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**RCRA FACILITY INVESTIGATION,  
FORMER MAIN POST LANDFILL NO.3, WSMR-61 (SWMU 65)**

**Submitted to:**

**U.S. Army  
White Sands Missile Range  
Environment and Safety Directorate  
White Sands Missile Range, New Mexico 88002-5048**

**June 2001**

**Submitted by:**

**MEVATEC Corporation  
Building 126  
White Sands Missile Range, New Mexico 88002**

## **EXECUTIVE SUMMARY**

The Former Main Post Landfill No. 3 (MPLF#3), identified as Solid Waste Management Unit (SWMU) #65 in the Resource Conservation and Recovery Act (RCRA) Part B Permit Corrective Action Module VIII, is located in the southeast portion of the White Sands Missile Range (White Sands) Main Post area. MPLF#3 has also been identified as WSMR-61 under the Defense Site Environmental Restoration Tracking System (DSERTS). Described as a trench type sanitary landfill where only inert materials were disposed, MPLF#3 was reported to have been in operation from 1965 through 1982. Landfill operations ceased, prior to the implementation of RCRA, due to the proximity of the landfill to the shallow freshwater aquifer utilized as potable drinking water by the Main Post area. Also formerly located over a small portion of this site was the Scrap Metal Accumulation Point, as shown in Figure 1-3.

This document has been developed to support a petition for no further action with the New Mexico Environment Department and to serve as a 5-year U.S. Army Installation Restoration Plan (IRP) Review document. Activities included in developing this document consisted of research of previous investigations, historical groundwater monitoring results, background site information, and natural and cultural resource surveys conducted at this site.

Historical groundwater monitoring results have indicated that MPLF#3 has not impacted the fresh water aquifer. No concentrations of VOCs, fuel hydrocarbons, metals, or explosives have been detected above reporting limits in the samples collected from the monitoring wells at MPLF#3.

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## LIST OF ACRONYMS

°C	Degrees Celsius
°F	Degrees Fahrenheit
AOC	Area of Concern
CFR	Code of Federal Regulations
cm	centimeter
DSERTS	Defense Site Environmental Restoration Tracking System
EDB	1,2 dibromoethane
ESE	Environmental Science and Engineering, Inc.
ft	feet
GPR	Ground Penetrating Radar
HSWA	Hazardous and Solid Waste Act
in.	inches
IO	Isolated Occurrence
IRP	Installation Restoration Program
km	kilometers
m	meters
mg/L	milligrams per liter
mi.	miles
MPLF#3	Main Post Landfill No. 3
MW-#	Monitoring Well – #
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NM	New Mexico
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes (Annotated)
NMWQCC	New Mexico Water Quality Control Commission
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenols
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
sq. km	square kilometers
sq. mi.	square miles
SvE	Sverdrup Environmental, Inc.
SVOC	Semi-volatile organic compounds
SWMU	Solid Waste Management Units
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency

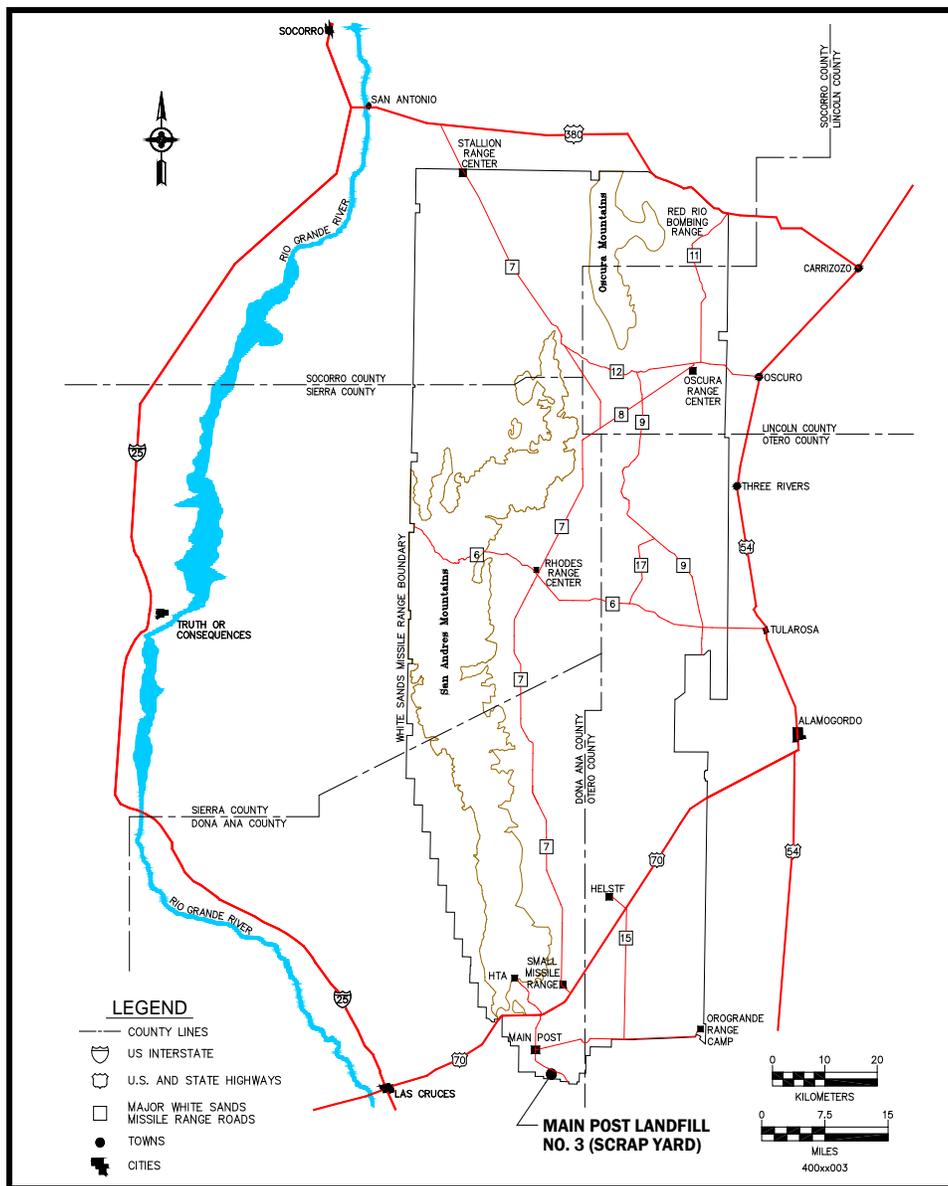
**LIST OF ACRONYMS**  
(concluded)

VOC	Volatile Organic Compounds
White Sands	White Sands Missile Range
µg/L	micrograms per liter

## RCRA FACILITY INVESTIGATION, FORMER MAIN POST LANDFILL NO.3, WSMR-61 (SWMU#65)

### 1.0 INTRODUCTION

In operation for seventeen years, from 1965 to 1982, the Main Post Landfill No. 3 (MPLF#3) functioned as a inert sanitary materials receiving landfill located in the southeast portion of the White Sands Missile Range (White Sands) Main Post area (see Figure 1-1). MPLF#3 has been identified as Solid Waste Management Unit (SWMU) #65 under the Resource Conservation and Recovery Act (RCRA) Part B Permit Corrective Action Module VIII and as WSMR-61 under the Defense Site Environmental Restoration Tracking System (DSERTS). The former Scrap Metal Accumulation Point was also located over a small portion of MPLF#3, as indicated in Figure 1-3.



**Figure 1-1. White Sands Missile Range, New Mexico.**

Contained in the following text are summaries of findings from previous site investigations, historical groundwater monitoring, and natural and cultural resource surveys that support a petition for no further action with the regulatory authority. This document has also been developed to serve as the five year U.S. Army Installation Restoration Program (IRP) review document for MPLF#3.

## **1.1 White Sands Missile Range – Background**

### **1.1.1 Location and Background**

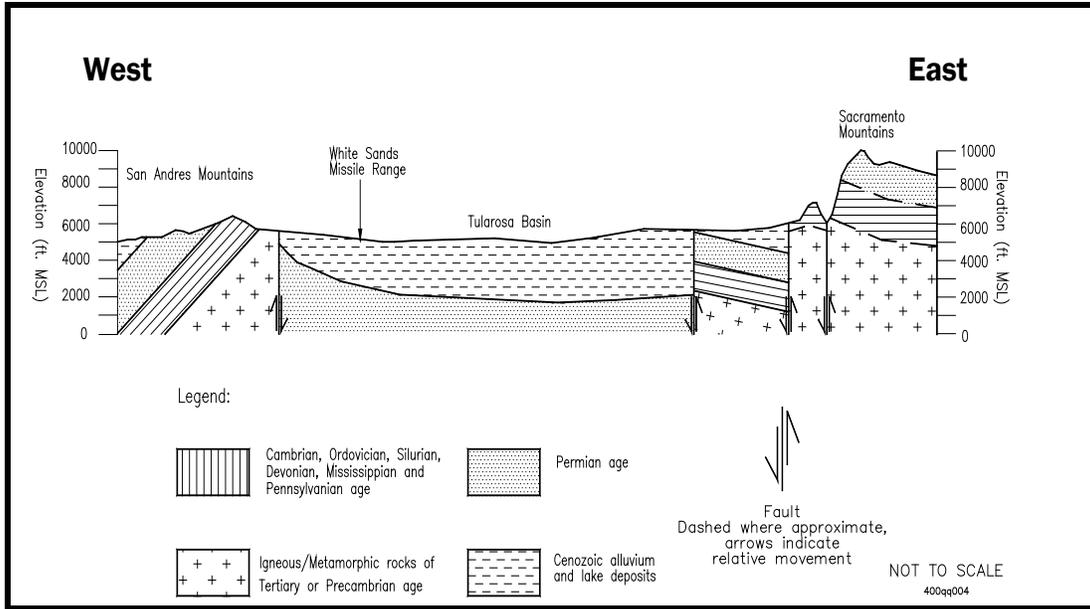
Originally established 9 July 1945 as White Sands Proving Ground, and later renamed White Sands Missile Range in 1958, the installation is situated within the Tularosa Basin; with areas along the western and northwestern boundary extending into the Jornada del Muerto Basin. The Range is located in the Dona Ana, Socorro, Lincoln, Otero, and Sierra Counties, New Mexico (NM). The Main Post area of White Sands is located at the southwestern corner of the installation, approximately 43 kilometers (km [27 miles (mi.)]) east-northeast of Las Cruces, NM. White Sands headquarters and most installation support activities are located at the Main Post area. White Sands Missile Range is the largest land-area military installation in the United States, comprised of nearly 5,631 Square Kilometers (sq. km [3,200 Square Miles (sq. mi.)]). The installation is approximately 159-km (99 mi.) long and 40 to 64-km (25 to 40 mi.) wide.

The New Mexico desert was selected to be the nation's testing range for several reasons: the desert is sparsely populated, has almost year-round clear weather and unlimited visibility, and as such, affords relatively easy recovery of spent missiles. The Range now functions as an outdoor laboratory consisting of a large complex of test ranges, launch sites, impact areas and instrumentation sites required to develop and test tactical and strategic weapons and weapons systems. White Sands is designated as a national range whose mission is the support of missile development and test programs for the Army, Navy, Air Force, National Aeronautics and Space Administration (NASA) and other government agencies.

### **1.1.2 Regional Geology**

White Sands Missile Range lies within the Mexican Highland Section of the Basin and Range Province, characterized by a series of tilted fault blocks forming longitudinal, asymmetric ridges or mountains and broad intervening basins (Figure 1-2). The major portion of the Range lies within the Tularosa Basin, bound on the west by the Organ, San Augustin, and San Andres Mountains. The eastern limit of the Tularosa Basin lies outside of the Range, and is formed from north to south by the Jicarilla, Sierra Blanca, and Sacramento Mountains (not shown on Figure 1-2).

The Tularosa Basin contains thick sequences of Tertiary and Quaternary age alluvial and bolson fill deposits. These sediments, more than 1,524 meters (m [5,000 feet (ft)]) thick in some areas, consist mainly of silt, sand, gypsum, and clay weathered from the surrounding mountain ranges. The average elevation of the basin floor is 1,219-m (4,000-ft) above mean sea level and surface features consist of flat sandy areas, sand dunes, basalt flows, and playas (dry lakebeds). The average elevation of the mountain ranges from 1,737-m (5,700-ft) at San Augustine Pass to more than 2,743-m (9,000-ft) at Salinas Peak, the highest elevation at White Sands.



**Figure 1-2. Generalized East-West Cross Section Across the Southern Part of the Tularosa Basin, North Of Highway 70, White Sands Missile Range**

The nature of the bolson-fill deposits varies both laterally and vertically throughout the Main Post Area. Coarse-grained, poorly sorted sediments deposited near mountain fronts grade into fine-grained, well-sorted sediments toward the center of the basin (Kelly, 1973). Sediments further from the mountains also contain a greater percentage of clay and gypsum. Vertically, the sediments are reported to become finer-grained and more consolidated until reaching a laterally continuous clay unit at about 304.8-m (1,000-ft) below ground surface (Kelly and Hearne, 1976).

### 1.1.3 Regional Hydrology

#### 1.1.3.1 Climatology

The elevation of White Sands Main Post is approximately 1,219-m (4,000-ft) above mean sea level. Snowfall is infrequent, although heavy snows have occurred. With an average annual rainfall of only 27.4-cm (10.8-in), mostly occurring during late summer thunderstorms, often accompanied by hail, the area is considered semi-arid. Intense localized thunderstorms have caused flash flooding in the past. The average summer high temperature is 33.3 °C (92 °F) with lows of about 18.3 °C (65 °F). During the winter months (December, January, and February), the average high is 13.9 °C (57 °F), with lows of about 2.2 °C (36 °F). Average annual humidity readings are approximately 37 percent.

