Voluntary Corrective Action Completion Report for

Potential Release Site 35-014(f)

Oil-Stained Soil and Concrete

Field Unit 4

Environmental Restoration Project

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ACRONYMS AND ABBREVIATIONS

CMP	corrugated metal pipe
cpm	counts per minute
EPA	Environmental Protection Agency
EQL	estimated quantitation limit
ER	Environmental Restoration
FIMAD	Facility for Information Management, Analysis, and Display
GC/ECD	gas chromatography/electron capture detector
GC/FID	gas chromatography/flame ionization detector
GC/MS	gas chromatography/mass spectrometry
GFAA	graphite furnace atomic absorption
H&S	health and safety
ICPES	inductively coupled plasma emission spectroscopy
ICPMS	inductively coupled plasma mass spectrometry
J	The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample.
J+	Reported value is an estimate and likely biased high.
J–	Reported value is an estimate and likely biased low.
LCS	laboratory control sample
MCE	multiple chemical evaluation
NA	not analyzed
N/A	not applicable
N.A.	not available
NAD	North American Datum
ND	not detected
NMSP	New Mexico State Plane
NR	not requested
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PRS	potential release site
Qbt3	cooling unit 3 of the Tshirege Member of the Bandelier Tuff
QC	quality control
R	The sample results are rejected because of serious deficiencies in the ability to analyze the sample and meet quality control criteria; presence or absence cannot be verified.
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RPD	relative percent difference

S	The sample results were obtained using a screening analytical method performed in a mobile laboratory facility.
SAL	screening action level
SAP	sampling and analysis plan
SMO	Sample Management Office
SVOC	semivolatile organic compound
TA	Technical Area
TIC	tentatively identified compound
TPH	total petroleum hydrocarbons
U	The analyte was analyzed for but not detected. Reported value is the sample quantitation limit or detection limit.
UJ	The analyte was analyzed for but not detected. Reported value is an estimate of the sample quantitation limit or detection limit.
UST	underground storage tank
UTL	upper tolerance limit
VCA	voluntary corrective action
VOC	volatile organic compound

1.0 INTRODUCTION

This report describes the voluntary corrective action (VCA) at Potential Release Site (PRS) No. 35-014(f), which is located within Los Alamos National Laboratory (the Laboratory) Technical Area (TA) -35 on Ten Site Mesa. The site was selected for VCA because the remedy was obvious, was easily implemented, and will prevent potential future migration and adverse environmental impacts associated with oil-stained soil and concrete areas.

This PRS is not included in Table A of Module VIII in the Laboratory's Hazardous Waste Facility Permit (EPA 1990, 1585). A Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) was performed for this PRS in 1995 and 1996. The PRS was recommended for VCA in the RFI report for TA-35 that was submitted in May 1996 (hereafter referred to as the RFI report) (LANL 1996, 54402). The VCA plan for PRS No. 35-014(f) (hereafter referred to as the VCA plan) (LANL 1996, 53783) identifies and describes two relatively small areas of oil-stained soil and concrete that could easily be remediated by a VCA. The two oil-stained soil areas are located about 15 ft apart, as shown on Figure 1-1. The site drains to the east about 20 ft into two storm water collection drains that flow into an 18-in.-diameter corrugated metal pipe (CMP). The CMP discharges to the north edge of Ten Site Mesa (north of the Chemical Laser Facility [TA-35-85]) into Mortandad Canyon.

Figure 1-1 shows the location of the PRS. The site and its history are described in greater detail in the *RFI Work Plan for Operable Unit 1129* (hereafter referred to as the work plan), the June 1994 addendum to the work plan, and the VCA plan (LANL 1992, 7666; Pratt 1994, 43475; LANL 1996, 53783).

The activities outlined in the VCA plan included the removal and disposal of soils and concrete that were contaminated with total petroleum hydrocarbons (TPH), verification sampling, and site restoration.

2.0 SITE CHARACTERIZATION PRIOR TO REMOVAL

2.1 Pre-Phase I UST Investigation

On May 11 and 12, 1993, sampling was performed at PRS No. 35-014(f) (LANL 1993, 15302). Samples were collected from the site of two underground storage tanks (USTs) (TA-35-188[1 & 2]) after they were removed in accordance with the New Mexico Environment Department registered storage tank program.

Twenty-six soil samples were collected from six boreholes at the former UST locations. Each borehole was drilled to a depth of 20 ft. Five samples were collected from each of two boreholes (Location ID Nos. 35-1100 and 35-1101), which were drilled into the former tank pits to determine the presence and depth of potential contamination. Four samples were collected at 5-ft intervals from each of four boreholes (Location ID Nos. 35-1102 through 35-1105), which were drilled to bound potential contamination. The samples were submitted to the mobile laboratory facility for TPH analysis. The analysis was accomplished using a calibrated fixed-wavelength infrared analyzer (the Buck Scientific Total Hydrocarbon Analyzer Model HC-404) and Environmental Protection Agency (EPA) Analytical Method 418.1 modified for soils. Figure 1-1 shows the UST sample locations. Table 2.1-1 summarizes all UST sampling and the TPH results at PRS No. 35-014(f).

