Sandia National Laboratories / New Mexico

PROPOSAL FOR NO FURTHER ACTION ENVIRONMENTAL RESTORATION PROJECT SITE 143, BUILDING 9972 SEPTIC SYSTEM OPERABLE UNIT 1295

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PROPOSAL FOR
NO FURTHER ACTION
Environmental Restoration Project

Site 143, Building 9972 Septic System
OU 1295

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1. Introduction

1.1 ER Site 143, Building 9972 Septic System

Sandia National Laboratories/New Mexico (SNL/NM) is proposing a no further action (NFA) decision based on confirmatory sampling for Environmental Restoration (ER) Site 143, Building 9972 Septic System, Operable Unit (OU) 1295. ER Site 143 is listed in the Hazardous and Solid Waste Amendment (HSWA) Module IV (EPA August 1993) of the SNL/NM Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Facility Permit (NM5890110518) (EPA August 1992).

1.2 SNL/NM Confirmatory Sampling NFA Process

This proposal for a determination of an NFA decision based on confirmatory sampling was prepared using the NFA criteria presented in Section 4.5.3 of the SNL/NM Program Implementation Plan (PIP) (SNL/NM February 1995). Specifically, the proposal "must contain information demonstrating that there are no releases of hazardous waste (including hazardous constituents) from solid waste management units (SWMUs) at the facility that may pose a threat to human health or the environment (Proposed 40 Code of Federal Regulations [CFR] 264.514[a][2])," (EPA July 1990). The HSWA Module IV of the SNL RCRA permit 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) (EPA August 1993).

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 (SNL/NM February 1995).

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

> The 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....The actual extent of sampling will vary...depending on the amount and quality of existing information available (EPA December 1987).

This request for an NFA decision for ER Site 143, Building 9972 Septic System is based primarily on results of a passive soil-gas survey (NERI 1994) and analytical results of confirmatory soil samples collected from immediately around and beneath the ER Site 143 septic system components. Concentrations of site-specific constituents of concern (COCs) were first compared to background upper tolerance limit (UTL) concentrations of COCs found in SNL/NM soils (IT October 1994). If, however, the concentration(s) of a particular COC at the site exceeded the background UTL concentrations for that compound, or if no background data were available for the constituent, then concentrations of that constituent were compared to proposed 40 CFR Part 264 Subpart S (Subpart S) soil action levels for the COC of interest (EPA July 1990). Concentrations of constituents at this site were found to be less than either or both background UTLs or proposed Subpart S action levels. The unit is therefore eligible for an NFA proposal based on one or more of the following criteria taken from the RCRA Facility Assessment Guidance (EPA October 1986):

- Criterion A: The unit has never contained constituents of concern.
- 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 143 is being proposed for an NFA decision based on confirmatory sampling data that demonstrate that hazardous waste or constituents have not been released from this SWMU into the environment (Criterion C).

1.3 Local Setting

SNL/NM occupies 2,829 acres of land owned by the Department of Energy (DOE), with an additional 14,920 acres of land provided by land-use permits with Kirtland Air Force Base (KAFB), the United States Forest Service (USFS), the State of New Mexico, and the Isleta Indian Reservation (Figure 1). SNL/NM has been involved in nuclear weapons research, component development, assembly, testing, and other research and development activities since 1945 (DOE September 1987).

ER Site 143 lies within the boundaries of SNL/NM and is located approximately 0.9 mile north of the Isleta Reservation boundary and 0.7 mile east of the Solar Power Tower, a prominent landmark in the area (Figure 1). The site is approximately 1/4 mile west of Lovelace Road, and is situated on the southeast side of Building 9972 (Figure 2). It is reached by traveling south on Lovelace Road (paved), and then turning west on the improved dirt road that services Buildings 9972 and 9970. ER Site 143 encompasses approximately 0.11 acres of land at an average elevation of 5,679 feet above mean sea level (AMSL). The land surface slopes gently to the west at this location.

The surface geology at this site is characterized by alluvial fan deposits overlain by a veneer of eolian (wind-deposited) fine to very fine sand. Alluvial fan material in the KAFB area is