#### 1.1.3.2 Surface Water

Very little surface water exists at White Sands due to the low annual precipitation, high evapotranspiration rates, and high infiltration characteristics of the soils. During the summer season when thunderstorm activity is most common, playas within the basin may contain standing water. Arroyos (intermittent watercourses), which facilitate runoff from the surrounding mountains, usually contain water only following heavy precipitation events.

### 1.1.3.3 Groundwater

The Main Post area is supplied with potable water from the aquifer in the upper bolson deposits. The majority of the groundwater recharge to this bolson aquifer occurs through the coarse, unconsolidated Tertiary/Quaternary alluvial fan deposits and arroyos along the eastern flanks of the Organ, San Augustin, and San Andres Mountains. This aquifer consists of a wedge-shaped belt of potable water more than 48.3-km (30 mi.) long (from north to south) and 4.8 to 8.0-km (3 to 5 mi.) east from the mountain front. Groundwater in the vicinity of the Main Post is of sufficient quality (less than 1,000-mg/L total dissolved solids) for human consumption. McClean (1970) reported this freshwater zone extends down to about 550-m (1,800-ft) below ground surface.

Recharge to the regional aquifer is from precipitation falling on the mountain ranges and alluvial fans that border the bolson on the west (White Sands, 1993b). This precipitation infiltrates the unconsolidated, relatively coarse deposits of the alluvial fans, and the resultant groundwater flows toward the center of the Tularosa Basin, generally in the east-southeasterly direction. However, groundwater flow direction within the western Tularosa Basin region is presumed to discharge to the south as underflow into the contiguous, northern Hueco Basin of western Texas. No surface expressions of groundwater discharge have been reported within the western Tularosa Basin. Dissolved constituents in groundwater increase with distance eastward from the mountain front, reflecting the increased residence time of groundwater moving from the western bolson margin toward the center of the Tularosa Basin.

### 1.1.4 Site Specific Geology and Hydrogeologic Conditions

Subsurface geologic conditions at the site were characterized from stratigraphic descriptions logged during soil boring activities. The unconsolidated deposits are characterized as alternating sequences of Quaternary/Tertiary sands, silts, and clays originating from the Organ Mountains. Groundwater flow direction is interpreted to be to the southeast, based on groundwater elevations (approx. 207-ft bgs) measured in the monitoring wells. Table 1-1 contains location and construction details for the four wells used for monitoring groundwater beneath the site. Figure 1-3 illustrates the location of the monitoring wells and the inferred potentiometric contours.

**Table 1-1.  
Location and Well Construction Data – Former Main Post Landfill No. 3.**

Well No.	Northing <sup>1</sup>	Easting <sup>1</sup>	Elevation <sup>2</sup> Brass Marker ft (meters)	Elevation <sup>2</sup> Top of PVC ft (meters)	Total <sup>3</sup> Well Depth ft (meters)	Screen Interval <sup>3</sup> ft (meters)
MW04	3579662.1	362971.401	4079.18 (1243.33)	4080.36 (1243.69)	268 (81.69)	241-266 (73.46-81.08)
MW05	3579228.22	363180.735	4055.31 (1236.06)	4056.72 (1236.49)	266 (80.16)	244-264 (74.37-80.47)
MW07	3579017.77	362965.656	4058.78 (1237.12)	4060.74 (1237.71)	263 (80.16)	233-263 (71.02-80.16)
MW08	3579239.37	362785.233	4075.92 (1242.34)	4077.95 (1242.95)	265 (80.77)	245-265 (74.68-80.77)

- Notes:
1. Universal Transverse Mercator Coordinate Systems, Zone 13, NAD83
  2. Elevations are based on North American Vertical Datum, 1988 (NAVD88)
  3. bgs - below ground surface

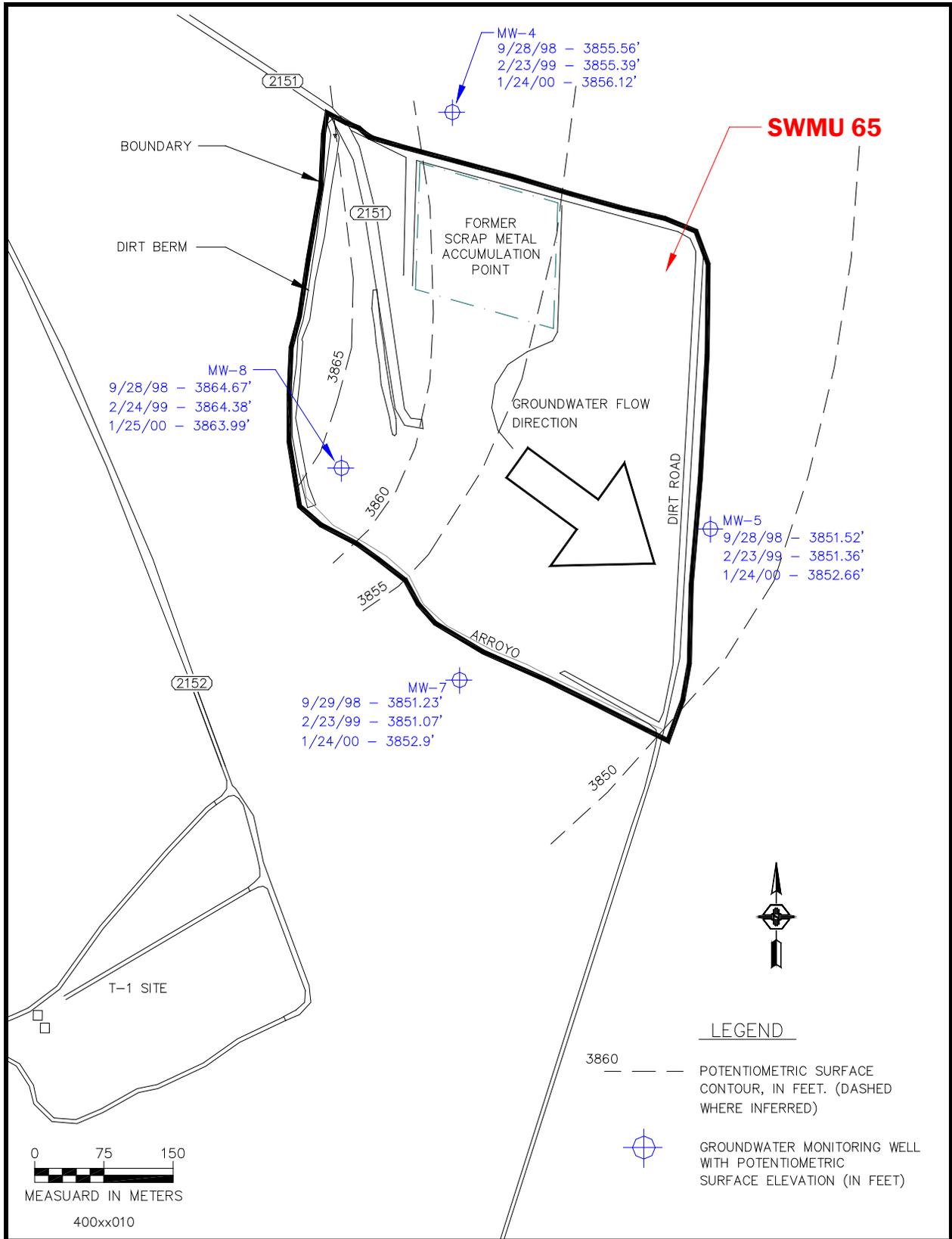


Figure 1-3. Former Main Post Landfill No. 3 Site Map.

## **1.2 Regulatory Requirements**

A Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) was conducted in August 1988 to identify SWMUs, Areas of Concern (AOC), and existing information on contaminant releases (US EPA, 1988). It also identified releases or suspected releases at sites that require further investigation.

Approximately 138 SWMU sites and AOCs were identified during the RFA. Following receipt of the RFA, EPA Region VI, as the lead regulatory agency, provided RCRA permit conditions and recommendations to WSMR authorities. These conditions included performing RCRA Facility Investigations (RFI) at 18 SWMU sites with suspected releases of concern, and implementing corrective measures, if required. The Former Main Post Landfill No. 3 was investigated during the following:

- Phase I RFI, performed by IT Corporation (1992)
- Phase II RFI, performed by Sverdrup Corporation (1994)

A complete description of each investigation is found in Section 2.2, Previous Investigations.

## **1.3 Other Regulatory Issues**

Based on the results of the investigations, corrective measures are not required at this site. However, any corrective measures that may have been selected as a result of these investigations would have been subject to the requirements of the New Mexico Hazardous Waste Act (NMSA 1978, Chapter 74-4-1 through 14), Title 20 of the New Mexico Administrative Code (NMAC), Chapter 4.1 (NMED, 1998), and Title 40 of the Code of Federal Regulations (CFR) Part 264 (HSWA).

## **2.0 SITE BACKGROUND**

### **2.1 Site Description and History**

The Former Main Post Landfill No. 3 is described as a trench-type, sanitary landfill where only “inert materials” were disposed. The landfill was in operation between 1965 and 1982, prior to the implementation of RCRA, and was closed due to the relatively shallow depth to groundwater below the unit (Sverdrup Environmental, Inc. [SvE], 1994). The area of concern is roughly 20 hectares (49 acres); however, the exact locations of the landfill trenches are unknown. No information is available regarding the size, design, construction, or operating procedures of the landfill.

### **2.2 Previous Investigations**

#### **2.2.1 RCRA Facility Assessment**

In 1988, A.T. Kearney performed a Preliminary Assessment/RCRA Facility Assessment (PA/RFA), assessing the MPLF#3. It was recommended that a RCRA Facility Investigation (RFI) and subsurface sampling be conducted to determine the constituents and the boundaries of the landfill.

**2.2.2 Phase I RFI**

A Phase I RFI was conducted by IT Corporation in March 1992. During the field investigation, a geomagnetic survey was conducted to delineate the landfill boundaries. Due to interference from the fenced scrap metal accumulation point, the northern boundary could not be determined.

Two monitoring wells were also installed by IT Corporation (MW-4, MW-5) at this time (see Figures 2-1, 2-2, and 2-3). The drilling mud and cuttings, and the groundwater from the wells were analyzed for the presence of metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPHs), metals, and cyanide. Groundwater analyses resulted in detection of barium at background concentrations and trace amounts of TPH considered to be the result of either well material leachate or from ambient air near freshly painted well encasements (see Table 2-1). All lab results from the analysis of the drilling mud and cuttings were reported at background levels (see Table 2-2).

**Table 2-1.  
Groundwater Analytical Results SWMU 65 RCRA Facility Investigation (RFI)  
Appendix I Sites White Sands Missile Range, New Mexico.**

CONSTITUENT <sup>(1)</sup>	UNITS OF MEASURE	SAMPLE ID*: UPGRADIENT/DOWNGRADE <sup>(2)</sup> : SAMPLE TYPE: SAMPLE DATE:			MW-4GWD DG Groundwater 05/31/91	MW-4GW DG Groundwater 05/31/91	MW-5GW DG Groundwater 05/31/91
		<b>MCL</b> <sup>(3)</sup>	<b>NM</b> <sup>(4)</sup>	<b>URTH</b> <sup>(5)</sup>			
INORGANICS							
Barium	mg/L	1 (2 on 1/1/93) <sup>(6)</sup>	1	NA	0.063	0.062	0.073
MISCELLANEOUS							
Total Petroleum Hydrocarbons	mg/L	NA	NA	NA	4.2	4.1	2.6

NOTES: \* = Sample identification nomenclature is described in 3.1.1 of Volume 1 of the RFI Report.  
Analytical values exceeding MCLs or New Mexico Regulatory levels are in bold type.  
(1) Only samples with constituent concentrations above the detection limit are noted.  
(2) Hydraulic gradient direction is assumed from historical data.  
(3) MCL = Maximum contaminant level in mg/L (from USEPA Safe Drinking Water Hotline, March 30, 1992, referencing 40 CFR dated July 1, 1991).  
(4) NM = New Mexico regulatory levels in mg/L (from "New Mexico Water Quality Control Commission Regulations," 1988).  
(5) URTH = Unreasonable Risk to Health (level in mg/L) as recommended by EPA (from October, 1990 "Guidance in Developing Health Criteria from Determining Unreasonable Risks to Health")  
(6) Proposed.  
NA = Not applicable.

**Table 2-2.  
Drilling Mud and Cuttings Analytical Results SWMU 65 RCRA Facility  
Investigation (RFI) Appendix I Sites White Sands Missile Range, New Mexico.**

CONSTITUENT <sup>(1)</sup>	UNITS OF MEASURE	SAMPLE ID*: SAMPLE TYPE: SAMPLE DATE:	<b>65 MUD Soil</b> <sup>(2)</sup> <b>06/01/91</b>
INORGANICS		<b>TC LEVEL</b> <sup>(3)</sup>	
Barium	mg/kg	2000	37
Chromium	mg/kg	100	2.3
Lead	mg/kg	100	4.0

NOTES: \* = Sample identification nomenclature is described in 3.1.1 of Volume 1 of the RFI Report.  
(1) Only samples with constituent concentrations above the detection limit are noted.  
(2) Sample is a composite of mud and cuttings from two wells.  
(3) From Toxicity Characteristic—Final Rule; values are 20 times the TC level in mg/L (see explanation in text).