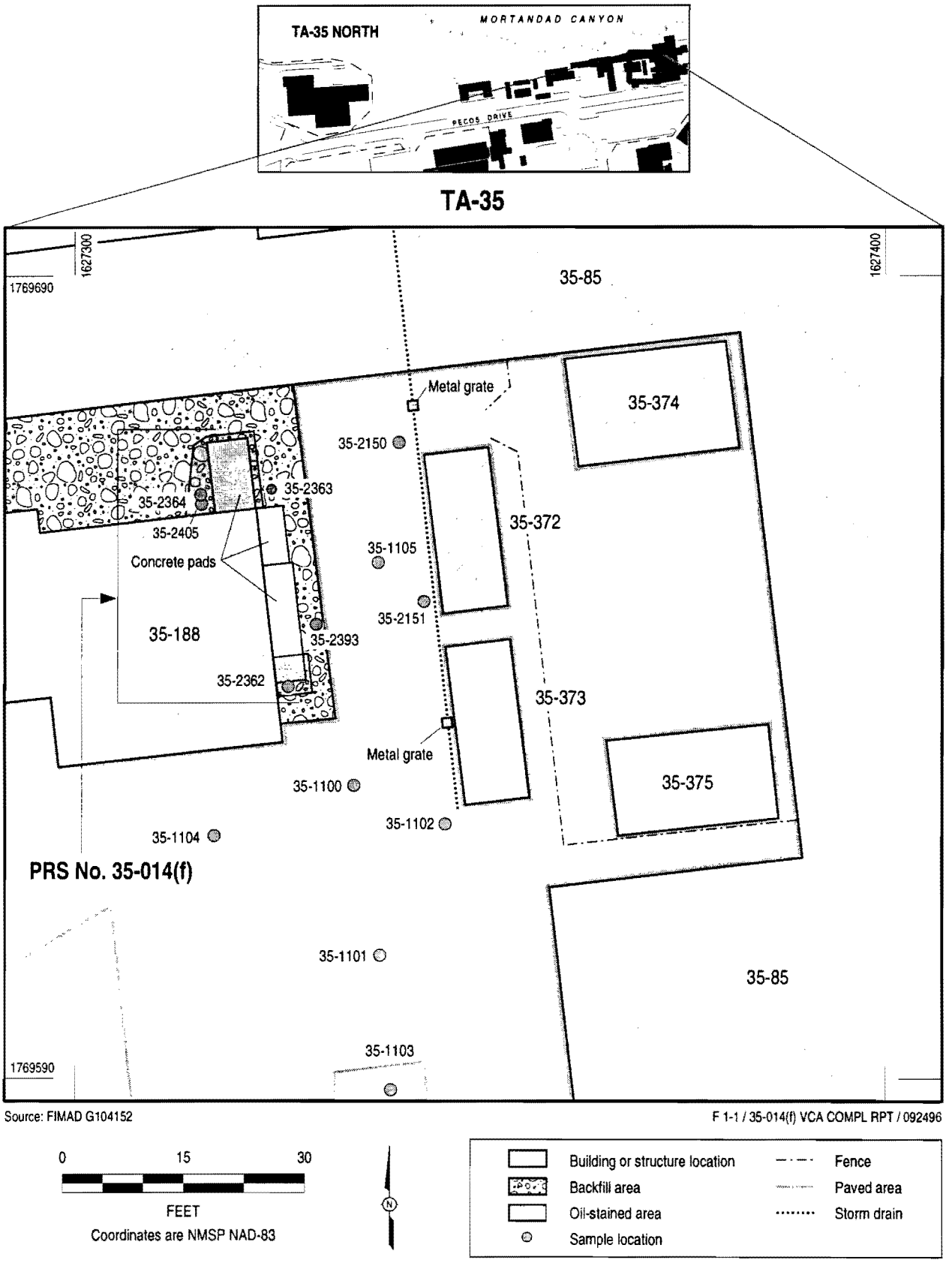


Figure 1-1. Site map of PRS No. 35-014(f) showing sample locations.

TABLE 2.1-1

SUMMARY OF UST SAMPLES TAKEN AND TPH RESULTS AT PRS No. 35-014(f)

Location ID	Sample ID	Depth (ft)	Media	TPH Result (mg/kg)
35-1100	AAA2387	6	Soil	81
35-1100	AAA2388	10	Soil	3
35-1100	AAA2389	11.5	Soil	500
35-1100	AAA2390	15	Soil	66
35-1100	AAA2417	20	Soil	14
35-1101	AAA2391	7.5	Soil	19
35-1101	AAA2392	10	Soil	23
35-1101	AAA2393	12	Soil	14
35-1101	AAA2394	15	Soil	ND
35-1101	AAA2422	20	Soil	ND
35-1102	AAA2396	5	Soil	2
35-1102	AAA2397	10	Soil	ND
35-1102	AAA2398	15	Soil	5
35-1102	AAA2399	20	Soil	ND
35-1103	AAA2400	5	Soil	4
35-1103	AAA2401	10	Soil	3
35-1103	AAA2402	15	Soil	9
35-1103	AAA2403	20	Soil	14
35-1104	AAA2405	5	Soil	6
35-1104	AAA2406	10	Soil	3
35-1104	AAA2407	15	Soil	7
35-1104	AAA2408	20	Soil	3
35-1105	AAA2409	5	Soil	ND
35-1105	AAA2410	10	Soil	ND
35-1105	AAA2411	15	Soil	7
35-1105	AAA2412	20	Soil	9

2.2 Field Activities

The Phase I RFI was performed in 1995 according to the sampling and analysis plan (SAP), which is described in Section 7.25 of the June 1994 addendum to the work plan (Pratt 1994, 43475). Supplemental sampling was performed in June 1996 according to a memorandum to the Field Unit 4 file dated June 3, 1996 (Pratt 1996, 54434). The objective of the RFI and the supplemental sampling was to characterize the nature of potential contamination associated with the oil-stained areas.

The conceptual model for this PRS (LANL 1992, 7666; Pratt 1994, 43475) took into account the known oil leaks at PRS No. 35-014(f). The oil was expected to infiltrate surface soils and be mobilized by surface and near-surface runoff to adjacent soil materials downgradient from the site.

A judgmental sampling approach based on the conceptual model was used, and the sampling activities were biased toward areas where residual contaminated was expected.

Field activities included a health and safety (H&S) radiation survey, engineering surveys, environmental surveys, three sampling events, and sample analysis.

Field screening during site surveys and sample collection activities was performed using a Foxboro 128GC organic vapor analyzer, a Ludlum Model 139 alpha meter, and an Eberline ESP-1 beta/gamma meter. Using this instrumentation, background radiation measurements at TA-35 range from 200 to 500 counts per minute (cpm) beta/gamma radiation depending on the location and substrate rock type. Field screening measurements greater than 500 cpm beta/gamma radiation were generally considered to be above background levels. No beta/gamma radiation measurements above background levels were obtained during field screening at this site, and no alpha radiation or anomalous organic vapors were detected.

2.2.1 Environmental and Engineering Surveys

The H&S radiation surveys were performed on September 8, 1994, and May 8, 1996. No beta/gamma radiation measurements above background levels were detected.

Engineering surveys were performed on September 8, 1994, March 24, 1995, and May 8, 1996. The surveys consisted primarily of identifying and documenting the location and condition of the PRS and proposed sample locations before beginning sampling activities. On June 3, 1996, an engineering survey was performed to select supplemental sample locations.

2.2.2 Deviations from the RFI Sampling and Analysis Plan

The Phase I sampling activities followed the original SAP, which is described in the June 1994 addendum to the work plan (Pratt 1994, 43475) . Because the initial sample locations were not located at the immediate area of the oil stains, supplemental RFI samples were planned to collect oil-stained soil. The supplemental sampling activities provided for the drilling of four additional hand-auger holes and the collection of samples from the 0 to 1-ft and 2- to 3-ft intervals. The supplemental samples were sent to a fixed-site laboratory for the following analyses: volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), TPH, and metals. The supplemental sampling activities were documented in a memorandum to the Field Unit 4 file (Pratt 1996, 54434).

On August 19, 1996, three of the eight locations were resampled, and the samples were submitted to the mobile radiological van for tritium screening. The tritium data were needed for waste characterization purposes. The waste characterization sampling activity was documented in a Daily Activity Log.

2.2.3 Sampling Activities

Phase I sampling was performed on March 29, 1995. Six soil samples were collected in two hand-auger holes (Location ID Nos. 35-2150 and 35-2151) from the following intervals: 0 to 1 ft, 1 to 2 ft, and 2 to 3 ft. These samples were analyzed for gross-alpha, -beta, and -gamma radiation in the mobile radiological van and for VOCs, polycyclic aromatic hydrocarbons (PAHs), and PCBs in the mobile laboratory facility using modified EPA SW-846 methods for the organic chemicals (EPA 1986, 31733). Figure 1-1 shows the locations of all RFI samples discussed in Section 2.2.3.

Supplemental samples were collected on June 7, 1996. A total of eight soil samples were collected from four hand-auger holes. At each of three hand-auger holes, two samples were collected from the following intervals: 0 to 1 ft and 2 to 3 ft. At one hand-auger hole, the deeper sample was collected from the 2- to 2.8-ft interval when the hand auger was unable to advance beyond that depth because of an unknown

obstruction. The supplemental sample locations included Location ID Nos. 35-2362 through 35-2364 and 35-2393. These samples were analyzed for gross-alpha, -beta, and -gamma radiation in the mobile radiological van and for VOCs, SVOCs, PCBs, TPH, and metals in a fixed-site laboratory using EPA SW-846 methods for the organic chemicals (EPA 1986, 31733) and EPA SW-846 Method 6010 and Method 6020 with inductively coupled plasma spectrometry for metals analysis.

One confirmatory sample was collected on July 25, 1996. The sample was collected from the 0 to 0.5-ft. interval at Location ID No. 35-2405, which is adjacent to supplemental sample Location ID No. 35-2364. This sample was collected to provide confirmatory TPH data near Location ID No. 35-2364, and was analyzed for gross-alpha, -beta, and -gamma radiation in the mobile radiological van and for TPH in a fixed-site laboratory using EPA SW-846 methods for the organic chemicals (EPA 1986, 31733).

