phase I Report (Ref. 7) and CEARP records contained in the Environmental Operations Records Center
- The RCRA Facility Assessment (RFA) Report (Ref. 8)

Using this information, a brief history of ER Site 27 and a discussion of all relevant evidence regarding past waste practices and releases at the site have been prepared and are presented in this proposal for a confirmatory sampling NFA decision.

2.2 Previous Audits, Inspections, and Findings

ER Site 27 was originally listed as a potential release site based on the CEARP interviews in 1985 (Ref. 7). Allegedly, a classified radiation study using donkeys was conducted in the stable area near Building 9820. Animal remains were buried in the pit east of the building. There was no information on the radionuclide content of the animals, and the exact location of this pit was undetermined from this investigation. Insufficient information also prevented calculating a Hazard Ranking System score for the SWMU.

Later, the EPA conducted an RFA (Ref. 8). The RFA report noted that it was not known whether these carcasses contained radioactive material. The exact location and dimensions of the pit were also unknown.

2.3 Historical Operations

ER Site 27 is located near Coyote Springs Road east across the road from Building 9820 in an arroyo. Donkeys were buried in a pit approximately 20 feet by 20 feet which is located as shown in Figure 1. This site is presently an open pit. A small arroyo lies to the southeast of Building 9820, draining to the northeast.

Building 9820 was constructed in 1958, and was used for several months for high explosives (HE) synthesis. Animal guidance experiments using electronic equipment were conducted at Building 9820 in 1958 and 1959 using rats and, later, donkeys (Ref. 9, 10, and 11). The experiments were conducted for the U.S. Navy, and were classified as top secret. Security guards were posted around the area during the experiments. Two recent interviews with a technical employee who actually conducted the U.S. Navy experiments indicate that four donkeys, stabled in one end of Building 9820, were used in the experiments (Ref. 10). Some of the donkeys died as a result of the experiments and were buried in a pit near the building. Due to the highly classified nature of the tests, the exact cause of death is not disclosed herein. Since the project was highly sensitive, the excess soil was graded off so that no visible evidence was left after the burial.

In the mid 1960s, a machine shop was opened in Building 9820. From the mid-1970s to 1988, photographic processing was conducted inside Building 9820 and in a darkroom trailer parked on the west side of the building. Wastes from these activities are not associated with the burial pit but pertain to a separate SWMU, ER Site 49. Building 9820 is presently occupied by the photometrics department and Department 7535. The military also recently has conducted maneuvers in the vicinity.

The animal burial pit was originally listed as a SWMU based on a CEARP interview conducted in 1985, in which an individual who was associated with the security organization at SNL/NM stated that radiation studies were conducted on animals in this area (Ref. 7). This information conflicts with more recent information from interviews with technical personnel directly involved in the experiments, including the organization director who was responsible for the experiments, two technicians who performed the experiments, and a third technician who worked at Building 9820 not long after the experiments were conducted. According to these individuals, the tests involved experiments on animal using sophisticated electronic equipment; no radioactive or hazardous materials were used in the tests nor were film badges required (Ref. 9, 10, 11, and 12). A fourth individual who worked in the SNL/NM Health Physics organization (now named Radiation Protection Operations) at that time stated that SNL/NM policy required the Health Physics organization to be involved in projects where radioactive materials were used; this organization was not involved in these tests (Ref. 13).

3. Evaluation of Relevant Evidence

3.1 Unit Characteristics

Since no hazardous materials were used at Site 27, unit characteristics (i.e., safeguards inherent in the system design or operation) are not applicable.

3.2 Operating Practices

Hazardous wastes were not managed or contained at ER Site 27.

3.3 Presence or Absence of Visual Evidence

On June 31, 1994 an interview and site visit was conducted with the equipment operator who buried the animals (Ref. 14). He identified the exact location of the burial. The area appeared to have been excavated and all remains removed. Two small piles of borrow material, 4 feet by 4 feet and approximately 2 feet high, were evident on either side of the shallow pit. No one interviewed knew any details of the apparent excavation. Vegetation growing on the piles indicated the excavation probably occurred more than 5 years ago.