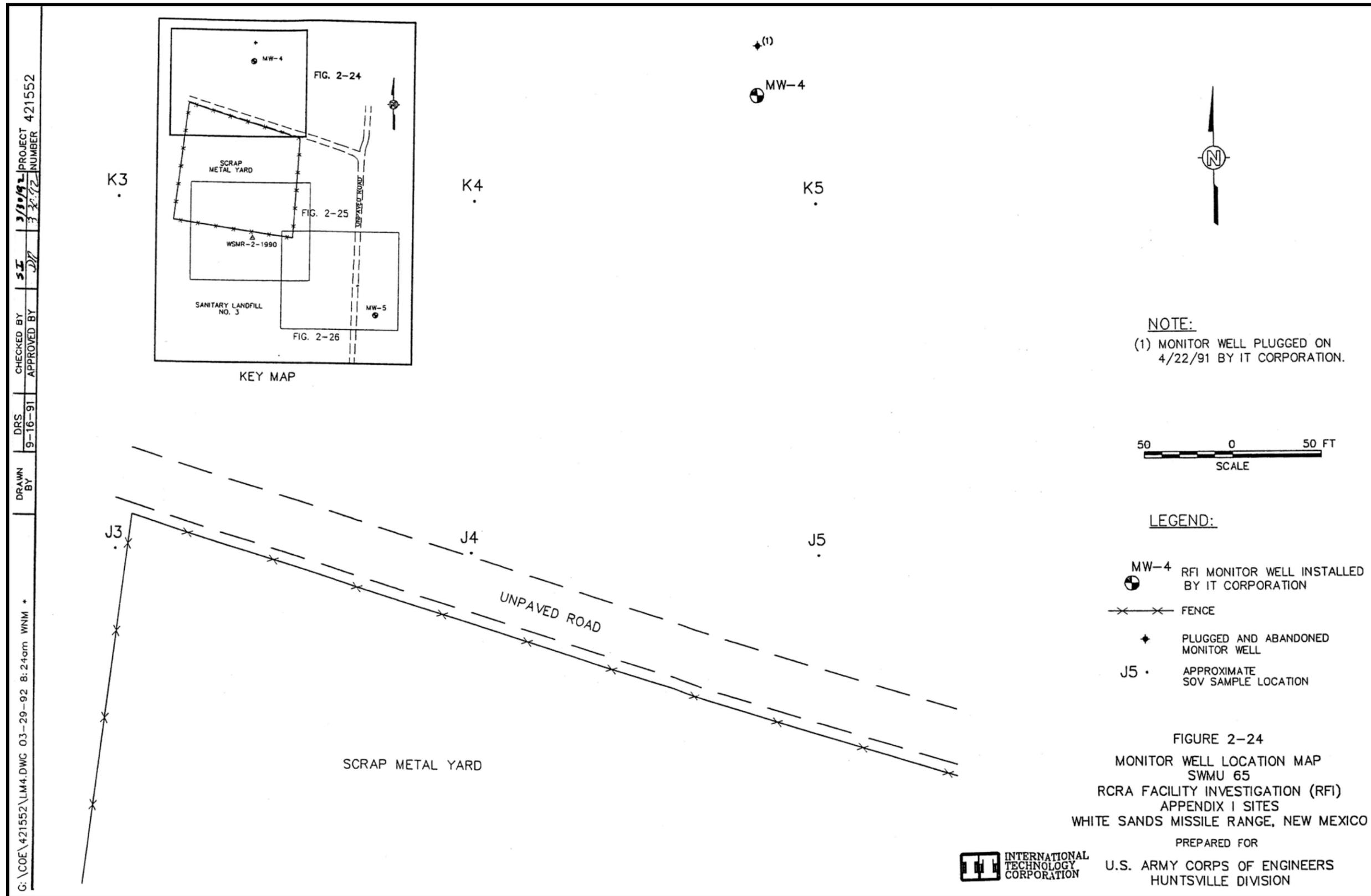


Figure 2-1. SWMU 65 Phase I RFI Monitoring Well (MW-04) Location Map.

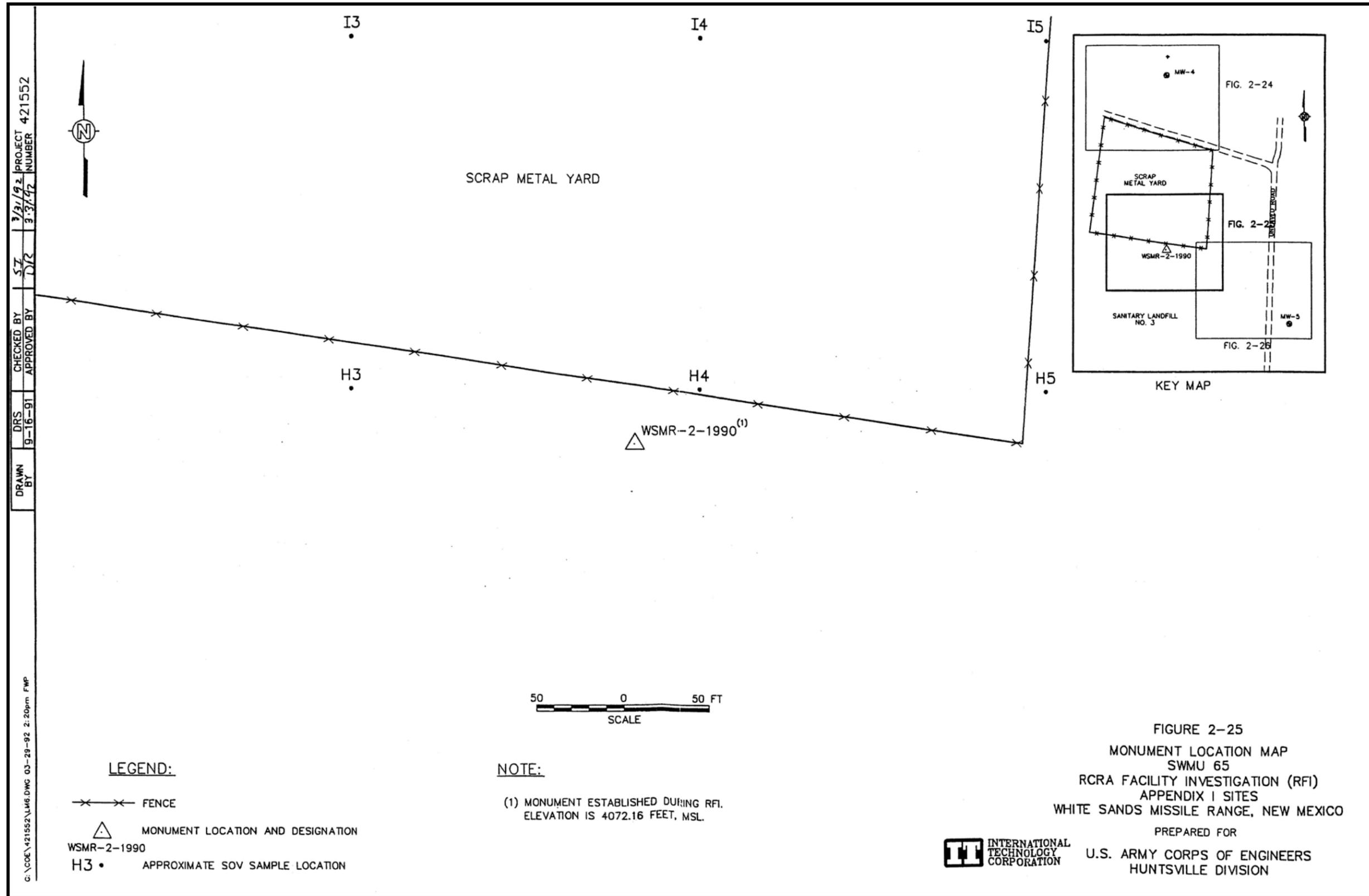


Figure 2-2. SWMU 65 Phase I RFI monument Location Map.

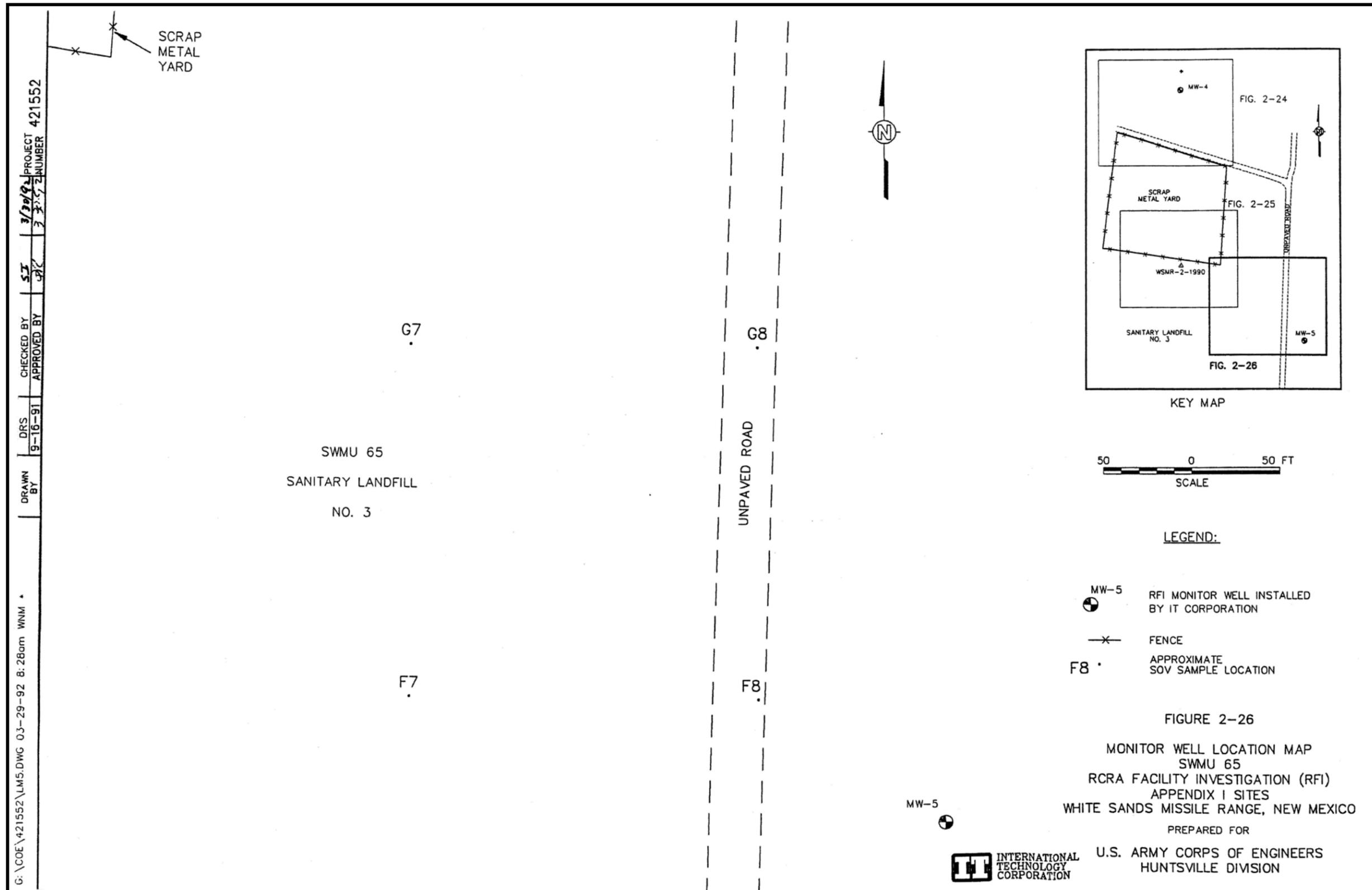


Figure 2-3. SWMU 65 Phase I RFI monitoring Well (MW-05) Location Map.

The soil vapor survey that was conducted during Phase I revealed a “hot spot” in the southeastern quarter of the suspected landfill area. IT Corporation recommended the following Phase II activities for this site:

- auger several soil borings in the “hot spot”,
- conduct a second phase soil vapor survey to assess horizontal limits of contamination, and
- to monitor MW-4 and MW-5 for Phase I constituents of concern (trace amounts of TPH and heavy metals, primarily barium).

### **2.2.3 Phase II RFI**

During December 1994, a Phase II RFI was conducted at MPLF#3 by Sverdrup Corp. A surface geophysical survey utilizing Ground Penetrating Radar (GPR) was planned in an attempt to delineate the extents of the landfill. However, the presence of gypsum in the soil causes interference with the GPR’s depth penetration thus reducing its effectiveness and the GPR survey was not performed. A soil gas survey was conducted during Phase II of the RFI, resulting in confirmation of the Phase I findings.

Forty soil samples were taken up to depths of 30 feet and analyzed for VOCs, SVOCs, TPH, and metals (see Figure 2-4). The soil boring logs indicated that the landfill depth ranged between 5.2 and 6.0-m (17 & 21-ft). Results of analysis revealed no constituents of concern above background levels (see Tables 2-3 thru 2-5). Two additional monitoring wells (MW-7, MW-8) were installed to increase the monitoring coverage at this site (see Figure 2-4). Groundwater samples were taken from all four monitoring wells (MW-4, MW-5, MW-7, and MW-8) and no constituents of concern exceeded their respective regulatory limits (see Tables 2-6 and 2-7).

The investigation indicated that a significant release of contaminants had not occurred and a request for a Class III permit modification should be submitted by WSMR to terminate the RFI for SWMU 65. However, it was recommended that SWMU 65 be monitored periodically due to its proximity to the freshwater aquifer utilized by WSMR.