Additional samples were collected for waste characterization purposes on August 19, 1996. A total of three soil samples were collected from two different locations. The following locations and intervals were resampled: Location ID No. 35-2363 (0 to 1 ft) and Location ID No. 35-2393 (0 to 1 ft and 2 to 3 ft). The samples were analyzed for tritium in the mobile radiological van. No tritium was detected.

Table 2.2-1 summarizes all RFI sampling for PRS No. 35-014(f).

TABLE 2.2-1

SUMMARY OF RFI SAMPLES TAKEN AT PRS No. 35-014(f)[a]

Location ID	Sample ID	Depth (ft)	Media	VOC Mobile Lab	VOC Fixed Lab	PAH Mobile Lab	SVOC Fixed Lab	PCB Mobile Lab	PCB Fixed Lab	TPH Fixed Lab	Inorganics Fixed Lab	RAD Mobile Lab
35-2150	AAC1201	0–1	Soil	21730	NR	21730	NR	21730	NR	NR	NR	21729
35-2150	AAC1202	1–2	Soil	21730	NR	21730	NR	21730	NR	NR	NR	21729
35-2150	AAC1203	2–3	Soil	21730	NR	21730	NR	21730	NR	NR	NR	21729
35-2151	AAC1204	0–1	Soil	21730	NR	21730	NR	21730	NR	NR	NR	21729
35-2151	AAC1205	1–2	Soil	21730	NR	21730	NR	21730	NR	NR	NR	21729
35-2151	AAC1206	2–3	Qbt3	21730	NR	21730	NR	21730	NR	NR	NR	21729
35-2362	0435-96-0072	0–1	Soil	NR	2236	NR	2236	NR	2236	2236	2237	N.A.[b]
35-2362	0435-96-0073	2–2.8	Soil	NR	2236	NR	2236	NR	2236	2236	2237	N.A.[b]
35-2363	0435-96-0075	0–1	Soil	NR	2236	NR	2236	NR	2236	2236	2237	N.A.[b]
35-2363	0435-96-0076	2–3	Soil	NR	2236	NR	2236	NR	2236	2236	2237	N.A.[b]
35-2363[c]	0435-96-0140	0–1	Soil	NR	NR	NR	NR	NR	NR	NR	NR	1
35-2364	0435-96-0077	0–1	Soil	NR	2236	NR	2236	NR	2236	2236	2237	N.A.[b]
35-2364	0435-96-0078	2–3	Soil	NR	2236	NR	2236	NR	2236	2236	2237	N.A.[b]
35-2393	0435-96-0079	0–1	Soil	NR	2236	NR	2236	NR	2236	2236	2237	N.A.[b]
35-2393	0435-96-0081	2–3	Soil	NR	2236	NR	2236	NR	2236	2236	2237	N.A.[b]
35-2393[c]	0435-96-0141	0–1	Soil	NR	NR	NR	NR	NR	NR	NR	NR	1
35-2393[c]	0435-96-0142	2–3	Soil	NR	NR	NR	NR	NR	NR	NR	NR	1
35-2405	0435-96-0096	0–0.5	Soil	NR	NR	NR	NR	NR	NR	2452	NR	N.A.[b]

a. The numbers in the analytical suite columns are analytical request numbers.
b. Analyses were performed, but analytical request numbers were not assigned.
c. Samples collected for waste characterization purposes only

2.3 Evaluation of Inorganic Chemicals

Background comparisons were performed for inorganic chemicals for which upper tolerance limit (UTL) values are available. Eight soil samples from four locations were analyzed in a fixed-site laboratory for an inorganic chemical analyte suite that included aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc using the EPA SW-846 methods discussed in Appendix A of this VCA report.

The highest detected value for each analyte was used for the background comparison. The all-soil horizon data UTL values (referred to as the all-soils UTL) were used for background comparison of soil samples analyzed by EPA SW-846 methods because discrete soil horizons were not identified during sampling activities. In Table 2.3-1, the values in the boxes indicate inorganic chemicals that were detected in soil at concentrations greater than or equal to their respective UTL values. Table 2.3-1 also shows detected inorganic chemicals for which there are no UTL values for comparison.

TABLE 2.3-1

INORGANIC CHEMICALS WITH CONCENTRATIONS*
GREATER THAN BACKGROUND UTL FOR PRS No. 35-014(f)

Location ID	Sample ID	Depth (ft)	Media	Ag	Ca	Cr	Cu	Ni	Sb
SAL	N/A	N/A	N/A	383	N.A.	210	2800	1500	31
All-soils UTL	N/A	N/A	N/A	N.A.	6120	19.3	15.5	15.2	1
35-2362	0435-96-0072	0–1	Soil	<1.5 U	2710	17.5 J-	26.3	20.5 J	<6.1 U
35-2362	0435-96-0073	2–2.8	Soil	<1.6 U	2710	16.8 J-	9.3	11.7	<6.8 U
35-2363	0435-96-0075	0–1	Soil	2 J	3000	53.7 J-	19.2	29.3 J	<5.9 U
35-2363	0435-96-0076	2–3	Soil	<1.5 U	1860	18.6 J-	6.2	11.9 J	7.2 J
35-2364	0435-96-0077	0–1	Soil	<1.5 U	2260	26.7 J-	9.1	16.4 J	<6.1 U
35-2364	0435-96-0078	2–3	Soil	<1.3 U	2410	90 J-	6.9	46.5 J	<5.5 U
35-2393	0435-96-0079	0–1	Soil	<1.4 U	8500	15.2 J-	7.2	8.8	6.1 J
35-2393	0435-96-0081	2–3	Soil	<1.4 U	3540	43.7 J-	3.2 J	22 J	<5.7 U

*mg/kg

Detected inorganic chemicals with one or more measured soil concentrations equal to or exceeding UTL values are summarized below.

- Antimony was detected in two samples at two different locations at a maximum concentration of 7.2 (J) mg/kg, which is above the all-soils UTL of 1 mg/kg.
- Calcium was detected in one sample at a concentration of 8,500 mg/kg, which is above the all-soils UTL of 6,120 mg/kg.
- Chromium was detected in four samples at three different locations at a maximum concentration of 90 (J) mg/kg, which is above the all-soils UTL of 19.3 mg/kg.

- Copper was detected in two samples at two different locations at a maximum concentration of 26.3 mg/kg, which is above the all-soils UTL of 15.5 mg/kg.

- Nickel was detected in five samples at four different locations at a maximum concentration of 46.5 (J) mg/kg, which is above the all-soils UTL of 15.2 mg/kg.

The following inorganic chemical was detected, but a UTL value is unavailable.

- Silver was detected in one sample at a concentration of 2 (J) mg/kg; there are no UTL values for silver.

2.4 Evaluation of Radionuclides

Radionuclides were evaluated for Department of Transportation screening purposes only.

2.5 Evaluation of Organic Chemicals

The organic chemicals analyzed for at this PRS include VOCs, SVOCs, PAHs, PCBs, and TPH. Six soil samples from two locations were analyzed for VOCs, PAHs, and PCBs in the mobile laboratory facility. Eight soil samples from four other locations were analyzed for VOCs, SVOCs, PCBs, and TPH in a fixed-site laboratory. One additional confirmatory TPH sample was collected at Location ID No. 35-2405.

As discussed in Appendix A of this VCA report, the presence of SVOCs was screened in the mobile laboratory facility by analyzing PAH compounds. Any extractable organic compounds present in the sample but not identified as target analytes (that is, PAHs) were quantitated to an estimated quantitation limit (EQL) of 5 mg/kg using the response factor for naphthalene and reported as "Total Extractable Organic Compounds." The sample results for both PAHs and PCBs may have been biased low because of less effective extraction methods. VOC results also may have been biased low because of matrix effects associated with gross hydrocarbon contamination. However, no organic chemicals were detected in any sample analyzed at the mobile laboratory facility.