There was no visible presence of hazardous material in the pit or on the piles of borrow material during this inspection. Except for tumbleweeds which had collected in the pit, the pit was empty upon inspection.

3.4 Results of Previous Sampling Surveys

3.4.1 Unexploded Ordnance/High Explosives Survey

Recent environmental restoration activities have included a UXO survey conducted by the KAFB Explosive Ordnance Disposal (EOD) Unit on November 2, 1993. Some live ordnance from military training operations was also found in the area of ER Site 27 during a UXO survey conducted at SNL/NM from September 1993 to July 1994. The ordnance consisted of one 40-mm practice cartridge and one clip of 5.56-mm blanks. This ordnance was removed from the site by the EOD Unit (Ref. 5). It is unlikely the ordnance collected was related to ER Site 27 activities because many groups, including Defender Challenge, civil engineering, the KAFB hospital, and the KAFB security police, use the Coyote Springs as a training/bivouac area. The ordnance collected during this survey was probably the remnant of training exercises conducted by one or more of these groups.

3.4.2 Gamma Radiation Survey

On November 24, 1993 a surface radiation survey was conducted over the open pit and the area immediately surrounding the pit by RUST-Geotech per United States Department of Energy (DOE) (Ref. 16) and NUREG/CR 5849 (Ref. 17) guidance. This survey revealed no radiation anomalies greater than or equal to 1.3 times background (Ref. 8). One point source radiation anomaly identified as a fragment of depleted uranium was detected about 50 feet from the pit. It is not associated with the pit, since no radioactive material was used in the experiments. The radiation survey measurements at this point were 650 counts per second (cps) gamma, with 120 cps gamma background. The location of the radiation anomaly is shown on Figure 1. This source, although not associated with the activities at ER Site 27, was removed as part of voluntary corrective measures activities conducted in March 1995.

3.5 Assessment of Gaps in Information

There are no records that state hazardous waste or constituents were contained at ER Site 27; however, the potential data gap arising from incomplete archival records on the operation of the site has been addressed by ER Project interviews, site visits, and UXO/HE and surface gamma-radiation survey results. This new information indicates that the site never contained hazardous waste or constituents.

3.6 Confirmatory Sampling

Five soil samples were collected on June 30, 1995 at locations shown on Figure 1 in Appendix A. Two samples each were collected from the pit floor and from the spoils piles on either side of the pit; one sample was collected as background. Appendix B contains the analyses tables showing analytical results. Table 1 summarizes the results.

3.6.1 Results

Analysis of the uranium and thorium series constituents (listed in Table 1) shows that the reported analytical results are indicative of a naturally occurring background distribution in soils. This conclusion is reached by evaluating their relative activities. For the thorium ($4n$) and uranium ($4n+2$) decay series, it is expected that each daughter will be in secular equilibrium with its successive parents. This is indicated by the activities (in picocuries per gram [pCi/gram]) being approximately equal in the series.

For the radiological components at ER Site 27, the radionuclides for which the activity exceeded the Minimum Detectable Activity (MDA) appear to be in equilibrium in their respective series. This is indicated by their activity values (in pCi/g) being approximately equal. See Appendix C for a more detailed discussion.

3.7 Rationale for Pursuing a Confirmatory Sampling NFA Decision

SNL/NM is proposing an administrative NFA decision for ER Site 27 because the SWMU never contained hazardous waste or constituents (Criterion A). There is no knowledge of any waste management activities at this site and no visual or analytical evidence of buried or stored hazardous waste or constituents.

This is supported by the following evidence, as discussed previously:

1. The original source of information described in the CEARP and RFA was erroneous. The individual who provided erroneous information was a security guard at the site who did not know the nature of the tests at Building 9820 since they were classified and the individual was not directly involved with the tests.