### **2.2.4 Groundwater Quality Investigation Report**

In April 1996, Environmental Science and Engineering (ESE) conducted a Groundwater Quality Investigation. Dedicated submersible pumps were installed in all four of the groundwater monitoring wells at the site. Groundwater samples were collected and analyzed for VOCs, SVOCs, metals, total dissolved solids (TDS), and organochlorine pesticides/polychlorinated biphenols (PCBs). One sample was also analyzed for Nitrogen, polycyclic aromatic hydrocarbons (PAHs), 1,2 dibromoethane (EDB), radionuclides, and other inorganics. No constituents were detected, at concentrations exceeding any federal or state regulatory limits (see Table 2-8).

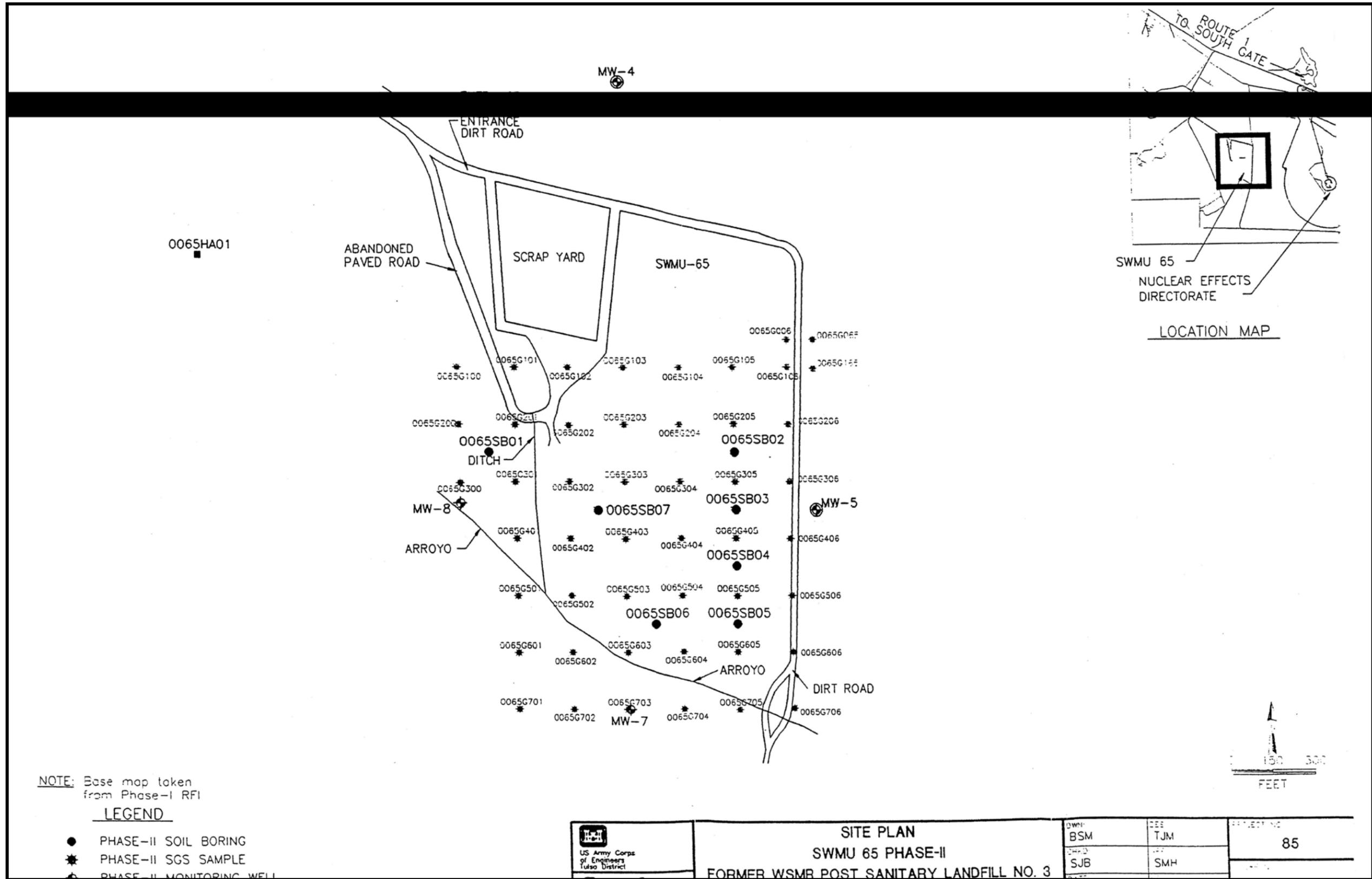


Figure 2-4. SWMU 65 Phase II RFI Soil Sample Location Map.

**Table 2-3. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Volatiles.**

<b>CONSTITUENT (Units in ug/kg)</b>	<b>Site Sample ID Date Depth (ft)</b>	<b>0065SB01 0065SB01 (004.0) 12/05/93 4.0</b>	<b>0065SB01 0065SB01 (009.0) 12/05/93 9.0</b>	<b>0065SB01 0065SB01 (014.0) 12/05/93 14.0</b>	<b>0065SB01 0065SB01 (019.0) 12/05/93 19.0</b>	<b>0065SB01 0065SB01 (024.0) 12/05/93 24.0</b>	<b>0065SB01 0065SB01 (028.5) 12/05/93 28.5</b>
Methylene chloride		<5.06	<5.16	<5.08	<5.06	<5.15	<5.03
Toluene		<5.06	<5.16	<5.08	<5.06	<5.15	<5.03
Ethyl benzene		<5.06	<5.16	<5.08	<5.06	<5.15	<5.03
Total Xylenes		<5.06	<5.16	<5.08	<5.06	<5.15	<5.03
1,4-Dichlorobenzene		<5.06	<5.16	<5.08	<5.06	<5.15	<5.03
Acetone		<20.2	<20.7	<20.3	<20.2	<20.6	<20.1
Carbon disulfide		<5.06	<5.16	<5.08	<5.06	<5.15	<5.03
2-Butanone		<20.2	<20.7	<20.3	<20.2	<20.6	<20.1
Styrene		<5.06	<5.16	<5.08	<5.06	<5.15	<5.03
<b>CONSTITUENT (Units in ug/kg)</b>	<b>Site Sample ID Date Depth (ft)</b>	<b>0065SB02 0065SB02 (004.0) 12/06/93 4.0</b>	<b>0065SB02 0065SB02 (014.0) 12/06/93 14.0</b>	<b>0065SB02 0065SB02 (019.0) 12/06/93 19.0</b>	<b>0065SB02 0065SB02 (024.0) 12/06/93 24.0</b>	<b>0065SB02 0065SB02 (029.0) 12/06/93 29.0</b>	<b>0065SB03 0065SB03 (004.0) 12/06/93 4.0</b>
Methylene chloride		<5.08	<5.05	<5.18	<5.04	<5.05	<5.08
Toluene		<5.08	<5.05	<5.18	<5.04	<5.05	<5.08
Ethyl benzene		<5.08	<5.05	<5.18	<5.04	<5.05	<5.08
Total Xylenes		<5.08	<5.05	<5.18	<5.04	<5.05	<5.08
1,4-Dichlorobenzene		<5.08	<5.05	<5.18	<5.04	<5.05	<5.08
Acetone		<20.3	<20.2	<20.7	<20.2	<20.2	<20.3
Carbon disulfide		<5.08	<5.05	<5.18	<5.04	<5.05	<5.08
2-Butanone		<20.3	<20.2	<20.7	<20.2	<20.2	<20.3
Styrene		<5.08	<5.05	<5.18	<5.04	<5.05	<5.08

Values represent total concentrations unless noted

&lt; = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-3. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Volatiles.**  
(continued)

CONSTITUENT (Units in ug/kg)	Site Sample ID Date Depth (ft)	0065SB03	0065SB03	0065SB03	0065SB03	0065SB03	0065SB04
		0065SB03 (009.0) 12/05/93 9.0	0065SB03 (015.0) 12/05/93 15.0	0065SB03 (018.0) 12/05/93 18.0	0065SB03 (024.0) 12/05/93 24.0	0065SB03 (029.0) 12/05/93 29.0	0065SB04 (004.0) 12/05/93 4.0
Methylene chloride		<5.25	6.69	<5.10 UJ	<5.20	<5.08	<5.11
Toluene		16.7	18.3	<5.10 UJ	<5.20	<5.08	<5.11
Ethyl benzene		12.4	19.6	<5.10 UJ	<5.20	<5.08	<5.11
Total Xylenes		46.0	88.6	<5.10 UJ	<5.20	<5.08	<5.11
1,4-Dichlorobenzene		<5.25	27.5	<5.10 UJ	<5.20	<5.08	<5.11
Acetone		592.	249	<20.4 UJ	<20.8	<20.3	<20.4
Carbon disulfide		8.61	<5.14	<5.10 UJ	<5.20	<5.08	<5.11
2-Butanone		236.	348.2	<20.4 UJ	<20.8	<20.3	<20.4
Styrene		5.99	<5.14	<5.10 UJ	<5.20	<5.08	<5.11
CONSTITUENT (Units in ug/kg)	Site Sample ID Date Depth (ft)	0065SB04	0065SB04	0065SB04	0065SB04	0065SB05	0065SB05
		0065SB04 (014.0) 12/05/93 14.0	0065SB04 (018.0) 12/05/93 18.0	0065SB04 (024.0) 12/05/93 24.0	0065SB04 (029.0) 12/05/93 29.0	0065SB05 (004.0) 12/06/93 4.0	0065SB05 (010.0) 12/06/93 10.0
Methylene chloride		<5.34	<5.27	<5.26	<5.08	<5.07	<5.29
Toluene		<5.34	<5.27	<5.26	<5.08	<5.07	12.6
Ethyl benzene		<5.34	<5.27	<5.26	<5.08	<5.07	8.89
Total Xylenes		<5.34	<5.27	<5.26	<5.08	<5.07	30.2
1,4-Dichlorobenzene		204.	<5.27	<5.26	<5.08	<5.07	22.8
Acetone		103 J	<21.1	<21.0	<20.3	<20.3	928.
Carbon disulfide		<5.34	<5.27	<5.26	<5.08	<5.07	<5.29
2-Butanone		96.3 J	<21.1	<21.0	<20.3	<20.3	183
Styrene		<5.34	<5.27	<5.26	<5.08	<5.07	<5.29

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-3. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Volatiles.**  
(continued)

CONSTITUENT (Units in ug/kg)	Site Sample ID Date Depth (ft)	0065SB05 0065SB05 (015.0) 12/06/93 15.0	0065SB05 0065SB05 (019.0) 12/06/93 19.0	0065SB05 0065SB05 (024.0) 12/06/93 24.0	0065SB05 0065SB05 (029.0) 12/06/93 29.0	0065SB06 0065SB06 (008.5) 12/06/93 8.5	0065SB06 0065SB06 (014.0) 12/06/93 14.0
Methylene chloride		14.4	<5.12	<5.09	<5.10	<5.06	<5.09
Toluene		70.2	5.94	<5.09	<5.10	9.11	<5.09
Ethyl benzene		201	9.43	<5.09	<5.10	<5.06	<5.09
Total Xylenes		920	44.2	<5.09	<5.10	<5.06	<5.09
1,4-Dichlorobenzene		322	38.2	<5.09	<5.10	<5.06	<5.09
Acetone		2360	212.	<20.4	<20.4	74.9	901.
Carbon disulfide		<5.20	<5.12	<5.09	<5.10	<5.06	8.85
2-Butanone		232	32.8	<20.4	<20.4	<20.2	205.
Styrene		47.1	<5.12	<5.09	<5.10	<5.06	<5.09
CONSTITUENT (Units in ug/kg)	Site Sample ID Date Depth (ft)	0065SB06 0065SB06 (019.0) 12/06/93 19.0	0065SB06 0065SB06 (024.0) 12/06/93 24.0	0065SB06 0065SB06 (029.0) 12/06/93 29.0	0065SB07 0065SB07 (004.0) 12/05/93 4.0	0065SB07 0065SB07 (009.0) 12/05/93 9.0	0065SB07 0065SB07 (014.0) 12/05/93 14.0
Methylene chloride		<5.21	<5.08	<5.09	<5.16 UJ	<5.06	<5.19
Toluene		<5.21	<5.08	<5.09	<5.16 UJ	<5.06	<5.19
Ethyl benzene		<5.21	<5.08	<5.09	<5.16 UJ	<5.06	<5.19
Total Xylenes		<5.21	<5.08	<5.09	<5.16 UJ	<5.06	<5.19
1,4-Dichlorobenzene		<5.21	<5.08	<5.09	<5.16 UJ	<5.06	<5.19
Acetone		<20.8	<20.3	<20.4	<20.7 UJ	<20.2	901.
Carbon disulfide		<5.21	<5.08	<5.09	<5.16 UJ	<5.06	<5.19
2-Butanone		<20.8	<20.3	<20.4	<20.7 UJ	<20.2	205.
Styrene		<5.21	<5.08	<5.09	<5.16 UJ	<5.06	<5.19

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-3. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Volatiles.  
(concluded)**

CONSTITUENT (Units in ug/kg)	Site Sample ID Date Depth (ft)	0065SB07 0065SB07 (019.0) 12/05/93 19.0	0065SB07 0065SB07 (024.0) 12/05/93 24.0	0065SB07 0065SB07 (028.5) 12/05/93 28.5			
Methylene chloride		<5.31	<5.19	<5.06			
Toluene		<5.31	<5.19	<5.06			
Ethyl benzene		<5.31	<5.19	<5.06			
Total Xylenes		<5.31	<5.19	<5.06			
1,4-Dichlorobenzene		<5.31	<5.19	<5.06			
Acetone		<21.2	<20.8	<20.2			
Carbon disulfide		<5.31	<5.19	<5.06			
2-Butanone		<21.2	<20.8	<20.2			
Styrene		<5.31	<5.19	<5.06			