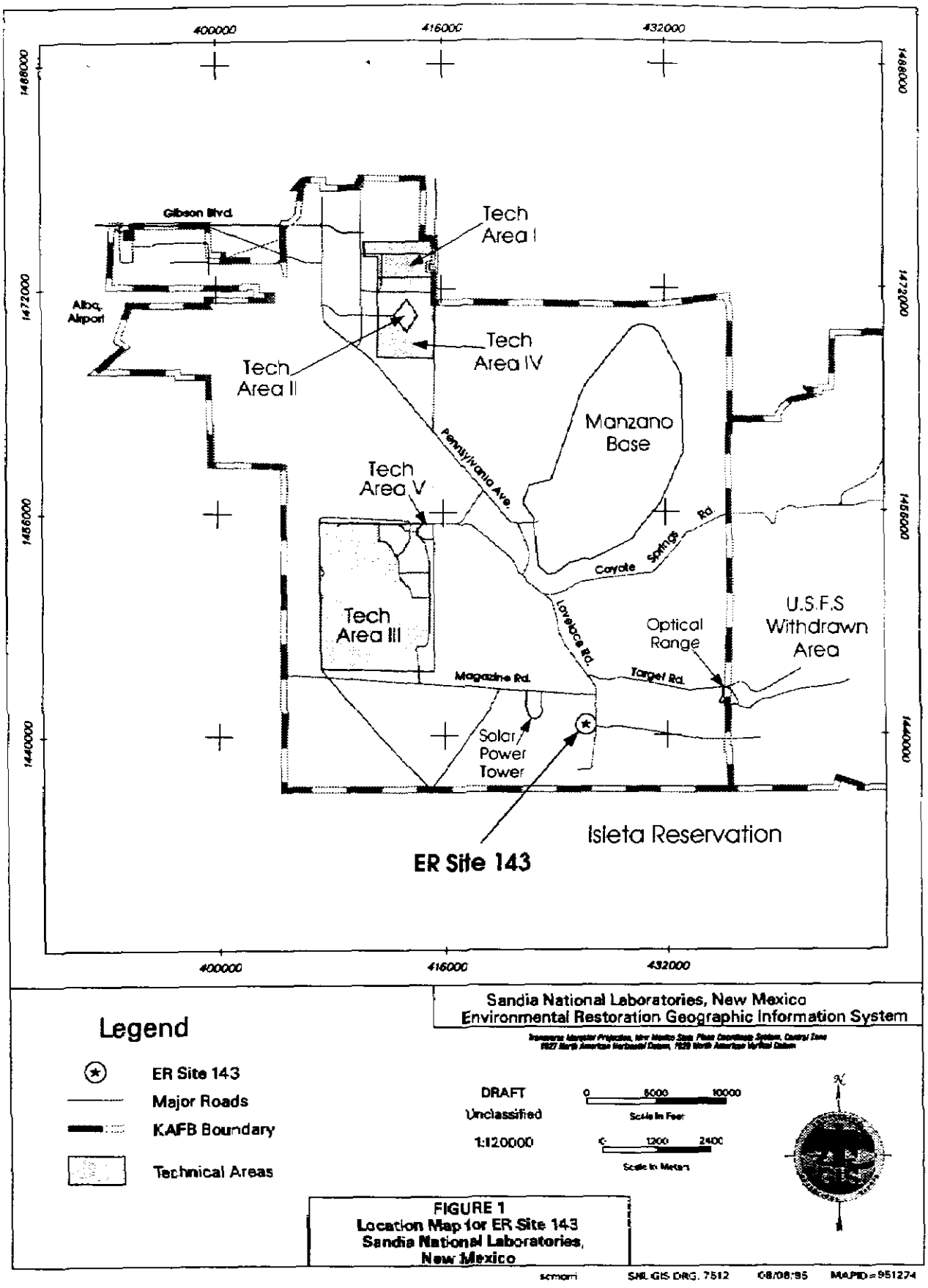

Figure 1. ER Site 143 Location Map

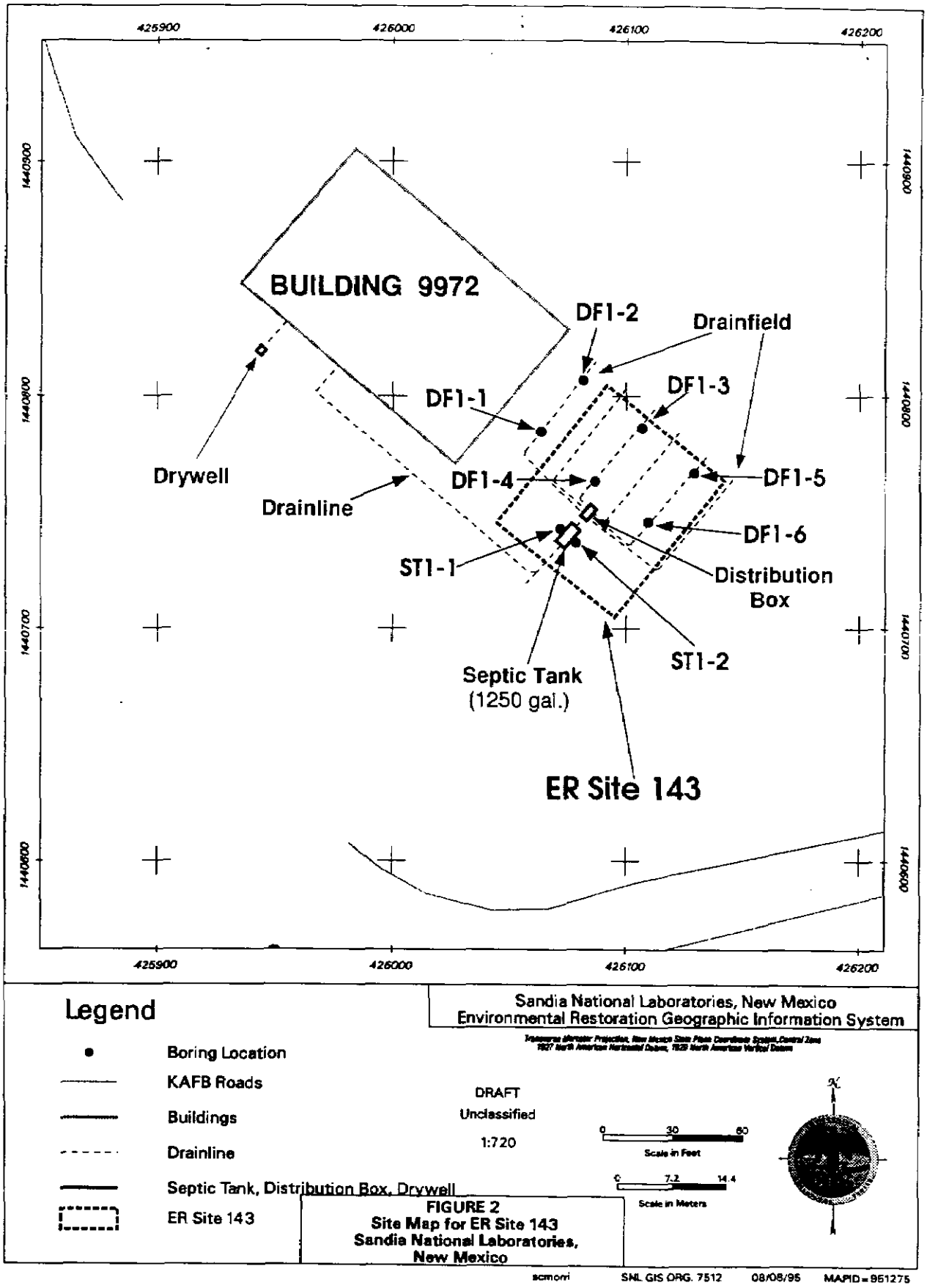

Figure 2. ER Site 143 Site Map

typically highly heterogeneous, and is typically composed of a mixture of medium to fine sand with frequent coarse sand, gravel, and cobble lenses. These deposits probably extend to the water table. Vegetation consists predominantly of grasses, including gramma, muhly, dropseed, and galleta. Shrubs commonly associated with the grasslands include sand sage, winter fat, saltbrush, and rabbitbush. Cacti are common, and include cholla, pincushion, strawberry, and prickly pear (SNL/NM March 1993).

The water-table elevation is approximately 5,560 feet AMSL at this location, so depth to water at the site is about 119 feet. Ground water is believed to flow in a westerly direction beneath the site (SNL/NM March 1995). The nearest ground-water monitoring well (designated TRN-1) is located about 2,000 feet east of, and approximately upgradient, of ER Site 143. The nearest water production well is KAFB-8 which lies approximately 4.5 miles northwest of the site (SNL/NM March 1995).

2. History of the SWMU

2.1 Sources of Supporting Information

In preparing the confirmatory sampling NFA proposal for ER Site 143, available background information was reviewed to quantify potential releases and to select analytes for the soil sampling. Background information was collected from SNL/NM facilities engineering drawings and from interviews with employees familiar with the operational history at the site.

The following sources of information, hierarchically listed with respect to assigned importance and validity, were used to evaluate ER Site 143:

- Confirmatory shallow subsurface soil samples collected in November 1994