Table 1. Summary of Analyses Scoping Sampling ER Site 27

Series	Nuclide (in pCi/g)	Sample Number				
		1332-27- 001-0.5-ss	1332-27- 002-0.5-ss	1332-27- 003-0.5-ss	1332-27- 004-0.5-ss	1332-27- 005-0.5-ss
Uranium series	Uranium-238	ND (MDA = 2.25)	ND (MDA = 2.16)	ND (MDA = 2.0)	ND (MDA = 1.97)	ND (MDA = 1.8)
	Thorium-234	ND (MDA = 1.08)	ND (MDA = 8.49×10^{-1})	ND (MDA = 8.75×10^{-1})	1.32	ND (MDA = 6.86×10^{-1})
	Uranium-234	ND (MDA = 2.08×10^{-1})	ND (MDA = 2.14×10^{-1})	ND (MDA = 1.93×10^{-1})	ND (MDA = 1.91×10^{-1})	ND (MDA = 1.65×10^{-1})
	Radium-226	9.08×10^{-1}	1.48	1.58	1.56	1.11
	Lead-214	7.05×10^{-1}	7.16×10^{-1}	5.34×10^{-1}	5.25×10^{-1}	5.71×10^{-1}
	Bismuth-214	6.09×10^{-1}	6.18×10^{-1}	4.37×10^{-1}	4.37×10^{-1}	5.36×10^{-1}
	Lead-210	ND (MDA = 4.41×10^{-1})	ND (MDA = 3.9×10^{-1})	ND (MDA = 3.87×10^{-1})	ND (MDA = 3.69×10^{-1})	ND (MDA = 3.27×10^{-1})
Thorium Series	Thorium-232	7.83×10^{-1}	7.59×10^{-1}	8.31×10^{-1}	7.98×10^{-1}	3.48×10^{-1}
	Radium-228	7.35×10^{-1}	8.93×10^{-1}	9.02×10^{-1}	8.15×10^{-1}	4.12×10^{-1}
	Actinium-228	1.01	9.24×10^{-1}	9.46×10^{-1}	8.04×10^{-1}	5.35×10^{-1}
	Thorium-228	1.15	9.38×10^{-1}	9.30×10^{-1}	5.06×10^{-1}	ND (MDA = 1.36)
	Radium-224	2.34	2.01	1.76	1.98	1.55
	Lead-212	1.02	9.32×10^{-1}	9.41×10^{-1}	9.07×10^{-1}	4.66×10^{-1}
	Bismuth-212	1.19	8.33×10^{-1}	8.50×10^{-1}	9.82×10^{-1}	5.92×10^{-1}
	Thallium-208	8.04×10^{-1}	8.01×10^{-1}	7.84×10^{-1}	8.00×10^{-1}	4.57×10^{-1}

Notes:

pCi/g = picocuries per gram.

ND = not detected.

MDA = Minimum Detectable Activity.

2. Individuals directly involved with the tests, the organization director and two technicians, stated in interviews that no radioactive materials were used in the tests.
3. Inspection of the pit in 1993 and 1994 showed no visible evidence of contamination either in the pit or the borrow mounds.
4. No radioactive anomalies were detected in the pit or borrow mounds during the radiation survey conducted in 1993.
5. Radioactivity detected at ER Site 27 during the Scoping Sampling Activity appears to be naturally occurring; i.e., in secular equilibrium, and not generated from testing.
6. UXO found at the site during the UXO survey was unrelated to ER Site 27 activities. The UXO material has been removed.

4. Conclusion

Based on evidence cited within this proposal, no potential remains for a release of hazardous waste (including hazardous constituents) which may pose a threat to human health or the environment. Therefore, ER Site 27 is recommended for an NFA determination.

5. References

5.1 ER Site References

Section 5.1 contains a bibliographical list of the documents relating to ER Site 15. This list is arranged numerically by the reference citation in the text.