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-4. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Semi-Volatiles.**

CONSTITUENT	Site Sample ID Date Depth (ft)	0065SB01 0065SB01 (004.0) 12/05/93 4.0	0065SB01 0065SB01 (009.0) 12/05/93 9.0	0065SB01 0065SB01 (014.0) 12/05/93 14.0	0065SB01 0065SB01 (019.0) 12/05/93 19.0	0065SB01 0065SB01 (024.0) 12/05/93 24.0	0065SB01 0065SB01 (028.5) 12/05/93 28.5
Phenol	(ug/kg)	<334	<341	<335	<334	<340	<332
Benzyl alcohol	(ug/kg)	<334	<341	<335	<334	<340	<332
2-Methylaphthalene	(ug/kg)	<334	<341	<335	<334	<340	<332
Dibenzofuran	(ug/kg)	<334	<341	<335	<334	<340	<332
1,4-Dichlorobenzene	(ug/kg)	<334	<341	<335	<334	<340	<332
Naphthalene	(ug/kg)	<334	<341	<335	<334	<340	<332
Acenaphthene	(ug/kg)	<334	<341	<335	<334	<340	<332
Fluorene	(ug/kg)	<334	<341	<335	<334	<340	<332
Phenanthrene	(ug/kg)	<334	<341	<335	<334	<340	<332
Anthracene	(ug/kg)	<334	<341	<335	<334	<340	<332
Di-n-butylphthalate	(ug/kg)	<334	<341	<335	<334	<340	<332
Fluoranthene	(ug/kg)	<334	<341	<335	<334	<340	<332
Pyrene	(ug/kg)	<334	<341	<335	<334	<340	<332
Butylbenzylphthalate	(ug/kg)	<334	<341	<335	<334	<340	<332
Bis(2-ethylhexyl)phthalate	(ug/kg)	<334	<341	<335	<334	<340	<332
Benzo(k)fluoranthene	(ug/kg)	<334	<341	<335	<334	<340	<332
Benzo(a)pyrene	(ug/kg)	<334	<341	<335	<334	<340	<332
Total Pet. Hydrocarbons-IR	(mg/kg)	79.9	<31.0	<30.4	<30.4	<30.9	<30.2

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-4. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Semi-Volatiles.**  
(continued)

CONSTITUENT	Site Sample ID Date Depth (ft)	0065SB02 0065SB02 (004.0) 12/06/93 4.0	0065SB02 0065SB02 (014.0) 12/06/93 14.0	0065SB02 0065SB02 (019.0) 12/06/93 19.0	0065SB02 0065SB02 (024.0) 12/06/93 24.0	0065SB02 0065SB02 (029.0) 12/06/93 29.0	0065SB03 0065SB03 (004.0) 12/06/93 4.0
Phenol	(ug/kg)	<335.	<333.	<342	<333	<333.	<335
Benzyl alcohol	(ug/kg)	<335.	<333.	<342	<333	<333.	<335
2-Methylaphthalene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Dibenzofuran	(ug/kg)	<335	<333.	<342	<333	<333.	<335
1,4-Dichlorobenzene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Naphthalene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Acenaphthene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Fluorene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Phenanthrene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Anthracene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Di-n-butylphthalate	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Fluoranthene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Pyrene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Butylbenzylphthalate	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Bis(2-ethylhexyl)phthalate	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Benzo(k)fluoranthene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Benzo(a)pyrene	(ug/kg)	<335	<333.	<342	<333	<333.	<335
Total Pet. Hydrocarbons-IR	(mg/kg)	56.8	<30.3	<31.0	<30.2	<30.3	<30.5

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-4. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Semi-Volatiles.**  
(continued)

CONSTITUENT	Site Sample ID Date Depth (ft)	0065SB03 0065SB03 (009.0) 12/05/93 9.0	0065SB03 0065SB03 (015.0) 12/05/93 15.0	0065SB03 0065SB03 (018.0) 12/05/93 18.0	0065SB03 0065SB03 (024.0) 12/05/93 24.0	0065SB03 0065SB03 (029.0) 12/05/93 29.0	0065SB04 0065SB04 (004.0) 12/05/93 4.0
Phenol	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Benzyl alcohol	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
2-Methylaphthalene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Dibenzofuran	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
1,4-Dichlorobenzene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Naphthalene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Acenaphthene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Fluorene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Phenanthrene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Anthracene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Di-n-butylphthalate	(ug/kg)	<347	n/a	<337	<343.	<335.	570
Fluoranthene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Pyrene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Butylbenzylphthalate	(ug/kg)	<347	n/a	340	<343.	<335.	<337
Bis(2-ethylhexyl)phthalate	(ug/kg)	<347	n/a	582	<343.	<335.	<337
Benzo(k)fluoranthene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Benzo(a)pyrene	(ug/kg)	<347	n/a	<337	<343.	<335.	<337
Total Pet. Hydrocarbons-IR	(mg/kg)	4360	167	152.	<31.2	<30.5	<30.6

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-4. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Semi-Volatiles.**  
(continued)

CONSTITUENT	Site Sample ID Date Depth (ft)	0065SB04 0065SB04 (014.0) 12/05/93 14.0	0065SB04 0065SB04 (018.0) 12/05/93 18.0	0065SB04 0065SB04 (024.0) 12/05/93 24.0	0065SB04 0065SB04 (029.0) 12/05/93 29.0	0065SB05 0065SB05 (004.0) 12/06/93 4.0	0065SB05 0065SB05 (010.0) 12/06/93 10.0
Phenol	(ug/kg)	<352.	<348	<347.	<335.	<335	<349.
Benzyl alcohol	(ug/kg)	<352.	<348	<347.	<335.	<335	<349.
2-Methylaphthalene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349.
Dibenzofuran	(ug/kg)	<352.	<348	<347.	<335.	<335	<349.
1,4-Dichlorobenzene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Naphthalene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Acenaphthene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Fluorene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Phenanthrene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Anthracene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Di-n-butylphthalate	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Fluoranthene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Pyrene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Butylbenzylphthalate	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Bis(2-ethylhexyl)phthalate	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Benzo(k)fluoranthene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Benzo(a)pyrene	(ug/kg)	<352.	<348	<347.	<335.	<335	<349. UJ
Total Pet. Hydrocarbons-IR	(mg/kg)	203	<31.6	<31.6	<30.5	<30.4	<324

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-4. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Semi-Volatiles.**  
(continued)

CONSTITUENT	Site Sample ID Date Depth (ft)	0065SB05 0065SB05 (015.0) 12/06/93 15.0	0065SB05 0065SB05 (019.0) 12/06/93 19.0	0065SB05 0065SB05 (024.0) 12/06/93 24.0	0065SB05 0065SB05 (029.0) 12/06/93 29.0	0065SB06 0065SB06 (008.5) 12/06/93 8.5	0065SB06 0065SB06 (014.0) 12/06/93 14.0
Phenol	(ug/kg)	1970	<338.	<336.	<337	<334.	<336
Benzyl alcohol	(ug/kg)	3510	<338.	<336.	<337	<334.	<336
2-Methylaphthalene	(ug/kg)	525.	<338.	<336.	<337	<334.	<336
Dibenzofuran	(ug/kg)	398.	<338.	<336.	<337	<334.	<336
1,4-Dichlorobenzene	(ug/kg)	357	<338.	<336.	<337	<334.	<336
Naphthalene	(ug/kg)	708	<338.	<336.	<337	<334.	<336
Acenaphthene	(ug/kg)	604	<338.	<336.	<337	<334.	<336
Fluorene	(ug/kg)	1090	<338.	<336.	<337	<334.	<336
Phenanthrene	(ug/kg)	8210	<338.	<336.	<337	<334.	<336
Anthracene	(ug/kg)	1890	<338.	<336.	<337	<334.	<336
Di-n-butylphthalate	(ug/kg)	<343.	<338.	<336.	<337	<334.	<336
Fluoranthene	(ug/kg)	6420	<338.	<336.	<337	<334.	<336
Pyrene	(ug/kg)	3610	<338.	<336.	<337	<334.	<336
Butylbenzylphthalate	(ug/kg)	364.	<338.	<336.	<337	<334.	<336
Bis(2-ethylhexyl)phthalate	(ug/kg)	<343.	<338.	<336.	<337	886	<336
Benzo(k)fluoranthene	(ug/kg)	1560	<338.	<336.	<337	<334.	<336
Benzo(a)pyrene	(ug/kg)	1060	<338.	<336.	<337	<334.	<336
Total Pet. Hydrocarbons-IR	(mg/kg)	13000	971.	<30.5	<30.6	202.	80.4

Values represent total concentrations unless noted

< = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-4. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Semi-Volatiles.**  
(continued)

CONSTITUENT	Site Sample ID Date Depth (ft)	0065SB06 0065SB06 (019.0) 12/06/93 19.0	0065SB06 0065SB06 (024.0) 12/06/93 24.0	0065SB06 0065SB06 (029.0) 12/06/93 29.0	0065SB07 0065SB07 (004.0) 12/05/93 4.0	0065SB07 0065SB07 (009.0) 12/05/93 9.0	0065SB07 0065SB07 (014.0) 12/05/93 14.0
Phenol	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Benzyl alcohol	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
2-Methylaphthalene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Dibenzofuran	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
1,4-Dichlorobenzene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Naphthalene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Acenaphthene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Fluorene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Phenanthrene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Anthracene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Di-n-butylphthalate	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Fluoranthene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Pyrene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Butylbenzylphthalate	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Bis(2-ethylhexyl)phthalate	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Benzo(k)fluoranthene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Benzo(a)pyrene	(ug/kg)	<344	<335.	<336.	<341	<334	<342.
Total Pet. Hydrocarbons-IR	(mg/kg)	<31.2	<30.4	<30.5	<31.0	<30.3	<31.1

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-4. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Semi-Volatiles.  
(concluded)**

CONSTITUENT	Site Sample ID Date Depth (ft)	0065SB07 0065SB07 (019.0) 12/05/93 19.0	0065SB07 0065SB07 (024.0) 12/05/93 24.0	0065SB07 0065SB07 (028.5) 12/05/93 28.5			
Phenol	(ug/kg)	<350.	<343 UJ	<334			
Benzyl alcohol	(ug/kg)	<350.	<343 UJ	<334			
2-Methylaphthalene	(ug/kg)	<350.	<343 UJ	<334			
Dibenzofuran	(ug/kg)	<350.	<343 UJ	<334			
1,4-Dichlorobenzene	(ug/kg)	<350.	<343	<334			
Naphthalene	(ug/kg)	<350.	<343	<334			
Acenaphthene	(ug/kg)	<350.	<343	<334			
Fluorene	(ug/kg)	<350.	<343	<334			
Phenanthrene	(ug/kg)	<350.	<343	<334			
Anthracene	(ug/kg)	<350.	<343	<334			
Di-n-butylphthalate	(ug/kg)	<350.	<343	<334			
Fluoranthene	(ug/kg)	<350.	<343	<334			
Pyrene	(ug/kg)	<350.	<343	<334			
Butylbenzylphthalate	(ug/kg)	<350.	<343	<334			
Bis(2-ethylhexyl)phthalate	(ug/kg)	<350.	<343	<334			
Benzo(k)fluoranthene	(ug/kg)	<350.	<343	<334			
Benzo(a)pyrene	(ug/kg)	<350.	<343	<334			
Total Pet. Hydrocarbons-IR	(mg/kg)	<31.8	<31.2	<30.3			

Values represent total concentrations unless noted

< = Not detected at indicated reporting limit

n/a = Not analyzed

Table 2-5. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Metals.