- A passive soil-gas survey completed in June 1994
- Three sets of septic tank sludge and/or liquid samples collected in June 1992, April 1994, and November 1994
- RCRA Facilities Investigation Work Plan for OU 1295, Septic Tanks and Drainfields
- SNL/NM facilities engineering drawings
- Photographs and field notes collected by SNL/NM ER staff
- SNL/NM Geographic Information System (GIS) data
- The RCRA Facility Assessment (RFA) report

2.2 Previous Audits, Inspections, and Findings

Numerous SNL/NM septic systems were first listed as a single site (ER Site 79) in the RFA report (EPA April 1987) because of the potential that hazardous materials may have been discharged to the septic systems. ER Site 143 was listed as an individual septic system site in 1991, as a precursor to preparation of the HSWA permit (EPA August 1993). However, no releases had been reported from the facility.

2.3 Historical Operations

The following historical and site operational information is based on a number of references and information sources including IT March 1994, SNL/NM November 1985 and March 1993, and field observations (SNL/NM August 1994 and November 1994a).

ER Site 143 includes the area immediately surrounding the septic system serving Building 9972. The building was constructed in 1987 and used for radar development. Waste chemicals or contaminants reportedly were never discharged into the septic system according to the building occupants.

A septic system which received discharge from a restroom is located southeast of the building (Figure 2). Effluent and discharges from the sink and toilet are now directed to an extension of the City of Albuquerque sanitary sewer system, rather than the septic system, which is no longer in use.