1. United States Environmental Protection Agency (EPA), August 1993. Module IV of RCRA Permit No. NM 5890110518, EPA Region 6, issued to Sandia National Laboratories, Albuquerque, New Mexico.
2. United States Environmental Protection Agency (EPA), August 1992. Hazardous Waste Management Facility Permit No. NM5890110518, EPA Region 6, issued to Sandia National Laboratories, Albuquerque, New Mexico.
3. Sandia National Laboratories/New Mexico (SNL/NM), February 1995. "Program Implementation Plan for Albuquerque Potential Release Sites," Sandia National Laboratories, Albuquerque, New Mexico.
4. United States Environmental Protection Agency (EPA), July 1990. "Corrective Action for Solid Waste Management Units (SWMU) at Hazardous Waste Management Facilities Proposed Rule," *Federal Register*, Vol. 55, Title 40, Parts 264, 265, 270, and 271.

5. United States Environmental Protection Agency (EPA), December 1987. "Hazardous Waste; Codification Rule for 1984 RCRA Amendments; Final Rule," *Federal Register*, Vol. 52, Title 40, Parts 144, 264, 265, 270, and 271, Environmental Protection Agency, Washington, DC.
6. United States Environmental Protection Agency (EPA), October 1986. "RCRA Facility Assessment Guidance," EPA/530-86-053, PB87-107769, Environmental Protection Agency, Washington DC.
7. United States Department of Energy (DOE), September 1987. "Draft Comprehensive Environmental Assessment and Response Program, Phase 1: Installation Assessment," Department of Energy, Washington, DC.
8. United States Environmental Protection Agency (EPA), April 1987. RCRA Facility Assessment Draft Report, "Final RCRA Facility Assessment Report of Solid Waste Management Units at Sandia National Laboratory Albuquerque, New Mexico," Environmental Protection Agency, Washington, DC.
9. Sandia National Laboratories/New Mexico (SNL/NM), 1994. Environmental Operations Records Center Reference Number 7585/1332/27/Int/94-001, Sandia National Laboratories, Albuquerque, New Mexico.*
10. Sandia National Laboratories/New Mexico (SNL/NM), 1994. Environmental Operations Records Center Reference Number 7585/1332/27/Int/94-002, Sandia National Laboratories, Albuquerque, New Mexico.*
11. Sandia National Laboratories/New Mexico (SNL/NM), 1994. Environmental Operations Records Center Reference Number 7585/1332/27/Int/94-003, Sandia National Laboratories, Albuquerque, New Mexico.*
12. Sandia National Laboratories/New Mexico (SNL/NM), 1994. Environmental Operations Records Center Reference Number 7585/1332/27/Int/94-004, Sandia National Laboratories, Albuquerque, New Mexico.*
13. Sandia National Laboratories/New Mexico (SNL/NM), 1994. Environmental Operations Records Center Reference Number 7585/1332/27/Int/94-005, Sandia National Laboratories, Albuquerque, New Mexico.*
14. Sandia National Laboratories/New Mexico (SNL/NM), 1994. Environmental Operations Records Center Reference Number 7585/1332/27/Int/94-007, Sandia National Laboratories, Albuquerque, New Mexico.*

*The SNL/NM reference numbers refer to a SNL/NM Records Center coding system intended to maintain the confidentiality of SNL/NM employees.

15. Young, M., and C. Byrd, September 1994. "Unexploded Ordnance/High Explosives (UXO/HE) Visual Survey of ER Sites Final Report," Sandia National Laboratories, Albuquerque, New Mexico.
16. DOE guidance.
17. NUREG/CR 5849 Guidance.
18. RUST-Geotech, December, 1994. "Final Report, Surface Gamma Radiation Surveys for Sandia National Laboratories/New Mexico Environmental Restoration Project," RUST Geotech, Inc., Grand Junction, Colorado.

5.2 Reference Documents

Sandia National Laboratories/New Mexico (SNL/NM), 1985. Environmental Operations Records Center Reference Number 7585/1332/27/Int/85-068, Sandia National Laboratories, Albuquerque, New Mexico.*

*The SNL/NM reference numbers refer to a SNL/NM Records Center coding system intended to maintain the confidentiality of SNL/NM employees.

October 13, 2003

ADDITIONAL /SUPPORTING DATA

**CAN BE VIEWED AT THE
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AND SECURITY (ES&H and Security)
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