CONSTITUENT (Units in mg/kg)	Site Sample ID Date Depth (ft)	0065HA01 0065HA01 (000.0) 01/07/94 0.0	0065SB01 0065SB01 (004.0) 12/05/93 4.0	0065SB01 0065SB01 (009.0) 12/05/93 9.0	0065SB01 0065SB01 (014.0) 12/05/93 14.0	0065SB01 0065SB01 (019.0) 12/05/93 19.0	0065SB01 0065SB01 (024.0) 12/05/93 24.0
Arsenic		<2.68	3.68	<2.58	4.44	<2.23	<2.57
Barium		84.6	118.	74.1	46.9	151	75.0
Cadmium		6.43	<5.06	<5.16	<5.08	<5.06	<5.15
Lead		7.30	8.92	9.30	7.59	5.99	11.1
Mercury		<0.0214 UJ	<0.0202	<0.0207	<0.0203	<0.0202	<0.0206
CONSTITUENT (Units in mg/kg)	Site Sample ID Date Depth (ft)	0065SB01 0065SB01 (028.5) 12/05/93 28.5	0065SB02 0065SB02 (004.0) 12/06/93 4.0	0065SB02 0065SB02 (014.0) 12/06/93 14.0	0065SB02 0065SB02 (019.0) 12/06/93 19.0	0065SB02 0065SB02 (024.0) 12/06/93 24.0	0065SB02 0065SB02 (029.0) 12/06/93 29.0
Arsenic		<2.52	<2.54	<2.52	<2.59	<2.52	<2.52
Barium		<2.52	31.5	<25.2	84.8	<25.2	41.5
Cadmium		<5.03	<5.08	<5.05	<5.18	<5.06	<5.05
Lead		7.38	8.66	7.62	12.2	5.04	8.16
Mercury		<0.0201	<0.0203	<0.0202	<0.0414	<0.0202	<0.0202
CONSTITUENT (Units in mg/kg)	Site Sample ID Date Depth (ft)	0065SB03 0065SB03 (004.0) 12/05/93 4.0	0065SB03 0065SB03 (009.0) 12/05/93 9.0	0065SB03 0065SB03 (015.0) 12/05/93 15.0	0065SB03 0065SB03 (018.0) 12/05/93 18.0	0065SB03 0065SB03 (024.0) 12/05/93 24.0	0065SB03 0065SB03 (029.0) 12/05/93 29.0
Arsenic		3.41	2.63	<2.57	5.49	<2.60	3.34
Barium		61.7	67.8	44.0	71.2	49.1	<25.4
Cadmium		<5.08	<5.25	<5.14	<5.10	<5.20	<5.08
Lead		9.79	26.5	16.4	13.8	7.93	8.61
Mercury		<0.0203	<0.0945	<0.0617	<0.0306	<0.0208	<0.0203

Values represent total concentrations unless noted &lt; = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-5. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Metals.**  
(continued)

CONSTITUENT (Units in mg/kg)	Site Sample ID Date Depth (ft)	0065SB04 0065SB04 (004.0) 12/05/93 4.0	0065SB04 0065SB04 (014.0) 12/05/93 14.0	0065SB04 0065SB04 (018.0) 12/05/93 18.0	0065SB04 0065SB04 (024.0) 12/05/93 24.0	0065SB04 0065SB04 (029.0) 12/05/93 29.0	0065SB05 0065SB05 (004.0) 12/06/93 4.0
Arsenic		<2.55	<2.67	<2.63	<2.63	<2.54	<2.54
Barium		65.7	70.8	77.6	88.0	<25.4	40.0
Cadmium		<5.11	<5.34	<5.27	<5.26	<5.08	<5.07
Lead		8.82	85.6	11.1	9.53	6.44	8.81
Mercury		<0.0204	<0.0748	<0.0211	<0.0210	<0.0203	<0.0203
CONSTITUENT (Units in mg/kg)	Site Sample ID Date Depth (ft)	0065SB05 0065SB05 (010.0) 12/06/93 10.0	0065SB05 0065SB05 (015.0) 12/06/93 15.0	0065SB05 0065SB05 (019.0) 12/06/93 19.0	0065SB05 0065SB05 (024.0) 12/06/93 24.0	0065SB05 0065SB05 (029.0) 12/06/93 29.0	0065SB06 0065SB06 (008.5) 12/06/93 8.5
Arsenic		<2.64	4.55	<2.56	4.18	<2.55	<2.53
Barium		<26.4	41.2	51.0	105	44.9	46.6
Cadmium		<5.29	<5.20	<5.12	<5.09	<5.10	<5.06
Lead		5.74	35.1	31.8	7.85	12.2	9.30
Mercury		<0.0317	<0.0936	<0.0717	<0.0204	<0.0204	<0.0708
CONSTITUENT (Units in mg/kg)	Site Sample ID Date Depth (ft)	0065SB05 0065SB05 (010.0) 12/06/93 10.0	0065SB05 0065SB05 (015.0) 12/06/93 15.0	0065SB05 0065SB05 (019.0) 12/06/93 19.0	0065SB05 0065SB05 (024.0) 12/06/93 24.0	0065SB05 0065SB05 (029.0) 12/06/93 29.0	0065SB06 0065SB06 (008.5) 12/06/93 8.5
Arsenic		<2.64	4.55	<2.56	4.18	<2.55	<2.53
Barium		<26.4	41.2	51.0	105	44.9	46.6
Cadmium		<5.29	<5.20	<5.12	<5.09	<5.10	<5.06
Lead		5.74	35.1	31.8	7.85	12.2	9.30
Mercury		<0.0317	<0.0936	<0.0717	<0.0204	<0.0204	<0.0708

Values represent total concentrations unless noted

< = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-5. WSMR Phase-II RFI SWMU 65 Soil Analysis Detected Metals.**  
(concluded)

CONSTITUENT (Units in mg/kg)	Site Sample ID Date Depth (ft)	0065SB06 0065SB06 (014.0) 12/06/93 14.0	0065SB06 0065SB06 (019.0) 12/06/93 19.0	0065SB06 0065SB06 (024.0) 12/06/93 24.0	0065SB06 0065SB06 (029.0) 12/06/93 29.0	0065SB07 0065SB07 (004.0) 12/05/93 4.0	0065SB07 0065SB07 (009.0) 12/05/93 9.0
Arsenic		<2.54	<2.60	<2.54	<2.54	3.685	<2.53
Barium		51.94	266	3970	65.5	92.8	<25.3
Cadmium		<5.09	<5.21	<5.08	<5.09	<5.16	<5.06
Lead		10.2	10.4	9.32	14.2	8.99	5.16
Mercury		<0.0203	<0.0208	<0.0203	<0.0204	<0.0207	<0.0202
CONSTITUENT (Units in mg/kg)	Site Sample ID Date Depth (ft)	0065SB07 0065SB07 (014.0) 12/05/93 14.0	0065SB07 0065SB07 (019.0) 12/05/93 19.0	0065SB07 0065SB07 (024.0) 12/05/93 24.0	0065SB07 0065SB07 (028.5) 12/05/93 28.5		
Arsenic		<2.59	<2.65	<2.60	<2.53		
Barium		44.94	57.6	<26.0	<25.3		
Cadmium		<5.19	<5.31	<5.19	<5.06		
Lead		6.93	10.6	9.44	4.66		
Mercury		<0.0207	<0.0212	<0.0208	<0.0202		

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-6. WSMR Phase-II RFI SWMU 65 Groundwater Analysis Detected Volatiles**

CONSTITUENT (Units in ug/L)	Site Sample ID Date	0065MW04 0065MW04 (WTR) 01/20/94	0065MW05 0065MW05 (WTR)RS 01/19/94	0065MW07 0065MW07 (WTR) 01/19/94	0065MW08 0065MW08 (WTR) 01/18/94	0065PW01 0065PW01 (WTR) 11/18/93
1,1-Dichloroethene		<5	<5	5.10 J	<5 UJ	<5 UJ
1,1,1-Trichloroethane		<5	<5	6.20 J	<5 UJ	<5 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit

n/a = Not analyzed

Table 2-7. WSMR Phase-II RFI SWMU 65 Groundwater Analysis Detected Metals.

CONSTITUENT	Site Sample ID Date	0065MW04 0065MW04 (WTR) 01/20/94	0065MW05 0065MW05 (WTR) RS 01/19/94	0065MW07 0065MW07 (WTR) 01/19/94	0065MW08 0065MW08 (WTR) 01/18/94	0065PW01 0065PW01 (WTR) 11/18/93
Arsenic	(ug/L)	<5	<5	<5	<5	<5
Arsenic (Dissolved)	(ug/L)	<5	6	<5	<5	n/a
Barium	(ug/L)	70	120	90	124	200
Barium (Dissolved)	(ug/L)	<50	70	<50	<50	n/a
Cadmium	(ug/L)	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5
Cadmium (Dissolved)	(ug/L)	<5	<5	<5	<5	n/a
Chromium	(ug/L)	<25 UJ	<25 UJ	<25 UJ	<25 UJ	<10
Chromium (Dissolved)	(ug/L)	<25	<25	<25	<25	n/a
Lead	(ug/L)	5.2	9	4.8	12.3	<3
Lead (Dissolved)	(ug/L)	<3	4	5	<3	n/a
Mercury	(ug/L)	<0.2 UJ	<0.2 UJ	<0.2 UJ	<0.2 UJ	<0.2
Mercury (Dissolved)	(ug/L)	<0.2 UJ	<0.2 UJ	<0.2 UJ	<0.2 UJ	n/a
Selenium	(ug/L)	<5	<5	<5	<5	<5
Selenium (Dissolved)	(ug/L)	<5	<5	<5	<5	n/a
Silver	(ug/L)	<25 UJ	<25 UJ	<25 UJ	<25 UJ	<10
Silver (Dissolved)	(ug/L)	<25	<25	<25	<25	n/a
<b>Total Dissolved Solids</b>	(mg/l)	230	390	280	592	n/a
PH		7.18	7.3	7.64	7.64	n/a
Specific conductance	(uS/cm)	340	384	513	505	n/a
Temperature	(°C)	23.9	25.1	24	24.7	n/a

Values represent total concentrations unless noted

&lt; = Not detected at indicated reporting limit

n/a = Not analyzed

**Table 2-8.**  
**Groundwater Analytical Data Main Post Former Landfill #3.**  
*(Detected Analytes Only)*

Analyte (Units) – (EPA Method Note)	SAMPLE ID/LAB ID				
	MW4/ WSMR*9	MW-5/ WSMR*10	QC Split 1/ WSMR*48	MW-7/ WSMR*11	MW8/ WSMR*12
Methylene Chloride (ug/L) - (1)	*6	*5	<1	<1	*5
Aluminum (ug/L) - (2)	86.9	<50	<50	2,760	709
Barium (ug/L) - (2)	67.8	79.0	84.2	58.8	81.5
Boron (ug/L) - (2)	<5	<5	22.2	7.1	<5
Calcium (mg/L) - (2)	28.2	30.4	30.6	44.8	38.8
Iron (ug/L) - (2)	50.8	<10	<10	2,080	461
Magnesium (mg/L) - (2)	5.6	5.6	5.82	6.8	6.9
Manganese (ug/L) - (2)	<5	<5	<5	33.5	8.9
Silicon (ug/L) - (2)	21,300	19,100	18,700	26,100	21,600
Sodium (mg/L) - (2)	19.6	23.1	20.8	30.5	24
Vanadium (ug/L) - (2)	<10	<10	<10	10.6	<10
Zinc (ug/L) - (2)	28.5	20	24.5	15	12.4
TDS (mg/L) - (3)	202	215	204	291	248
Chloride (mg/L) - (4)	10	N/A	N/A	N/A	N/A
Fluoride (mg/L) – (5)	0.56	N/A	N/A	N/A	N/A
Nitrogen NO <sub>2</sub> +NO <sub>3</sub> (mg/L as N) – (6)	100	N/A	N/A	N/A	N/A
Gross, Alpha (PCI/L) – (7)	2.7	N/A	N/A	N/A	N/A
Gross, Alpha (CT Error)(+/- PCI/l) – (7)	2.4	N/A	N/A	N/A	N/A
Gross, Beta (PCI/L) – (7)	3.3	N/A	N/A	N/A	N/A
Gross, Beta (CT Error)(+/- PCI/L) – (7)	1.3	N/A	N/A	N/A	N/A
Gross, Uranium (PCI/L) – (8)	0.6	N/A	N/A	N/A	N/A
Gross, Uranium (CT Error)(+/- PDI/L) – (8)	0.3	N/A	N/A	N/A	N/A

**NOTES:**

N/A - Not analyzed by this method

mg/L - milligrams per Liter

ug/L - micrograms per Liter

TDS - Total Dissolved Solids

QC SPLIT – Duplicate of well MW-5, performed by QC Lab

PCI/L - Pico Curies per Liter

\* - Probable lab contaminant

(1) – Analyses performed using EPA Method 8260 (Volatile Organics)

(2) - Analyses performed using EPA Method 6010 (Metals)

(3) - Analyses performed using EPA Method 160.1 (TDS)

(4) - Analyses performed using EPA Method 9252

(5) - Analyses performed using EPA Method 340.2

(6) - Analyses performed using EPA Method 353.2

(7) - Analyses performed using EPA Method 9310

(8) - Analyses performed using EPA Method 908.8

### 3.0 CONTINUED SITE INVESTIGATION

#### 3.1 Archeological Survey

A Class III cultural-resources inventory was conducted at MPLF#3 and an adjacent undisturbed block of land to the southeast during May 2000, by Human Systems Research, Inc. archaeologists. By Bureau of Land Management standards, a Class III Cultural Resources inventory is a 100% inventory survey conducted to identify and record artifact and historical areas of concern and includes literature research, a preliminary site review, and an intensive field reconnaissance of the site and surrounding area. The survey was conducted to meet the WSMR

National Environmental Policy Act (NEPA) requirements as well as Section 106 compliance responsibility under the National Historic Preservation Act of 1966. This inventory process involved consultation with cultural-resource archival sources to identify any previously recorded historic properties in the vicinity, surveying the site to locate any unrecorded cultural-resources, and assessing cultural-resources for eligibility to the National Register of Historic Places.

A pedestrian survey of the site resulted in the documentation of the landfill as a Cold War era site. Surface artifacts were inventoried and diagnostic historic/recent artifacts found on the surface were mapped. Fourteen Isolated Occurrences (IOs), some consisting of more than one artifact, were recorded during the survey. All but three of the IOs are listed as prehistoric lithic artifacts. No additional archaeological sites were encountered during the survey.

MPLF#3 contains evidence relevant to daily lifeways/social history of White Sands personnel; the history and events associated with the functions of the range; and the role of White Sands Missile Range in the local, regional, and national events associated with the Cold War and national defense efforts. This site is considered potentially eligible to the National Register for historic preservation; however, due to the extensive recordation of the site it has been determined that the research potential of the isolated prehistoric artifacts has been exhausted. Therefore, a determination of no adverse affect to cultural resources was made by HSR for MPLF# 3.

### **3.2 Groundwater Monitoring**

Groundwater at this site has been monitored since 1996 for a suite of analytes that includes VOCs, SVOCs, metals, explosive residues, cyanide, dissolved ions, fuel hydrocarbons, and a specific set of water quality parameters. Samples collected semi-annually are used to determine whether contaminants originating from the landfill leachate are migrating to groundwater.