Organic chemicals detected in soil are shown in Table 2.5-1 and are summarized below.

- *cis*-1,2-Dichloroethene was detected in three fixed-site laboratory samples at a maximum concentration of 0.003(J) mg/kg.

- Tetrachloroethene was detected in one fixed-site laboratory sample at a concentration of 0.002(J) mg/kg.

- Toluene was detected in three fixed-site laboratory samples at a maximum concentration of 0.006 (J) mg/kg.

- Trichloroethene was detected in four fixed-site laboratory samples at a maximum concentration of 0.021(J) mg/kg.

- Xylenes were detected in one fixed-site laboratory sample at a concentration of 0.003(J) mg/kg.

TABLE 2.5-1

SOIL CONCENTRATIONS* FOR DETECTED ORGANIC CHEMICALS AT PRS No. 35-014(f)

Part 1

Location ID	Sample ID	Depth (ft)	Media	*cis*-1,2-Dichloroethene	Tetrachloroethene	TPH
SAL	N/A	N/A	N/A	59	7	N.A.
EQL	N/A	N/A	N/A	0.010	0.005	20
35-2362	0435-96-0072	0–1	Soil	0.003 J	<0.006 U	8600
35-2362	0435-96-0073	2–2.8	Soil	<0.006 U	<0.006 U	12000
35-2363	0435-96-0075	0–1	Soil	<0.005 U	<0.005 U	<22 U
35-2363	0435-96-0076	2–3	Soil	<0.006 U	<0.006 U	3.9 J
35-2364	0435-96-0077	0–1	Soil	0.003 J	<0.005 U	1580 J
35-2393	0435-96-0079	0–1	Soil	0.001 J	0.002 J	7000
35-2393	0435-96-0081	2–3	Soil	<0.006 U	<0.006 U	740
35-2405	0435-96-0096	0–0.5	Soil	NA	NA	85000 J

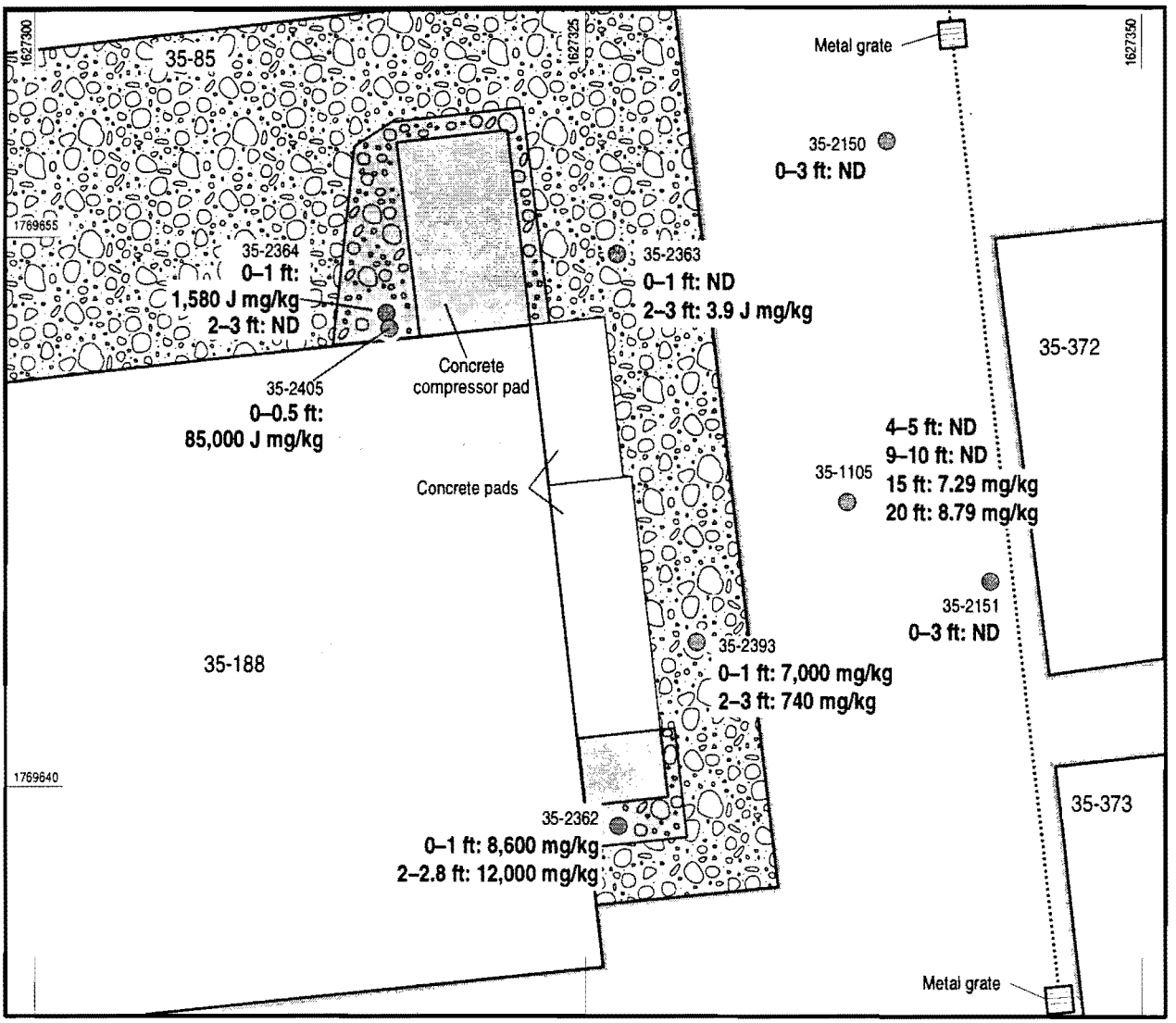
Part 2

Location ID	Sample ID	Depth (ft)	Media	Toluene	Trichloroethene	Xylenes(mixed)
SAL	N/A	N/A	N/A	1900	7.1	990
EQL	N/A	N/A	N/A	0.005	0.005	0.005
35-2362	0435-96-0072	0–1	Soil	0.002 J	0.021 J	<0.006 U
35-2362	0435-96-0073	2–2.8	Soil	<0.006 U	0.004 J	<0.006 U
35-2363	0435-96-0075	0–1	Soil	0.006 J	0.009 J	0.003 J
35-2363	0435-96-0076	2–3	Soil	<0.006 U	<0.006 U	<0.006 U
35-2364	0435-96-0077	0–1	Soil	<0.005 U	0.019 J	<0.005 U
35-2393	0435-96-0079	0–1	Soil	0.002 J	0.015 J	<0.005 U
35-2393	0435-96-0081	2–3	Soil	<0.006 U	0.002 J	<0.006 U
35-2405	0435-96-0096	0–0.5	Soil	NA	NA	NA

*mg/kg

TPH was also identified in seven of the nine fixed-site laboratory samples (including duplicate samples, which are not shown in Table 2.5-1) for which TPH analyses were performed. However, the TPH analyses for samples collected at Location ID Nos. 35-2363 and 35-2364 were suspect because the analytical results for the visibly stained soil showed relatively low levels of TPH. It was suspected that the low TPH values may have been due to the fact that weathered oil contains predominantly longer chain hydrocarbons than those captured in a standard TPH analysis. Therefore, a confirmatory sample (Location ID No. 35-2405) was collected adjacent to Location ID No. 35-2364. This sample was analyzed for longer chain hydrocarbons and was found to contain approximately 85,000 mg/kg TPH, which was the highest value measured among the RFI samples.

Figure 2.5-1 summarizes the results of the sample analyses for TPH.