A 3-foot square drywell filled with 0.75-inch aggregate is buried 2 feet below grade near the northwest side of the building (Figure 2). According to interviews with building operators during the September 1993 site visit, no floor drains exist in the northwest part of the building, as postulated in the RFI work plan (SNL/NM March 1993). The drywell serves as a drain for condensate from an air conditioning unit located inside the building, and still is in use. The area where the drywell is located is covered with asphalt paving. EPA reviewed the Septic Tanks and Drainfields RFI Work Plan and provided comments on that document as a Notice of Deficiency (NOD) in October 1994. On November 17, 1994, DOE/SNL/NM submitted comment responses to the NOD (SNL/NM November 1994c). In the "Proposed Modifications To The Work Plan" section of that document (pages 28 and 29), it was proposed not to perform any investigation around the drywell because there was no evidence or history of contaminant releases to this condensate-draining unit. EPA in its reply to these responses did not take exception to this proposal (EPA March 1995). Therefore, no sampling was conducted around this drywell.

3. Evaluation of Relevant Evidence

3.1 Unit Characteristics

Release of effluent and discharges from the Building 9972 toilet and sink to the septic system was routine practice when the septic system was in use. Although waste chemicals or

contaminants reportedly were never discharged into the septic system, there are no safeguards inherent in the drain system from Building 9972 or in facility operations that could have prevented past releases to the environment. Hazardous wastes were not managed or contained at ER Site 143.

3.2 Operating Practices

There are no known or reported spills that occurred or cleanup actions that were taken at ER Site 143.

3.3 Presence or Absence of Visual Evidence

In August 1994 a backhoe was used to determine the exact locations and depths below the surface of the Building 9972 drainfield drain lines to select appropriate locations for the soil sampling boreholes (SNL/NM August 1994). The drainfield excavating operation is shown in the top photograph of Figure 3. The rectangular-shaped drainfield was found to be approximately 80 feet wide by 50 feet long, and contained six 50-foot-long parallel drain lines. The drain lines are composed of 4-inch-diameter perforated PVC pipe that had been placed on top of about 1.5 feet of aggregate in trenches, and were buried about 7 feet below the surface on average. No visual or olfactory evidence of contamination was noted in soils excavated from the drain line trenches (SNL/NM August 1994).

No visible evidence of soil discoloration, staining, or odors indicating residual contamination were observed when soil samples were collected adjacent to the septic tank and beneath the drainfield in the fall of 1994 (SNL/NM November 1994a).

3.4 Results of Previous Sampling/Surveys

Liquid and sludge samples were collected from the Building 9972 septic tank on June 23, 1992. These samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, various radionuclide isotopes, and other miscellaneous compounds. The samples contained low concentrations of several VOC and SVOC constituents, heavy metals, phenolic compounds, radionuclide isotopes, and other miscellaneous constituents (IT June 1993). A summary of the constituents detected in these 1992 septic tank samples are presented in Table A.1 of Appendix A.

A second set of sludge samples was collected from the Building 9972 septic tank on April 7, 1994 for additional waste characterization purposes. These samples were analyzed for VOCs, Toxicity Characteristic Leaching Procedure (TCLP) metals, and phenols. Low concentrations of five VOCs commonly encountered as laboratory contaminants and phenols were identified. Only barium was detected in the TCLP-derived leachate, but at a concentration well below the RCRA Toxicity Characteristic action level of 100 milligrams per liter (mg/L) for this metal. A summary of the constituents detected in these samples is presented in Table A.2 of Appendix A.

Locating the ER Site 143 drainfield drain lines with a backhoe, 8/31/94, view looking SW.

Collecting soil samples in the ER Site 143 drainfield with the Geoprobe, 11/9/94, view looking SW.

Figure 3. ER Site 143: Photographs

Another set of aqueous and sludge samples was collected from the septic tank on November 15, 1994 in order to complete additional analyses required for waste characterization. The liquid samples were analyzed for isotopic uranium, tritium, and gamma spectroscopy radionuclides; only very low concentrations of three isotopic uranium constituents were detected in the liquid fraction from this tank. The sludge samples were analyzed for and contained low concentrations of five SVOCs, isotopic uranium, tritium, and two gamma spectroscopy radionuclides. A summary of the constituents detected in these November 1994 samples is also presented in Table A.2 of Appendix A.

The multiple rounds of ER Site 143 septic tank sampling described above were completed to characterize the current septic tank contents for waste disposal purposes. The sludge and liquid in the tank are adequately characterized and will be disposed of as a separate removal action.

The passive soil-gas survey conducted at the site in late June 1994 utilized PETREX sampling tubes to identify any releases of VOCs and SVOCs to the soil around the septic tank and seepage pit (SNL/NM June 1994). A PETREX tube soil-gas survey is a semiquantitative reconnaissance screening procedure that can be used to identify many VOCs and SVOCs and can be used to guide VOC and SVOC site investigations. The advantages of this soil-gas sampling methodology are that large areas can be surveyed at relatively low cost, the technique is highly sensitive to organic vapors, and the result produces a measure of soil-vapor chemistry integrated over a two- to three-week period rather than at one point in time. Each PETREX soil-gas sampler consists of two activated charcoal adsorption coated wires housed in a reusable glass test tube container. At each sampling location, sample tubes are buried in an upside down position so that the mouth of the sampler is about 1 foot below grade. Samplers are left in place for a two- to three-week period, and are then removed from the ground and sent to the manufacturer, Northeast Research Institute (NERI), for analysis using Thermal Desorption-Gas Chromatography/Mass Spectrometry. The analytical laboratory reports all sample results in terms of "ion counts" instead of concentrations, and identifies those samples that contain compounds above the PETREX technique detection limits. NERI considers a "hit" for individual compounds (such as perchloroethene [PCE] or trichloroethene [TCE]) to be greater than 100,000 ion counts, and 200,000 ion counts for compound mixtures (benzene, toluene, ethylbenzene, xylene [BTEX], or aliphatic compounds, for example) (NERI 1994).