Samples collected as part of the 1996 SWMU Groundwater Monitoring Program revealed trace amounts of two VOCs, toluene and trichlorofluoromethane (at concentrations of 1 microgram per liter ( $\mu\text{g/L}$ ) and 16  $\mu\text{g/L}$ , respectively), from the field blank prepared for MW-8 (MEVATEC, 1997). Trichloroflouromethane was also detected in the field blank prepared for MW-5 at a concentration of 3  $\mu\text{g/L}$ . The detection of these constituents was considered to be the result of contamination from the neoprene gloves worn by the field crew during preparation of the field blanks or from the plastic container in which the reagent water that was used for the blanks was stored. Results of the Fall 1996 Groundwater Sampling Event are provided in Table 3-1. No samples were collected during Spring 1997 at MPLF#3.

Consistent with the 1996 sampling event results, no VOCs, SVOCs, or explosive residue compounds were detected in any of the groundwater samples collected during the August 1997 sampling period. Detected constituents included various dissolved anions, cations, and metals. With the exception of Iron (1.8 mg/L, NMWQCC standard is 1.0 mg/L) in MW-4 and thallium (0.012 mg/L, NMED standard is 0.002 mg/L) in MW-8, all concentrations of detected analytes were below the applicable NMWQCC standards and NMED Drinking Water standards (see Table 3-2). Total dissolved solids (TDS) values in all wells reported below the NMWQCC standard of 1000 mg/L, ranging between 210 mg/L in MW05 and 280 mg/L in MW-7.

**Table 3-1. Fall 1996 Results of Groundwater Analysis SWMU 65 Former Main Post Landfill No. 3**  
(detected analytes only)

PARAMETER	METHOD	UNIT	MW04-GW1		MW05-GW1		MW05-GW1 QC		MW07-GW1		MW07-GW1 QA		MW08-GW1	
Total Petroleum Hydrocarbons	EPA 418.1	mg/L	0.10		<0.10		0.155		0.11		<0.10		0.17	
Aluminum	SW846-6010A	mg/L	<0.10		<0.10		<0.10		1.21	J	3.3	J	0.12	
Arsenic	SW846-6010A	mg/L	<0.005		0.0052		<0.005		<0.005		<0.0050		<0.005	
Barium	SW846-6010A	mg/L	0.067	J	0.084	J	0.085	J	0.064	J	0.07		0.099	J
Calcium	SW846-6010A	mg/L	28.6		32.1		32.8		47.4		45.6		42.9	
Iron	SW846-6010A	mg/L	0.27		0.43		0.13		1.47		1.9		0.11	
Lead	SW846-6010A	mg/L	0.011		<0.005		0.0063		0.0089		0.006		<0.005	
Magnesium	SW846-6010A	mg/L	5.8		6.1		6.4		7.6		7.0		7.8	
Manganese	SW846-6010A	mg/L	<0.01		<0.01		<0.01		0.045		0.109		<0.01	
Potassium	SW846-6010A	mg/L	<5.0		<5.0		<5.0		<5.0		1.7		<5.0	
Selenium	SW846-6010A	mg/L	<0.005		0.0058		0.0075		0.0071		<0.0050		0.0056	
Silicon	SW846-6010A	mg/L	21.0		20.1		21.0		23.1		23.7		20.8	
Sodium	SW846-6010A	mg/L	16.2		21.2		22.1		31.3		30.6		22.8	
Strontium	SW846-6010A	mg/L	0.16		0.21		0.20		0.25		0.3		0.21	
Vanadium	SW846-6010A	mg/L	<0.01		<0.01		<0.01		0.015		0.014		<0.01	
Zinc	SW846-6010A	mg/L	<0.02		0.024		<0.02		<0.02		<0.10		<0.02	
Bicarbonate Alkalinity as HCO <sub>3</sub>	EPA 310.1	mg/L	50		53		53		64		115	J	59	
Bromide	EPA 300.0	mg/L	0.09		0.08		0.07		0.11		<0.50		0.10	
Chloride	EPA 325.3	mg/L	12		12		14		21		19.0		20	
Fluoride	EPA 340.2	mg/L	0.53		0.81		0.81		0.38		<0.50		0.43	
Nitrate as N	EPA 352.1	mg/L	1.0		1.1		1.2		2.04		2.0		1.80	
PH in Water	EPA 150.1	mg/L	7.13		7.36		7.49		7.82		7.8		7.75	
Sulfate	EPA 375.4	mg/L	31		44		39		60		62		43	
Total Dissolved Solids	EPA 160.1	mg/L	230		220		300		300		258		280	

**Table 3-2. Fall 1997  
Groundwater Sampling Analytical Results – Main Post Landfill No. 3 at (Scrap Yard).  
(detected analytes only)**

PARAMETER	METHOD	UNIT	MW-4-GW2	MW-5-GW2	MW-5-GW2 QC	MW-5-GW2 QA	MW-7-GW2	MW-8-GW2	NMWQCC Standard				
<b>Total METALS</b>													
Arsenic	SW846-6010A	mg/L	0.007	0.006	0.006	0.0027	J	0.007	0.012	0.1			
Barium	SW846-6010A	mg/L	0.081	0.081	0.081	0.0809		0.063	0.093	1.0			
Boron	SW846-6010A	mg/L	<0.1	0.51	J	<0.1	UJ	<0.05	UJ	<0.1	0.75		
Cadmium	SW846-6010A	mg/L	<0.0005	<0.0005		<0.0005		0.0007	0.0017	0.01			
Calcium	SW846-6010A	mg/L	33	30	30	30.8		47	44	NE			
Chromium	SW846-6010A	mg/L	0.008	0.002	0.002	<0.010	UJ	0.004	0.01	0.05			
Cobalt	SW846-6010A	mg/L	<0.002	<0.002	<0.002	<0.020		<0.002	0.003	0.05			
Copper	SW846-6010A	mg/L	<0.02	0.02	J	<0.02	UJ	<0.005	UJ	<0.02	1.0		
Iron	SW846-6010A	mg/L	1.8	0.25	0.14	0.463		0.10	0.14	1.0			
Lithium	SW846-6010A	mg/L	<0.1	0.867	<0.1	<0.1		<0.1	<0.1	NE			
Magnesium	SW846-6010A	mg/L	0.004	<0.002	0.002	5.73		7.2	7.7	NE			
Manganese	SW846-6010A	mg/L	6.2	<5.7	5.8	<0.005		0.004	0.003	0.2			
Molybdenum	SW846-6010A	mg/L	0.004	0.203	J	<0.02	UJ	0.0113	J	<0.02	1.0		
Silicon	SW846-6010A	mg/L	<0.02	12.75	12.7	J	19.5	13.7	J	14.4	J	NE	
Sodium	SW846-6010A	mg/L	14.6	J	19	19	NA	27	18	18	NE		
Strontium	SW846-6010A	mg/L	16		0.327	J	0.329	J	0.219	J	0.483	J	NE
Thallium	SW846-6010A	mg/L	0.316	J	0.006	<0.005	<0.005	<0.005	0.012		0.002*		
Vanadium	SW846-6010A	mg/L	<0.005	0.008	0.007	<0.010		0.011	0.006	NE			
Zinc	SW846-6010A	mg/L	0.03	0.03	0.02	<0.030		<0.02	<0.02	10			
<b>Dissolved METALS</b>													
Calcium	SW846-6010A	mg/L	31	30	31	29.0		43	37	NA			
Magnesium	SW846-6010A	mg/L	5.7	5.6	5.7	5.34		6.3	6.3	NA			
Potassium	SW846-6010A	mg/L	<5	<5	<5	1.52		<5	<5	NA			
Sodium	SW846-6010A	mg/L	16	19	20	21.8		27	18	NA			
<b>Water Quality Parameters</b>													
Bicarbonate Alkalinity as HCO3	EPA 310.1	mg/L	51	39	51	92		56	49	NE			
Bromide	EPA 300.0	mg/L	<2.00	2.18	J	<2	UJ	<0.2	UJ	<2.00	NE		
Chloride	EPS 300.0	mg/L	13.5	12.74	13.31	10.9		21.8	18.7	250.0			
Conductance	EPS 120.1	uS/cm	1120	380	360	288		720	480	NA			
Fluoride	EPS 340.2	mg/L	0.545	0.891	0.813	0.74		0.387	0.452	1.6			
Nitrate	EPS 300.0	mg/L	1.29	1.36**	1.28	1.55		2.12	2.12	10.0*			
pH	EPA 150.1	N/A	7.17	7.17	7.16	7.43		7.01	7.5	6-9			
Sulfate	EPA 300.0	mg/L	42.9	52.1	50.4	38.4		78.5	56.5	600.0			
TOC	EPA 415.1	mg/L	<1.0	5.4	J	<1.0	UJ	1.5	J	<1.0	NE		
TDS	EPA 160.1	mg/L	217	220	210	252		280	216	1000.0			

N/A – Not Analyzed  
\* NMED Drinking Water Standard

N/A – Not Applicable  
\*\* Nitrate/Nitrite as N

NE – Not Established

VOCs and explosive compounds were not detected in the samples collected during the January 1998 sampling event (see Table 3-3). Among the remaining constituents, fluoride was the only one detected (in MW-4 and MW-5 Quality Control [QC]) above NMWQCC standards for this sampling event.

Samples collected during Fall 1998 and Spring 1999 also yielded consistent results (see Tables 3-4 and 3-5). No VOCs, SVOCs, or explosive compounds were detected in samples collected for either event. Reported pH, TDS, conductivity, and alkalinity were also consistent and did not exceed NMWQCC standards. No samples were collected during Fall 1999 at MPLF#3.

For the Spring 2000 and Fall 2000 sampling events, no concentrations of VOCs, fuel hydrocarbons, or explosive compounds were detected above applicable NMWQCC (see Tables 3-6 and 3-7). The groundwater analysis also revealed no metal concentrations exceeding the NMWQCC standards. General chemistry analysis indicated that pH, TDS, conductivity, alkalinity, chloride, fluoride, sulfate, bromide, nitrate, and total organic carbon (TOC) did not exceed the NMWQCC standards.

#### **4.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

No concentrations of VOCs, fuel hydrocarbons or explosives have been detected above reporting limits in soil samples collected at this site. Analyses of groundwater samples have revealed no VOCs, other than those attributable to field contamination in the 1996 groundwater sampling event, or metal concentrations that exceed the NMWQCC standards. In addition, general chemistry analyses have revealed no concentrations of pH, total dissolved solids, conductivity, total alkalinity, bicarbonate alkalinity, carbonate alkalinity, chloride, fluoride, sulfate, bromide, nitrate, or total organic carbon exceeding the NMWQCC standards.

Comparison of analytical results, of groundwater samples collected from the upgradient (MW-04 and MW-08) and downgradient (MW-05 and MW-07) monitoring wells at MPLF#3 since 1992 (see Tables 2-1 thru 2-8 and 3-1 thru 3-7), reveal that the 35 year presence of the landfill has not impacted the groundwater. White Sands Missile Range will use this determination in conjunction with the Phase I and II RFIs to support a petition for no further action with the State. A Class III permit modification will be submitted to the New Mexico Hazardous Waste Bureau requesting that the site be removed from the RCRA Part B Permit Corrective Action Module VIII.

**Table 3-3. January, Spring 1998 (2<sup>nd</sup> Quarter)**  
**Groundwater Sampling Analytical Results – Main Post Landfill No. 3 at (Scrap Yard).**  
*(detected analytes only)*

PARAMETER	METHOD	UNIT	MW-4-GW3	MW-5-GW3	MW-5-GW3 QC	MW-5-GW3 QA	MW-7-GW3	MW-8-GW3	NMWQCC Standard
<b>Total METALS</b>									
Arsenic	SW846-6010A	mg/L	0.035	0.009	0.011	<0.0025	0.064	0.062	0.1
Barium	SW846-6010A	mg/L	0.079	0.092	0.105	0.0834	0.062	0.091	1.0
Cadmium	SW846-6010A	mg/L	0.0012	0.0014	<0.0005	<0.0050	0.0010	0.0009	0.01
Calcium	SW846-6010A	mg/L	29	34	42	30.8	43	40	NE
Chromium	SW846-6010A	mg/L	0.004	0.002	0.002	<0.0100	0.004	0.002	0.05
Cobalt	SW846-6010A	mg/L	0.002	0.002	<0.002	<0.0200	0.002	<0.002	0.05
Iron	SW846-6010A	mg/L	0.15	<0.1	<0.1	<0.0450	<0.1	<0.1	1.0
Lead	SW846-6010A	mg/L	<0.003	<0.003	0.021	0.0046	<0.003	<0.003	0.05
Magnesium	SW846-6010A	mg/L	6.2	7.1	9.6	5.7	6.4	7.1	NE
Manganese	SW846-6010A	mg/L	0.002	<0.002	<0.002	<0.0050	0.004	0.003	0.2
Nickel	SW846-6010A	mg/L	<0.01	<0.01	0.02	<0.0150	<0.01	<0.01	0.2
Silicon	SW846-6010B	mg/L	21	19	19	19,500	20	20	NE
Sodium	SW846-6010A	mg/L	16	23	41	NA	26	19	NE
Strontium	SW846-6010B	mg/L	0.22	0.248	0.24	0.232	0.34	0.26	NE
Vanadium	SW846-6010A	mg/L	0.005	0.008	0.011	<0.0100	0.011	0.006	NE
Zinc	SW846-6010A	mg/L	0.03	0.02	0.04	<0.0300	0.02	0.02	10
<b>Dissolved METALS</b>									
Calcium	SW846-6010A	mg/L	30	41	31	31.8	45	39	NA
Magnesium	SW846-6010A	mg/L	6.7	9.1	5.9	5.95	6.7	7.2	NA
Potassium	SW846-6010A	mg/L	<5	<5	<5	1.53	<5	<5	NA
Sodium	SW846-6010A	mg/L	18	38	20	24.3	27	19	NA
<b>Water Quality Parameters</b>									
Bicarbonate Alkalinity as HCO <sub>3</sub>	EPA 310.1	mg/L	41.5	48.8	43.9	86.0	58.6	53.7	NE
Chloride	EPA 300.0	mg/L	9.64	9.50	8.14	11.6	18.97	14.93	250.0
Conductance	EPA 120.1	uS/cm	440	260	250	308	330	290	NA
Fluoride	EPA 340.2	mg/L	1.65	1.42	1.60	0.829	1.07	1.28	1.6
Nitrate/Nitrite as N	EPA 300.0	mg/L	1.17	1.09	1.10	1.44	1.56	1.54	10.0*
pH	EPA 150.1	N/A	7.22	7.31	7.32	7.60	7.70	7.61	6-9
Sulfate	EPA 300.0	mg/L	34.47	38.18	28.59	39.8	65.22	65.95	600.0
Total Dissolved Solids	EPA 160.1	mg/L	196	208	210	217	282	243	1000.0
<b>Total Petroleum Hydrocarbons</b>	EPA 418.1	mg/L	0.35	0.41	0.41	<0.17	0.58	0.33	NE
<b>Semi-Volatile Organic Compounds</b>									
Bis (2-ethylhexyl) phthalate	SW846-8270	ug/L	<10	<10	<10	2.3	<10	<10	NE