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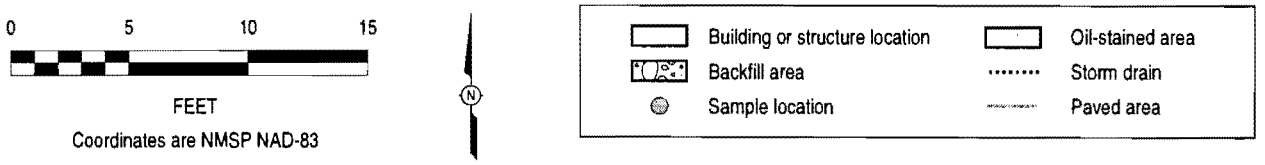

Figure 2.5-1. TPH soil concentrations in samples at PRS No. 35-014(f).

2.6 Phase I RFI Screening Assessment

Six inorganic chemicals (five with measured concentrations above UTL values) were carried forward from the background comparisons, and five detected organic chemicals were carried forward. Screening action level (SAL) values are available for all individual chemicals detected at this site except calcium. The maximum reported concentration of each chemical was compared with the SAL value; no SAL value was exceeded for any chemical.

Analytes are divided into two classes (noncarcinogens and chemical carcinogens) for the screening assessment, depending on which toxicological effect forms the basis of their SAL value, to evaluate possible additive effects within each class of chemical. The multiple constituent evaluations (MCEs) for noncarcinogenic and carcinogenic effects are presented in Table 2.6-1. The MCE results for noncarcinogens and chemical carcinogens are 0.28 and 0.43, respectively. Because the MCE values are less than unity for both classes of chemicals, adverse health effects associated with possible additivity in chemical toxicity is not identified at this site. Calcium was measured above the UTL value in one of nine samples. Calcium is an essential element that is present in a wide variety of foods and in relatively high concentrations in many drinking water sources. It is also among those elements that may be eliminated from a risk assessment based on professional judgment (EPA 1989, 8021). Because it was measured above background in only one sample and has no significant adverse toxicological effects, additional investigation of calcium is not proposed.

TABLE 2.6-1

MULTIPLE CHEMICAL EVALUATION FOR SOIL SAMPLES AT PRS No. 35-014(f)

Chemical	Location ID	Sample ID	Maximum Sample Value	Soil SAL	Normalized Value
Noncarcinogenic Effects (mg/kg)					
Antimony	35-2363	0435-96-0076	7.2 J	31	0.23
cis-1,2-Dichloroethene	35-2362	0435-96-0072	0.003 J	59	0.00005
Copper	35-2362	0435-96-0072	26.3	2800	0.01
Nickel	35-2364	0435-96-0078	46.5 J	1500	0.03
Silver	35-2363	0435-96-0075	2 J	383	0.005
Toluene	35-2363	0435-96-0075	0.006 J	1900	0.000003
				Normalized Sum	0.28
Carcinogenic Effects (mg/kg)					
Chromium	35-2364	0435-96-0078	90 J-	210	0.43
Tetrachloroethene	35-2393	0435-96-0079	0.002 J	7	0.0003
				Normalized Sum	0.43

TPH was detected in several samples at concentrations of several thousand parts per million and higher. In general, petroleum contamination is evaluated for human health risk by examining specific chemical components such as PAHs, benzene, and substituted benzenes. Phase I RFI data indicate that these specific chemicals are not present at this site and that no other chemicals present a possible human health risk. However, as described in Section 1.1.2 of the VCA plan (LANL 1996, 53783), gross TPH

contamination can restrict site use because of the potential for TPH migration through disturbed soils or because of odors generated in confined spaces. Therefore, TPH-contaminated soil was voluntarily removed to mitigate any potential future impacts, including the potential for contaminant migration caused by surface water runoff.

2.7 Derivation of Cleanup Levels

As described in Section 3.2 of the VCA plan (LANL 1996, 53783), the general methodology developed by the state of Massachusetts in Subpart I of the Revised Massachusetts Contingency Plan (Massachusetts Department of Environmental Protection 1993, 54257) was followed to define cleanup criteria. This methodology provides for the development of soil cleanup criteria for TPH contamination when the specific hazardous chemicals described above are not present. The recommended soil cleanup criteria are 2,500 mg/kg and 5,000 mg/kg for the soil depth intervals of 0 to 3 ft and below 3 ft, respectively.

3.0 REMEDIAL ACTIVITIES

3.1 Implementation

A phased approach was implemented for removing the contaminated soil, as described in Section 3.1 of the VCA plan (LANL 1996, 53783). Each phase of soil removal consisted of the excavation of soil to an appropriate depth, depending on the extent of contamination. An excavation depth of 0.5 to 1 ft (referred to as a "lift of soil") was removed, followed by visual site inspection. When visual inspection indicated that all visible contamination was removed, samples were collected and analyzed.

The VCA was performed on August 27 through August 29, 1996. Contaminated soil and concrete were excavated using a backhoe equipped with a bucket loader and, where appropriate, using hand-operated shovels and buckets. The contaminated materials were placed in a semitrailer truck and two roll-off containers, each holding approximately 15 yd^3. The waste materials were temporarily stored on-site before off-site disposal. During the VCA, storm water and surface water flow were prevented from entering and leaving the site by placing sand bags and plastic sheeting around the perimeter of the site.

Soil was excavated and removed to a depth of 3 ft near the former compressor site and to a depth of about 5 ft east of building TA-35-188, as shown in Figure 3.1-1. Visual site inspections of the excavation site were performed regularly to detect where TPH-contaminated soil remained to be cleaned up. The VCA plan provided for excavation to occur in the two areas mentioned above (LANL 1996, 53783). However, as a precautionary measure, excavation was also performed along the east wall of TA-35-188 between the two planned cleanup areas. Soil was excavated to a depth of 1.5 ft in this additional area, and no oil-stained soil was observed.

The collection of at least five verification samples was specified in Section 5.2.3 of the VCA plan (LANL 1996, 53783). However, based on field observations, only four verification samples were collected. The proposed fifth sample was to be collected in the unplanned excavation area between the two proposed cleanup areas. After removing soil to a depth of 1.5 ft, visual inspection did not show staining or evidence of suspected contamination; therefore, a verification sample was not collected from this area.