The soil-gas survey identified several COCs in the Site 143 drainfield. PCE was detected at one sampling location, BTEX constituents were identified at three locations, and aliphatic compounds were detected in soil-gas samples at two locations. The analytical results of the passive soil-gas survey at ER Site 143 are included in Table A.3 of Appendix A (NERI 1994).

3.5 Assessment of Gaps in Information

The material currently in the tank is not necessarily representative of all discharges to the unit that have occurred since it was put into service in 1987. The analytical results of the various rounds of septic tank sampling were used, along with process knowledge and other

available information, to help identify the most likely COCs that might be found in soils surrounding the septic tank and beneath the drainfield, and to help select the types of analyses to be performed on soil samples collected from the site. While the history of past releases is incomplete, analytical data from confirmatory sampling conducted in the fall of 1994 (discussed below) are sufficient to determine whether the release of hazardous constituents occurred at the site.

3.6 Confirmatory Sampling

Although the likelihood of hazardous waste releases at ER Site 143 is considered low, confirmatory soil sampling was conducted in November 1994 immediately adjacent to the septic tank and in the drainfield to determine whether COCs above background or detectable levels were released by the septic system to the environment. The confirmatory soil sampling program was performed in accordance with the rationale and procedures described in the Septic Tank and Drainfields (ADS-1295) RCRA Facility Investigation Work Plan (Work Plan) (SNL/NM March 1993), and addenda to the Work Plan developed during the OU 1295 project approval process (IT March 1994 and SNL/NM November 1994c).

A summary of the types of samples, number of sample locations, sample depths and analytical requirements for confirmatory samples collected at this site is presented in Table 1.

Table 1
ER Site 143: Confirmatory Sampling Summary Table

ER Site Number and Unit	Analytical Parameters	Number of Sample Locns.	Top of Splg. Interval(s) at Each Boring Location	Total Number of Invest. Samples	Total Number of Duplicate Samples	Date(s) Samples Collected
143 septic tank (outside bottom of tank is 9 feet below grade, measured in field)	VOCs	2	9'	2		11/14/94
	SVOCs	2	9'	2		
	RCRA metals	2	9'	2		
143 drainfield (bottom of drain line trenches are average of 9 feet below grade, measured in field)	VOCs	6	9', 19'	12	1	11/ 9 - 14 /94
	SVOCs	6	9', 19'	12	1	
	RCRA metals	6	9', 19'	12	1	
	Tritium composite	6	9', 19'	2		
	Gamma spec. compos.	6	9', 19'	2		

Notes

VOC = Volatile organic compounds
SVOC = Semivolatile organic compounds
RCRA = Resource Conservation and Recovery Act

Confirmatory soil samples were collected from one boring on either side of the septic tank, and from six borings next to every other drainfield drain line. Borehole locations, and the locations of the septic tank and drainfield drain lines are shown on Figure 2. For septic tank borings, samples were collected from one interval in each borehole starting at the outside bottom of the tank, which was 9 feet below ground surface (bgs) at this site. For drainfield borings, samples were collected from two intervals in each borehole. The top of the shallow interval started at the bottom of the drain line trenches which were 9 feet bgs on average at this site, and the lower (deep) interval started at 10 feet below the top of the upper interval, or 19 feet bgs. The bottom photograph of Figure 3 shows the soil sampling operation in the Site 143 drainfield.

The Geoprobe sampling system was used to collect subsurface soil samples at this site. The Geoprobe sampling tool was fitted with a butyl acetate (BA) sampling sleeve and was then hydraulically driven to the top of the designated sampling depth. The sampling tool was opened, and driven an additional 2 feet in order to fill the 2-foot long by approximately 1.25-inch-diameter BA sleeve. The sampling tool and soil-filled sleeve were then retrieved from the borehole. In order to minimize the potential for loss of volatile compounds (if present), the soil to be analyzed for VOCs was not emptied from the BA sleeve into another sample container. Instead, the filled BA sleeve was removed from the sampling tool, and the top 7 inches were cut off. Both ends of the 7-inch section of filled sleeve were immediately capped with a teflon membrane and rubber end cap, sealed with tape, and placed in an ice-filled cooler at the site. The soil in this section of sleeve was submitted for a VOC analysis.