N/A – Not Analyzed

N/A – Not Applicable

NE – Not Established

\* NMWQCC Standard for Nitrate as Nitrogen

**Table 3-4. Analytical Results of the Fall 1998 Sampling Event, Former Main Post Landfill No. 3.**  
(detected analytes only)

ANALYTES	METHOD	NMWQCC Standard	UNITS	MW-04	MW-05	MW-05 QC	MW-05 QA	MW-07	MW-08				
<b>Total METALS</b>	SW846												
Aluminum	6010B	5.0	mg/L	0.006	<0.005		<0.005	<0.1	<0.005	0.25			
Barium	6010B	1.0	mg/L	0.081	0.097		0.088	0.0824	0.081	0.085			
Beryllium	6010B	--	mg/L	0.002	0.002		0.002	<0.002	0.002	0.002			
Chromium	6010B	0.05	mg/L	0.006	<0.005		<0.005	<0.005	0.006	0.01			
Iron	6010B	1.0	mg/L	1.7	0.90	J	0.35	J	0.364	1.7	0.50		
Lead	6010B	0.05	mg/L	0.002	<0.002		<0.002	<0.003	0.002	0.01			
Mercury	7470A	0.002	mg/L	<0.0002	0.00021		<0.0002	<0.0002	<0.0002	0.00036			
Nickel	6010B	0.2	mg/L	0.01	0.01		<0.01	<0.01	0.01	<0.01			
Silicon	6010B	--	mg/L	18	15		15	13	18	17			
Silver	6010B	0.05	mg/L	0.006	<0.005		<0.005	<0.005	<0.005	<0.005			
Strontium	6010B	--	mg/L	0.23	0.24		0.24	0.215	0.23	0.26			
Thallium	6010B	--	mg/L	0.002	<0.002		0.003	<0.002	0.002	<0.002			
Vanadium	6010B	--	mg/L	0.011	0.019	J	0.017	J	0.0078	0.011	<0.005		
<b>Dissolved METALS</b>													
Potassium	200.7		mg/L	3.6	3.6	J	3.5	J	1.34	J	3.8	1.9	
Magnesium	200.7		mg/L	6.6	5.8		6.1		5.74		6.8	7.0	
Calcium	200.7		mg/L	32	32		31		31		46	40	
Sodium	200.7		mg/L	21	24		24		22.9		30	22	
<b>PHYS. CHAR.</b>	STD METH												
PH	4500	>6,<9	Std.	7.1	7.4		7.8		7.5		7.8	7.5	
Total Dissolved Solids	2540	<10,000	mg/L	220	240		220		214		300	250	
Conductance	2510B		µS/cm	290	300		320		297		410	340	
<b>ALKALINITY</b>													
Total	2320B		mg/L	88	99		99		92		120	100	
Bicarbonate	2320B		mg/L	88	99		99		--		120	100	
<b>DISSOLVED IONS</b>													
Chloride	300.0	250	mg/L	7.1	7.8		8.2		11.7		17	52	J
Fluoride	340.2	1.6	mg/L	1.4	1.8		1.8		0.8		1.4	1.2	J
Sulfate	300.0	600	mg/L	37	38		37		41.8		56	54	J
Bromide	300.0	--	mg/L	<2.5*	<2.5*		<2.5*		<0.2		<2.5*	<1.0	UJ
Nitrate	352.1	10	mg/L	1.5	1.3		<1.0		1.05		2.1	2.0	
<b>TTL ORGANIC CARBON</b>													
TTL Petrl H H'Carbons	8015 DRO		mg/L	<5.0	<5.0		<5.0		<0.5		<5.0	UJ	<5.0
			mg/L	<2.0	<2.0	UJ	<2.0	UJ	16	J	<2.0		<2.0

**Table 3-5. Analytical Results of the Spring 1999 Sampling Event, Former Main Post Landfill No. 3.  
(detected analytes only)**

ANALYTES	METHOD	NMWQCC Standard	UNITS	MW-04	MW-05	MW-05 QC	MW-05 QA	MW-07	MW-08
<b>Total METALS</b>									
Barium	6010B	1.0	mg/L	0.058	0.09	0.12	0.088	0.038	0.09
Iron	6010B	1.0	mg/L	0.23	0.16	J 0.41	J 0.13	<0.10	<0.10
Molybdenum		1.0	mg/L	<0.10	<0.10	<0.10	0.012	<0.10	<0.10
Silicon	6010B	n.e.	mg/L	22.0	19.0	J 23.0	8.2	J 22.0	23.0
Strontium	6010B	n.e.	mg/L	<0.10	0.26	0.31	0.22	<0.10	0.29
Vanadium	6010B	n.e.	mg/L	<0.005	<0.005	0.008	0.0081	<0.005	<0.005
<b>Dissolved METALS</b>									
Potassium	200.7	n.e.	mg/L	2.2	1.8	2.1	1.5	<10.0	2.1
Magnesium	200.7	n.e.	mg/L	6.4	6.5	7.6	5.9	7.1	8.2
Calcium	200.7	n.e.	mg/L	33.0	37.0	44.0	30.0	54.0	48.0
Sodium	200.7	n.e.	mg/L	17.0	24.0	28.0	24.0	J 30.0	24.0
<b>PHYS. CHAR.</b>									
<b>PH</b>	4500	>6, <9	Std.	7.1	7.3	7.3	7.5	7.8	7.6
<b>Total Dissolved Solids</b>	2540	<10,000	mg/L	230	200	200	220	300	250
<b>Conductance</b>	2510B	n.e.	µS/cm	280	300	300	300	410	350
<b>ALKALINITY</b>									
Total	2320B	n.e.	mg/L	88	110	92	86	110	100
<b>Bicarbonate</b>	2320B	n.e.	mg/L	88	110	92	86	110	100
<b>DISSOLVED IONS</b>									
Chloride	300.0	250	mg/L	12	12	12	13	21	18
Fluoride	340.2	1.6	mg/L	<0.5	<0.5	<0.5	0.84*	2x <0.5	<0.5
Sulfate	300.0	600	mg/L	36	39	35	44*	5x 64	44
Nitrate	352.1	10	mg/L	1.2	1.2	1.2	1.1	1.8	1.9

n.e - no standard established

\* Samples were diluted prior to analysis

**Table 3-6. Analytical Results of the Spring 2000 Sampling Event, Former Main Post Landfill No. 3.  
(detected analytes only)**

ANALYTES	METHOD	NMWQCC Standard	UNITS	MW-04		MW-05		MW-05 QC		MW-05 QA		MW-07		MW-08	
<b>METALS</b>	<b>SW846</b>														
Barium	6010B	1.0	mg/L	0.073	0.082		0.085		0.082		0.053		0.084		
Boron	6010B	0.75	mg/L	0.035	0.037		0.033		0.037		0.036		0.021		
Calcium	6010B	NE	mg/L	29	30		31		30.4		46		39		
Iron	6010B	1.0	mg/L	0.092	<0.050		<0.050		<0.050		0.058		<0.050		
Magnesium	6010B	NE	mg/L	6.4	6.0		6.2		5.64		6.9		7.2		
Molybdenum	6010B	1.0	mg/L	<0.010	0.012		0.011		0.012		<0.010		<0.010		
Potassium	7470A	NE	mg/L	1.5	1.5		1.5		1.5		1.8		1.7		
Sodium	6010B	20*	mg/L	20	23		24		22		33		23		
Strontium	6010B	17*	mg/L	0.21	0.22		0.23		0.22		0.3		0.24		
Vanadium	6010B	0.02*	mg/L	<0.010	<0.010		<0.010		<0.010		0.012		<0.010		
<b>SVOCs</b>	<b>SW846</b>														
Bis(2-ethylhexyl)phthalate	8270	NE	µg/l	<1.0	4.5	JB	4.1	JB	4.5	JB	3.4	JB	3.5	JB	
<b>PHYS. CHAR.</b>	<b>STD METH</b>														
PH	150.1	>6,<9	Std.	7.3	7.7		7.6		7.2		7.3		8		
Total Dissolved Solids	160.1	<10,000	mg/L	210	220		220		261		290		250		
Conductivity	120.1	NE	µS/cm	330	300		300		NA		420		320		
<b>ALKALINITY</b>															
Total	2320B	NE	mg/L	82	89		89		87		110		94		
Bicarbonate	2320B	NE	mg/L	82	89		89		89.6		110		94		
<b>DISSOLVED IONS</b>															
Chloride	300.0	250	mg/L	14	14		12		23.4		--		19		
Fluoride	340.2	1.6	mg/L	0.57	0.84		0.85		0.82		--		0.5		
Sulfate	300.0	600	mg/L	43	45		43		81.7		70		49		
Nitrate	353.3	10	mg/L	1.4	1.2		1.3		0.13		--		2		
<b>TTL ORGANIC CARBON</b>	<b>9060</b>	<b>NE</b>	<b>mg/L</b>	<b>0.77</b>	<b>2.6</b>		<b>7.2</b>		<b>2.6</b>		<b>3.3</b>		<b>7.3</b>		

Notes:

J = Estimated

B = Analyte found in the associated blank as well as the sample

NE = No NMWQCC standard is established

NA = Not analyzed

µS/cm = microsiemens per centimeter

\* = EPA Health Advisory standard used for lack of NMWQCC standard

µg/L = micrograms per liter

mg/L = milligrams per liter

Std. = Standard unit of measureme

**Table 3-7.**  
**Analytical Results of the Fall 2000 Sampling Event, Former Main Post Landfill No. 3.**  
*(detected analytes only)*

ANALYTES	METHOD	NMWQCC Standard	UNITS	MW-04	MW-05	MW-05 QC	MW-05 QA	MW-07	MW-08					
<b>METALS</b>	SW846													
Barium	6010B	1.0	mg/L	<0.05	<0.05	<0.05	0.0837	B	<0.05	0.06				
Calcium	6010B	NE	mg/L	30	31	33	29.6		47	38				
Iron	6010B	1.0	mg/L	<0.5	<0.50	<0.5	1.8		<0.5	<0.5				
Magnesium	6010B	NE	mg/L	6.9	5.9	6.6	5.28		6.4	6.6				
Potassium	7470A	NE	mg/L	3.7	3.8	4.7	1.84	B	4.6	2.0				
Sodium	6010B	20*	mg/L	22	25	25	22.2		36	20				
Strontium	6010B	17*	mg/L	0.19	0.22	0.21	-		0.27	0.23				
<b>SVOCs</b>	SW846													
Bis(2-ethylhexyl)phthalate	8270	NE	mg/l	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005				
<b>PHYS. CHAR.</b>	STD METH													
PH	150.1	>6,<9	Std.	7.59	7.57	7.53	7.3		7.84	8.21				
Total Dissolved Solids	160.1	<10,000	mg/L	200	210	220	223		280	220				
Conductivity	120.1	NE	µS/cm	290	310	310	145		420	360				
<b>ALKALINITY</b>														
Total	310.1	NE	mg/L	74	B	85	B	91	B	89.7	102	B	96	B
Bicarbonate	310.1	NE	mg/L	74	B	85	B	91	B	89.5	102	B	96	B
<b>DISSOLVED IONS</b>														
Bromide	300.0		mg/L	<1.0		<1.0	<1.0		<0.5		<1.0		<1.0	
Chloride	300.0	250	mg/L	15		14	14		<20		21		19	
Fluoride	300.0	1.6	mg/L	<1.0		1.2	1.3		0.75		<1.0		<1.0	
Sulfate	300.0	600	mg/L	37		39	38		39.8		60		43	
Nitrate	4500	10	mg/L	0.81		0.98	0.8		12.2		1.1	J	2.7	
<b>TTL ORGANIC CARBON</b>	S 415.1	NE	mg/L	<1.0		<1.0	<1.0		2.6		<1.0		<1.0	

Notes:

B = Analyte found in the associated blank as well as the sample  
 NE = No NMWQCC standard is established  
 NA = Not analyzed  
 \* = EPA Health Advisory standard used for lack of NMWQCC standard

J = Estimated

mg/L = milligrams per liter  
 Std. = Standard unit of measurement  
 µS/cm = microsiemens per centimeter  
 µg/L = micrograms per liter

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