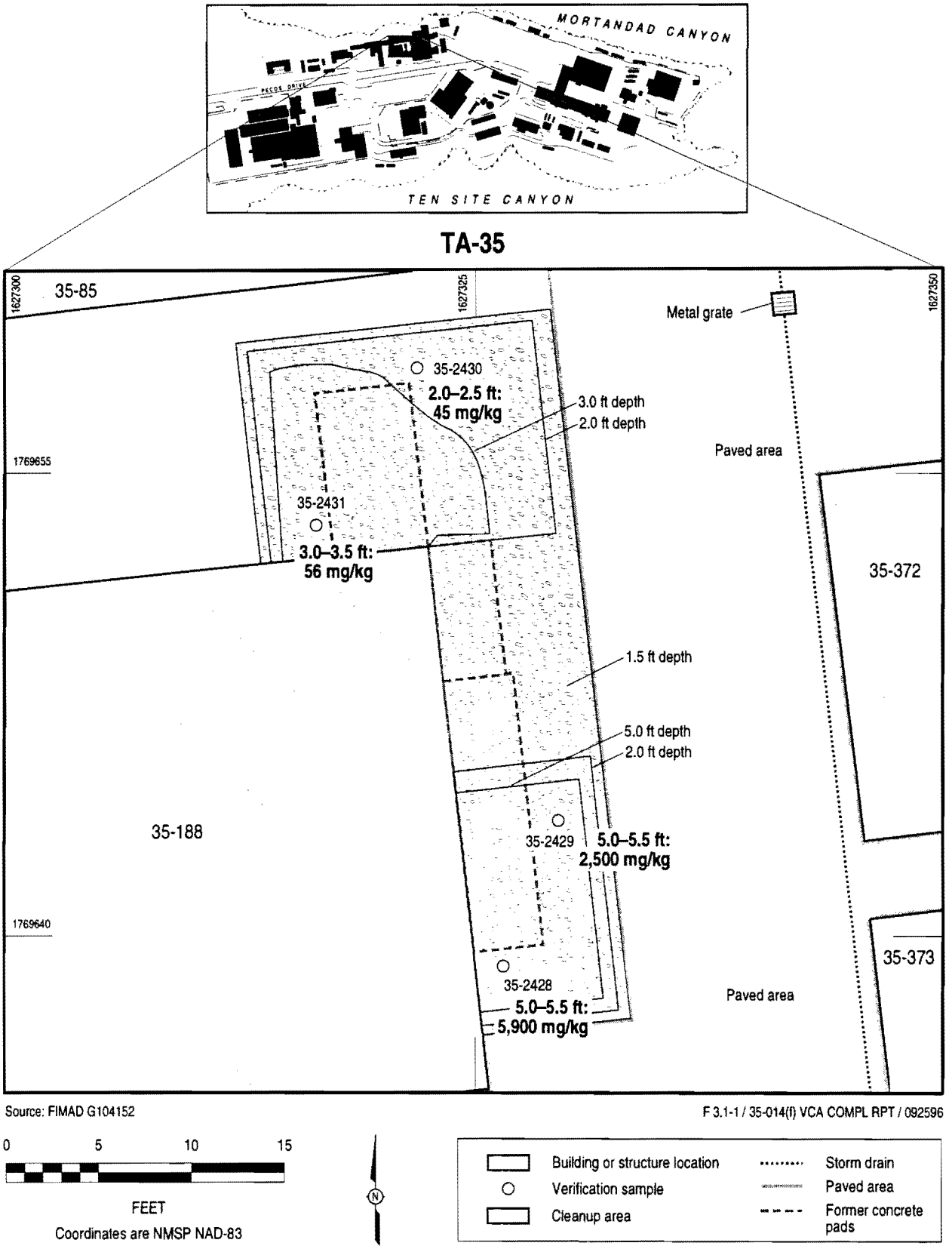

Figure 3.1-1. Excavation area and TPH soil concentrations in verification samples at PRS No. 35-014(f).

The excavation area extended southward along the east wall of TA-35-188 to the edge of the existing asphalt and eastward from the building to near the edge of the existing asphalt, as shown in Figure 3.1-1. The excavation extended to a depth of 5 ft at the east wall of TA-35-188, where bedrock tuff was encountered. The surface of the excavation showed no visual indication of oil staining. The total volume of excavated material was approximately 45 yd^3, which met the "Stop Work" criteria (LANL 1996, 52950) defined in Section 3.1 of the VCA plan. At this point, the VCA was reassessed as described in Section 3.3. Based on the reassessment, the VCA was halted. The site was backfilled with clean soil to the original grade on September 17 and 18, 1996, which concluded the VCA field activities.

3.2 Verification Sampling

Based on the results of the visual site inspections, additional excavation was performed at some sites. When the sites appeared to have been cleaned of TPH-contaminated soil, verification samples were collected for fixed-laboratory analyses. The verification soil samples (grab samples) were collected on August 29, 1996.

A total of four verification samples were collected at Location ID Nos. 35-2428 through 35-2431, as shown on Figure 3.1-1. Two soil samples were collected near the former compressor site at depths of 2.0 and 3.0 ft, and two soil samples were collected from the excavated area east of TA-35-188, both at a depth of 5 ft. The samples were analyzed for TPH at a fixed-site laboratory using EPA SW-846 Level III equivalent analytical methods (EPA 1986, 31733). The results of the analyses of the verification samples for TPH are shown in Table 3.2-1.

TABLE 3.2-1

RESULTS OF VERIFICATION SAMPLING FOR TPH

Location ID	Depth (ft)	Sample ID	Date Collected	TPH Result (mg/kg)	Qualifier
35-2428	5.0–5.5	0435-96-0143	8/29/96	5900	J
35-2429	5.0–5.5	0435-96-0144	8/29/96	2500	J
35-2430	2.0–2.5	0435-96-0145	8/29/96	45	
35-2431	3.0–3.5	0435-96-0146	8/29/96	56	

3.3 Conclusions and Recommendations

Based on the data presented in Section 2.0, PRS No. 35-014(f) will not pose a significant human health risk.

The verification samples collected from the former compressor site measured 45 mg/kg TPH (Location ID No. 35-2430, 2-ft depth) and 56 mg/kg TPH (Location ID No. 35-2431, 3-ft depth), which are well below the respective cleanup criteria. The contaminated soil in this area was very dark (from used gear oil), and the visual methods used during soil excavation were effective in guiding the cleanup at this site.

The verification samples collected east of TA-35-188 (where soil was excavated to a depth of 5 ft) measured 2,500 mg/kg TPH (Location ID No. 35-2429 about 6 ft from the building) and 5,900 mg/kg TPH (Location ID No. 35-2428 about 2 ft from the building). The TPH value at Location ID No. 35-2428 was

slightly higher than the cleanup level for soil deeper than 3 ft (LANL 1996, 53783). However, this sample was collected in bedrock tuff from material that did not exhibit any visual or olfactory indications of oil contamination. Therefore, the cleanup was completed to the extent that no visual or odor-based oil contamination remains at this site.

After the total volume of excavated material met the "Stop Work" criteria (LANL 1996, 52950), the VCA was halted, and the VCA plan was reassessed to determine if additional soil excavation was feasible or if the goals of the VCA had been satisfied with respect to best management practices. The goals of the VCA were to remove all visible and odor-emitting oil-contaminated soil, to remove the potential for contaminant migration via the surface water pathway, and to meet the derived cleanup criteria thereby preventing the possibility of future contaminant migration to surface water or restrictions on site use.

During the reassessment, it was observed that the area around Location ID No. 35-2428 was not visually contaminated and did not emit odor. This area was to be backfilled to a depth of at least 5 ft with clean soil, which would remove the potential for possibly contaminated material to come into contact with storm water. Backfilling would remove the potential for contaminant migration from the site via the surface water pathway and the potential for exposure of site workers to possibly contaminated surface soils. Therefore, additional excavation was deemed unnecessary.

Excavation was not extended beyond the exposed soil because the existing asphalt predates the oil spills, and contamination was not found beneath the asphalt in the UST and Phase I RFI samples east of TA-35-188 (see Section 2.1 and Section 2.5). Additional excavation into the bedrock tuff at Location ID No. 35-2428 would have required additional waste containers and the expense of transporting the material to an appropriate off-site disposal facility, which were difficult to justify because the potential for contaminant migration had already been removed.

On the basis of the summary presented here, it has been determined that the objective of the VCA has been successfully accomplished. This PRS is recommended for no further action based on criterion number 5 (LANL 1996, 54943).

4.0 WASTE MANAGEMENT

4.1 Types and Volumes of Waste

TPH-contaminated soil was the primary waste material generated by the VCA. The waste was characterized as TPH-contaminated soil greater than 1,000 mg/kg TPH. Therefore, the waste was characterized as New Mexico "Special Waste." Care was taken during the remediation process to segregate soil and other waste that contained TPH from non-TPH waste. Incidental waste from the VCA included personal protective equipment (such as nitrile gloves and KleenGuard coveralls) and dry decontamination process wastes (Kimwipes tissues, Fantastik spray cleaner, and polyvinyl sheeting). The approved Waste Characterization Strategy Form is attached to the VCA plan (LANL 1996, 53783).

Table 4.1-1 lists the estimated and actual types and volumes of waste that were generated during VCA activities. The waste from the VCA (approximately 45 yd^3) filled one semitrailer truck and two roll-off containers. The waste profile forms are attached in Appendix G of this VCA report.