Soil from the remainder of the sleeve was then emptied into a decontaminated mixing bowl. Following this, one or two more 2-foot sampling runs were completed at each interval in order to recover enough soil to satisfy sample volume requirements for the interval. Soil recovered from these additional runs was also emptied into the mixing bowl, and blended with soil from the first sampling run. The soil was then transferred from the bowl into sample containers using a decontaminated plastic spatula, and was analyzed for SVOCs and total RCRA metals. Routine SNL/NM chain-of-custody and sample documentation procedures were employed, and samples were shipped to the laboratory by an overnight delivery service.

There is no known evidence or information indicating that radionuclide materials were used at Building 9972. However, in order to confirm that no radionuclides were released from past activities at this site, composite soil samples were collected from both the shallow and deep sampling intervals in the drainfield borings, analyzed by a commercial laboratory for tritium, and also screened for other radionuclides using SNL/NM in-house gamma spectroscopy. Tritium and gamma spectroscopy composite screening samples were not collected from the septic tank borings because of their close proximity to the drainfield sampling locations.

A summary of all constituents detected by commercial laboratory analyses in these confirmatory samples is presented in Tables 2, 3, and 4. Results of the SNL/NM in-house gamma spectroscopy composite soil sample screening for other radionuclides are presented in Appendix A, Tables A.4 and A.5. Complete analytical data packages are archived in the

Environmental Operations Records Center and are readily available for review and verification (SNL/NM November 1994b).

Quality assurance/quality control (QA/QC) samples collected during this sampling effort consisted of one set of duplicate soil samples from the shallow interval in drainfield borehole DF1-2, and one set of aqueous equipment rinsate samples that were analyzed for the same nonradiologic constituents as the field samples. As shown in Tables 2 and 3, the analytical results for the duplicate samples were in good agreement with those for the equivalent field sample. Also, no significant concentrations of contaminants were identified in the equipment rinsate samples (Table 2 and 3). In addition, a soil trip blank sample was included with the shipment of ER Site 148 VOC soil samples to the laboratory and was analyzed for VOCs only. Acetone, 2-hexanone, 2-butanone (MEK), methyl isobutyl ketone (MIBK), methylene chloride, and below-reporting-limit concentrations of 1,1,2,2-tetrachloroethane (1,1,2,2-PCA), toluene, and xylenes were detected in this soil trip blank by the laboratory. These common laboratory contaminants were either not detected or were found in lower concentrations in the site soil samples compared to the trip blank. Soil used for the trip blank was prepared by heating the material, and then transferring it immediately to the sample container. This heating process drives off any residual VOCs (if present) and soil moisture that may be contained in the material. Apparently when the soil trip blank container was opened at the laboratory, it immediately adsorbed both moisture and VOCs present in the laboratory atmosphere, and therefore became contaminated.

3.7 Rationale for Pursuing a Confirmatory Sampling NFA Decision

Three rounds of septic tank liquid and/or sludge samples were collected for waste characterization purposes and identified only low concentrations of a limited number of VOCs, SVOCs, metals, other miscellaneous compounds, and radiological constituents. Although the passive soil-gas survey indicated possible VOC and SVOC contamination at a few locations in the drainfield, subsequent laboratory analysis of soil samples from the drainfield detected only the common laboratory contaminant toluene in one soil sample at a below-reporting-limit concentration of 1.6 micrograms per kilogram (μg/kg). None of the other COCs identified in the PETREX tubes were detected in soil samples from the site.

Confirmatory soil sampling on either side of the septic tank and at six locations in the drainfield did not identify any residual COCs that indicate past discharges from these units could pose a threat to human health or the environment. No evidence of leakage or discharge from the septic tank into surrounding soils was identified from the soil sampling. The three VOC compounds that were identified in the septic tank and drainfield field soil samples were, for the most part, detected at below-reporting-limit concentrations, and are common laboratory contaminants (Table 2). No SVOC compounds were detected in any of the soil samples collected at this site.

Soil sample analytical results also indicate that except for arsenic, barium, and selenium, the eight metals that were targeted in the investigation were either not detected, or were detected at concentrations below the background UTL concentrations of metals presented in the draft SNL/NM study of naturally occurring constituents (IT October 1994) (Table 3). As shown

Table 2

ER Site 143
Summary of Organic Constituents Detected in Confirmatory Soil Samples
Collected Around the Septic Tank and in the Drainfield

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	VOCs Method 8240								SVOCs Method 8270	Units
						Acetone	2-Hexanone	MEK	MIBK	Meth. Chloride	1,1,2,2-PCA	Toluene	Total Xylenes		
018182-1,2	Soil	Field	11/9/94	DF1-1	9	7.1 J	ND	ND	ND	1.8 J	ND	ND	ND	ND	ug/kg
018458-1,2	Soil	Field	11/9/94	DF1-1	19	4.2 J	ND	ND	ND	1.9 J	ND	ND	ND	ND	ug/kg
018463-1,2	Soil	Field	11/10/94	DF1-2	9	5.6 J	ND	ND	ND	2.5 J	ND	ND	ND	ND	ug/kg
018464-1,2	Soil	Dupl.	11/10/94	DF1-2	9	3.3 J	ND	ND	ND	2.2 J	ND	ND	ND	ND	ug/kg
018465-1,2	Soil	Field	11/10/94	DF1-2	19	ND	ND	ND	ND	2.2 J	ND	ND	ND	ND	ug/kg
018466-1,2	Soil	Field	11/10/94	DF1-3	9	ND	ND	ND	ND	2.3 J	ND	ND	ND	ND	ug/kg
018467-1,2	Soil	Field	11/10/94	DF1-3	19	ND	ND	ND	ND	1.8 J	ND	ND	ND	ND	ug/kg
018459-1,2	Soil	Field	11/10/94	DF1-4	9	ND	ND	ND	ND	2.0 J	ND	ND	ND	ND	ug/kg
018460-1,2	Soil	Field	11/10/94	DF1-4	19	5.8 J	ND	ND	ND	1 J	ND	ND	ND	ND	ug/kg
018469-1,2	Soil	Field	11/14/94	DF1-5	9	11 B	ND	7.8 J	ND	3.7 J	ND	ND	ND	ND	ug/kg
018470-1,2	Soil	Field	11/14/94	DF1-5	19	9.8 J,B	ND	4.3 J	ND	3.5 J	ND	ND	ND	ND	ug/kg
018461-1,2	Soil	Field	11/10/94	DF1-6	9	3.7 J	ND	ND	ND	1.7 J	ND	ND	ND	ND	ug/kg
018462-1,2	Soil	Field	11/10/94	DF1-6	19	ND	ND	ND	ND	1.9 J	ND	ND	ND	ND	ug/kg
018468-1	Soil	TB	11/10/94	Site 143	NA	180	18	61	2.2 J	7.7	1.7 J	1.6 J	2.3 J	NS	ug/kg
018473-1,2	Water	EB	11/14/94	Site 143	NA	ND	ND	ND	ND	1.5 J	ND	ND	ND	ND	ug/L
018471-1,2	Soil	Field	11/14/94	ST1-1	9	6.1 J,B	ND	2.6 J	ND	3.1 J	ND	ND	ND	ND	ug/kg
018472-1,2	Soil	Field	11/14/94	ST1-2	9	10 B	ND	3.3 J	ND	2.6 J	ND	ND	ND	ND	ug/kg
Laboratory Detection Limit For Soil						10	10	10	10	5	5	5	5	330 or 1600	ug/kg
Laboratory Detection Limit For Water						10	10	10	10	5	5	5	5	10-50	ug/L
Proposed Subpart S Action Level For Soil						8E+06	None	5E+07	4E+06	9E+04	4E+04	2E+07	2E+08	NA	ug/kg

Table 2, continued

ER Site 143
Summary of Organic Constituents Detected in Confirmatory Soil Samples
Collected Around the Septic Tank and in the Drainfield

Notes

B = Compound detected in associated blank sample
Dupl. = Duplicate soil sample
EB = Equipment rinsate blank
fbgs = feet below ground surface
J = Result is detected below the reporting limit or is an estimated concentration.
MEK = Methyl ethyl ketone, or 2-Butanone
Meth. chloride = Methylene chloride
MIBK = 4-Methyl-2-pentanone
NA = Not applicable
ND = Not detected
NS = No sample
TB = Trip blank
1,1,2,2 PCA = 1,1,2,2-Tetrachloroethane
ug/kg = Micrograms per kilogram
ug/L = Micrograms per liter
VOC = Volatile organic compounds
SVOC = Semivolatile organic compounds

Table 3

ER Site 143
Summary of RCRA Metals in Confirmatory Soil Samples
Collected Around the Septic Tank and in the Drainfield

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	RCRA Metals, Methods 6010 and 7471								Units
						As	Ba	Cd	Cr, total	Pb	Hg	Se	Ag	
018182-2	Soil	Field	11/9/94	DF1-1	9	5.2	202	ND	5.1	7.7	ND	ND	ND	mg/kg
018458-2	Soil	Field	11/9/94	DF1-1	19	2.4	775	0.54	4.7	8.7	ND	ND	ND	mg/kg
018463-2	Soil	Field	11/10/94	DF1-2	9	4.1	86.2	ND	6.3	8.8	ND	ND	ND	mg/kg
018464-2	Soil	Dupl.	11/10/94	DF1-2	9	4.9	91	ND	7.6	8.5	ND	ND	ND	mg/kg
018465-2	Soil	Field	11/10/94	DF1-2	19	3.4	34.4	ND	5.5	9	ND	ND	ND	mg/kg
018466-2	Soil	Field	11/10/94	DF1-3	9	4.5	90.5	ND	6.8	8.7	ND	ND	ND	mg/kg
018467-2	Soil	Field	11/10/94	DF1-3	19	3.7	49.7	ND	5.5	6.1	ND	ND	ND	mg/kg
018459-2	Soil	Field	11/10/94	DF1-4	9	4	109	ND	6.1	8.6	ND	ND	ND	mg/kg
018460-2	Soil	Field	11/10/94	DF1-4	19	13.8	36.1	ND	8.2	11.6	ND	ND	ND	mg/kg
018469-2	Soil	Field	11/14/94	DF1-5	9	5.5	224	ND	2.6	ND	ND	ND	ND	mg/kg
018470-2	Soil	Field	11/14/94	DF1-5	19	5.2	214	ND	2.4	ND	ND	ND	ND	mg/kg
018461-2	Soil	Field	11/10/94	DF1-6	9	3.5	35.5	ND	4.3	7.4	ND	ND	ND	mg/kg
018462-2	Soil	Field	11/10/94	DF1-6	19	5.4	28.9	ND	7.6	8.9	ND	0.65	ND	mg/kg
018473-2	Water	EB	11/14/94	Site 143	NA	ND	ND	ND	ND	ND	ND	ND	ND	mg/L
018471-2	Soil	Field	11/14/94	ST1-1	9	2.2	31.3	ND	2.6	4.4 J	ND	ND	ND	mg/kg
018472-2	Soil	Field	11/14/94	ST1-2	9	2.6	90.9	ND	3.3	ND	ND	ND	ND	mg/kg
Laboratory Detection Limit For Soil						1	1	0.5	1	5	0.1	0.5	1	mg/kg
Laboratory Detection Limit For Water						0.01	0.01	0.005	0.01	0.003	0.0002	0.005	0.01	mg/L
SNL/NM Soil Background Range *						U	0.13-730	0.1-8.5	0.01-58.1	1-110	U	U	0.05-10	mg/kg
SNL/NM Soil Background UTL, 95th %tile *						U	407.9	3.51	22.9	15	U	U	4	mg/kg
Proposed Subpart S Action Level For Soil						20	6,000	80	80,000**	400***	20	400	400	mg/kg