TABLE 4.1-1

TOTAL WASTE FOR PRS No. 35-014(f)

Item	Waste Type	Anticipated Volume	Actual Volume
Personal protective equipment	Solid	One 55-gal. drum	One-half 55-gal. drum
TPH-contaminated soil	Solid	45 yd^3	45 yd^3
TPH-stained concrete	Solid	1 yd^3	1 yd^3
Clean concrete	Solid	1 yd^3	1 yd^3
Decontamination waste	Solid	One 55-gal. drum	One-half 55-gal. drum

4.2 Method of Management and Disposal

The TPH-contaminated waste was packaged in one semitrailer truck, two roll-off containers, and one 55-gal. drum. Before the waste was transported off-site, the containers were labeled and stored on-site and managed in accordance with the Environmental Restoration (ER) Project standard operating procedure 1.06, R1, "Management of Environmental Restoration Project Wastes" (LANL 1991, 21556). The waste was disposed of off-site at a landfill that is approved to receive New Mexico Special Waste. On September 10 and 11, 1996, the waste was transported to the Chemical Waste Management, Inc., facility at Colorado Springs, Colorado, for disposal.

5.0 REFERENCES

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6.0 APPENDICES

A. Quality Assurance/Quality Control Activities

This appendix addresses the results of quality assurance and quality control (QC) procedures that were implemented during the RFI and the VCA sampling and analysis activities at PRS No. 35-014(f).

A.1 Sample Analyses

All samples requiring chemical and radiological analyses were collected and handled following ER Project chain-of-custody protocols described in the standard operating procedure LANL-ER-SOP-01.04, R3, "Sample Control and Field Documentation" (LANL 1991, 21556). Samples collected as part of the RFI were submitted to the Sample Management Office (SMO) for shipment to a fixed-site laboratory or were submitted directly to an on-site mobile laboratory facility. Samples collected as part of the VCA were submitted to the SMO for shipment to a fixed-site laboratory.

A.1.1 Analytical Methods

Table A.1.1-1 summarizes the analytical methods employed in the fixed-site and mobile laboratory facilities for the organic and inorganic analytical suites for samples collected at this PRS. Analyses performed in fixed-site laboratories follow the EPA SW-846 methods (or the equivalent EPA Contract Laboratory Program statements of work) for organic (EPA 1986, 31733) and inorganic (EPA 1986, 31732) analyses. The requirements for analyses performed by the fixed-site laboratories are described in the ER Project statement of work for analytical services (LANL 1995, 49738). All VCA verification samples were analyzed at fixed-site laboratory facilities.

TABLE A.1.1-1

ANALYTICAL METHODS

	Analytical Method	
Analyte Suite	**Fixed-Site Laboratory**	**Mobile Laboratory**
Inorganic Chemicals		
Trace metals	ICPES, GFAA, ICPMS	N/A
Organic Chemicals		
Polychlorinated biphenyl compounds	GC/ECD	GC/ECD
Polycyclic aromatic hydrocarbons	N/A	GC/FID
Semivolatile organic compounds	GC/MS	N/A
Total petroleum hydrocarbons	GC/FID	N/A
Volatile organic compounds	GC/MS	GC/MS

The analytical methods employed in the mobile laboratory facilities were modifications of the methods used by the internal laboratories at Los Alamos National Laboratory. Further details about the analytical procedures for inorganic and organic chemicals are given in Sections A.2 through A.4 of this appendix.

A.1.2 Data Validation

Before performing a screening assessment for this PRS, the RFI data set underwent verification and routine validation procedures. All VCA verification data were verified and validated. Data verification and validation procedures are used to determine whether analytical data packages have been generated according to specifications, are of known quality, and contain the information necessary to determine data sufficiency for decision making. The data verification procedure checked that

- analytical results had been received for all samples submitted for analysis,
- the correct analysis had been performed for each sample,
- the analytical data had been reported correctly, and
- all analytical data had been correctly transmitted to the Facility for Information Management, Analysis, and Display (FIMAD).

Appropriate corrective actions were initiated to obtain missing analytical data and to correct errors in the data reporting.

The routine data validation process involved the comparison of quality indicators with clearly defined criteria or limits. Quality indicators such as surrogate recoveries, method blank measurements, holding times, and the differences between duplicate measurements were evaluated following EPA guidelines for inorganic data review (EPA 1994, 48639) and organic data review (EPA 1994, 48640). During the validation process, data that did not meet quality criteria were designated by qualifier flags. Qualifiers resulting from the validation process are shown in the analytical data tables included in this VCA report. Table A.1.2-1 lists an explanation of the data qualifiers used in this VCA report.

TABLE A.1.2-1

EXPLANATION OF DATA QUALIFIERS USED IN THE DATA VALIDATION PROCEDURE

Qualifier	Explanation
U	The analyte was analyzed for but not detected. Reported value is the sample quantitation limit or detection limit.
J	The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample.
J+	Reported value is an estimate and likely biased high.
J–	Reported value is an estimate and likely biased low.
UJ	The analyte was analyzed for but not detected. Reported value is an estimate of the sample quantitation limit or detection limit.
R	The sample results are rejected because of serious deficiencies in the ability to analyze the sample and meet quality control criteria; presence or absence cannot be verified.
S	The sample results were obtained using a screening analytical method performed in a mobile laboratory facility.

A.2 Inorganic Analyses

Trace metals in soil samples collected at this PRS were analyzed by EPA SW-846 methods (EPA 1986, 31732) (or the Contract Laboratory Program equivalent). For the Phase I RFI sampling activities, nine soil samples were analyzed for trace metals by EPA SW-846 methods at a fixed-site laboratory. No samples were analyzed for trace metals during the VCA.

The accuracy of the EPA SW-846 measurements was monitored by the concurrent analysis of aqueous and solid laboratory control samples (LCSs). Results for individual soil samples were qualified on the basis of the LCS that was analyzed in the same batch, according to the criteria given in the national functional guidelines for data review (EPA 1994, 48639).

The bias of the EPA SW-846 measurements was assessed by the analysis of matrix spike samples. The analytical results for individual samples were qualified according to EPA guidelines if the individual matrix spike recoveries indicated an unacceptable bias in the measurement of individual analytes. For the Phase I RFI samples, matrix spike recoveries for arsenic, chromium, lead, manganese, and selenium were low. The sample results have been qualified accordingly (see Table A.4-1 in Section A.4 of this appendix).

The precision of the EPA SW-846 measurements was assessed by the analysis of laboratory duplicate samples. The EPA guidelines suggest a control criteria of ±35% relative percent difference (RPD) for the assessment of duplicate sample results because laboratory variability arising from the subsampling of heterogeneous soil samples is a common occurrence. The analytical results for individual samples were qualified according EPA guidelines if duplicate sample analysis indicated precision control problems with the measurement. The RPD for nickel exceeded 35%; all other duplicate sample analyses were within control criteria for the sample analyses evaluated for this VCA report.

Technical holding times were met for all analyses.

A.3 Organic Analyses

Soil samples collected at this PRS during the Phase I RFI were analyzed for VOCs, SVOCs, PAHs, PCBs, and TPH using the methods described in Table A.1.1-1. Samples were analyzed at either fixed-site laboratories or at a mobile laboratory facility. In the following sections, which focus on the laboratory QC activities, the differences between the fixed-site and mobile laboratory methods are also discussed. The mobile laboratory methods generally used less effective extraction methods and abbreviated QC procedures to save time and costs. Consequently, the mobile laboratory sample results should be considered screening level data with a possible low bias (compared with EPA SW-846 methods) and are qualified with an "S" flag.