Notes

As = Arsenic
Ba = Barium
Cd = Cadmium
Cr = Chromium
Pb = Lead
Hg = Mercury
Se = Selenium
Ag = Silver
Dupl. = Duplicate soil sample
EB = Equipment rinsate blank
fbgs = Feet below ground surface
NA = Not applicable
ND = Not detected
U = Undefined for SNL/NM soils
UTL = Upper Tolerance Limit
mg/kg = milligrams per kilogram
mg/L = Milligrams per liter
* IT Corp., October 1994
** 80,000 mg/kg is for Cr3+ only. For Cr6+, proposed Subpart S action level is 400 mg/kg.
*** No proposed Subpart S action level for lead in soil, 400 ppm is EPA proposed action level (EPA, July 1994)

in Table 3, low concentrations of arsenic were detected in all of the ER Site 143 field soil samples and one sample contained detectable selenium, but background concentrations of these two metals have not been determined in SNL/NM soils. Arsenic and selenium concentrations were therefore compared to, and found to be much lower than, the proposed Subpart S soil action levels for those metals. Also, a single soil sample from a drainfield borehole (DF1-1) contained barium at a concentration of 775 milligrams per kilogram (mg/kg). This concentration is above the background UTL of 407.9 mg/kg for that metal, but is well below the 6,000 mg/kg proposed Subpart S action level for barium.

In addition, tritium was not detected in the shallow interval composite soil sample collected from the shallow drainfield intervals and was identified at a blank-adjusted activity level of 380 picocuries per liter (pCi/L) in the deep interval composite drainfield soil sample (Table 4). The tritium detection limit and total error for this deep interval sample was elevated because only a limited amount of soil moisture was available for analysis. Finally, as shown in Tables A.4 and A.5 of Appendix A, the gamma spectroscopy screening of the drainfield shallow and deep interval composite soil samples detected only very low activity levels of a few radionuclides and did not indicate the presence of contamination from other radionuclides at this site.

4. Conclusion

Sample analytical results generated from this confirmatory sampling investigation have shown that detectable or significant concentrations of COCs are not present in soils at ER Site 143 and that additional investigations are unwarranted and unnecessary. SNL/NM will remove the remaining liquid and sludge from the septic tank, properly dispose of the material, and decommission the septic system in accordance with local ordinances.

Based on archival information and analytical results of soil samples collected at the likely points of release of effluent from the Building 9972 Septic System, SNL/NM has demonstrated that hazardous waste or COCs were not released from this SWMU into the environment (Criterion C of Section 1.2) and the site does not pose a threat to human health or the environment. Therefore, ER Site 143 is recommended for an NFA determination.

5. References

5.1 ER Site 143 References

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Table 4

ER Site 143
Summary of Tritium Analyses of Composite Confirmatory Soil Samples
Collected in the Drainfield

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	Analytical Method	Compound Name	Results	+- 2 Sigma Uncertainty	Detection Limit	Background UTL Activity **	Units
018182-4	Soil	Composite	11/14/94	DF1-1/6	9	EPA-600 906.0	Tritium (net)*	ND	150	250	U	pCi/L
018458-4	Soil	Composite	11/14/94	DF1-1/6	19	EPA-600 906.0	Tritium (net)*	380	1500	2500	U	pCi/L

Notes

fbgs = Feet below ground surface
pCi/L = Picocuries per liter
U = Undefined for SNL/NM soils
UTL = Upper Tolerance Limit
* Net tritium value = gross result minus blank sample result.
** = IT Corp., October 1994

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