A.3.1 Volatile Organic Compound Analysis

Soil samples were analyzed for VOCs at either fixed-site or mobile laboratory facilities. Sample analyses performed at fixed-site laboratories used either EPA SW-846 Method 8260 or the Contract Laboratory Program OLM01.8 protocol to detect low-level contamination. Samples were extracted using the SW-5030 purge and trap method. The ER Project analytical services statement of work (LANL 1995, 49738) contains the detailed analyte lists, EQLs, required QC procedures, and the acceptance criteria for analyses performed by external laboratories. The contract-required EQLs for soil samples are less than the soil SALs for all VOC analytes.

Soil samples were analyzed in the mobile laboratory facility according to Laboratory Method No. MLO720 (LANL 1993, 31794), which is a modification of the EPA SW-846 Method 8260 gas chromatography/mass spectrometry (GC/MS) procedure. Samples were extracted using the SW-5030 purge and trap method. Tier 1 QC procedures were implemented, where Tier 1 requirements consist of a daily one-point calibration check and a daily method blank analysis. System performance was monitored by the addition of three surrogate compounds. Sample results were reported on a wet weight basis and therefore are biased low. The EQLs for this method are generally the same as for the fixed-site laboratory method.

For the Phase I RFI at this PRS, six soil samples were analyzed at the mobile laboratory facility; no target compounds were detected. The surrogate recoveries in some of the mobile laboratory analyses were high, but no qualification of the data is necessary because no target compounds were detected.

Nine RFI samples were analyzed for VOCs at a fixed-site laboratory facility. Acetone and methylene chloride were detected in some of these fixed-site laboratory samples. These compounds were also present in the blank sample and are attributed to laboratory contamination. At Location ID Nos. 35-2362 and 35-2363, unknown organic compounds were reported as tentatively identified compounds (TICs). Table A.4.1 (see Section A.4 in this appendix) lists the data qualifications for the fixed-site laboratory VOC result.

For VCA verification sampling at this PRS, no samples were collected for the analysis of VOCs.

All technical holding times for analysis were met for the samples evaluated in this VCA report.

A.3.2 Semivolatile Organic Compound Analysis

Soil samples were analyzed for SVOCs at fixed-site laboratory facilities. Sample analyses performed at fixed-site laboratories used either EPA SW-846 Method 8270 or the Contract Laboratory Program OLM01.8 protocol to detect low-level contamination. The ER Project analytical services statement of work (LANL 1995, 49738) contains the detailed analyte lists, EQLs, required QC procedures, and the acceptance criteria for analyses performed by external laboratories. The required QC procedures for the analyses performed by external laboratories.

Seven SVOC analytes have soil contract-required EQLs for the fixed-site laboratory analysis (0.330 mg/kg) that are greater than the soil SAL: m-benzidine (0.0019 mg/kg), benzo[a]pyrene (0.061 mg/kg), bis(2-chloroethyl) ether (0.074 mg/kg), dibenz[a,h]anthracene (0.061 mg/kg), hexachlorobenzene (0.280 mg/kg), N-nitrosodi-n-propylamine (0.063 mg/kg), and N-nitrosodimethylamine (0.0087 mg/kg). No standard, readily available method exists that could achieve EQLs as low as several parts per billion in soil for these compounds.

For the Phase I RFI at this PRS, nine soil samples were collected and analyzed for SVOCs at a fixed-site laboratory using EPA SW-846 Method 8270. (Six samples were screened for PAHs at the mobile laboratory facility; see Section A.3.3 in this appendix.) Di-n-butylphthalate detected in the blank sample and some of the soil samples is attributed to laboratory contamination. Bis(2-ethylhexyl)phthalate detected in five of the samples is also attributed to laboratory contamination. No SVOC target analytes other than the phthalates were detected in the RFI samples. Several samples required dilution because of the presence of high levels of hydrocarbon contamination. Sample-specific data validation results are given in Table A.4-1 (in this Section A.4 of this appendix).

For VCA verification sampling at this PRS, no samples were collected for the analysis of SVOCs.

All technical holding times were met for the fixed-site SVOC laboratory analyses.

A.3.3 Polycyclic Aromatic Hydrocarbon Analysis

To screen for the presence of SVOCs, six soil samples collected during the Phase I RFI were analyzed for PAH compounds at the mobile laboratory facility. The gas chromatography/flame ionization detector (GC/FID) method used is a modification of SW-846 Method 8100. The samples were extracted into methylene chloride using rotary table agitation according to the procedure described in Laboratory Method No. MLO510 (LANL 1993, 31794). Tier 1 QC procedures were implemented, where Tier 1 requirements consist of a daily one-point calibration check and a daily method blank analysis. Sample results were reported on a wet weight basis and are therefore biased low.

The analyte list consisted of the 16 PAHs listed in Table A.3.3-1. Benzo[b]fluoranthene and benzo[k]fluoranthene are not resolved. Dibenz[a,h]anthracene was also included as a target analyte for some analyses. A nominal EQL of 0.1 mg/kg is cited for this method, which is less than the soil SALs for all the target analytes (for which SALs are available) except benzo[a]pyrene and dibenz[a,h]anthracene. Other extractable organic compounds present in the sample, but not identified as target analytes, are quantitated to an EQL of 5 mg/kg using the response factor for naphthalene and reported as "Total Extractable Organic Compounds."

TABLE A.3.3-1

ANALYTE LIST FOR POLYCYCLIC AROMATIC HYDROCARBON ANALYSIS USING MODIFIED SW-8100 METHOD

Analyte	EQL (mg/kg)	SAL (mg/kg)
Acenaphthene	0.1	360
Acenaphthylene	0.1	N.A.
Anthracene	0.1	19
Benz[a]anthracene	0.1	0.61
Benzo[a]pyrene	0.1	0.061
Benzo[b]fluoranthene/Benzo[k]fluoranthene	0.1	0.61/6.1
Benzo[g,h,i]perylene	0.1	N.A.
Chrysene	0.1	24
Dibenz[a,h]anthracene	0.1	0.061
Fluoranthene	0.1	2600
Fluorene	0.1	300
Indeno[1,2,3-cd]pyrene	0.1	0.61
Naphthalene	0.1	800
Phenanthrene	0.1	N.A.
Pyrene	0.1	2000

System performance was monitored by the addition of a surrogate compound, tetradecane. For the six samples analyzed, the average surrogate recovery was 80 ±18%, which indicates acceptable analytical bias. No target analytes were detected in samples collected from this PRS, neither were any nontarget extractable organic compounds detected.

All technical holding times were met for the PAH mobile laboratory analyses.

A.3.4 Polychlorinated Biphenyl Compound Analysis

Soil samples were analyzed for PCBs at either fixed-site or mobile laboratory facilities. Sample analyses performed by external fixed-site laboratories used either the EPA SW-8081 gas chromatography/electron capture detection (GC/ECD) method (dual-column option) or the Contract Laboratory Program OLM01.8 protocol. The ER Project analytical services statement of work (LANL 1995, 49738) contains the detailed analyte lists, EQLs, required QC procedures, and the acceptance criteria for analyses performed by external laboratories. The statement of work requires analysis for Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260. The QC requirements include external calibration, monitoring of the recovery of either of two surrogate compounds (decachlorobiphenyl or tetrachloro-m-xylene), and second-column confirmation of any detected Aroclors. The contract-required EQL is 0.033 mg/kg for soil samples, which is less than the soil SAL of 1 mg/kg for mixed PCBs.

Soil samples were analyzed in the mobile laboratory facility according to Laboratory Method No. MLO410 (LANL 1993, 31794), which is a modification of the EPA SW-846 Method 8081 GC/ECD (single-column option) procedure. The samples were extracted into hexane using rotary table agitation according to the procedure described in Laboratory Method No. MLO510. Tier 1 QC procedures were implemented, where Tier 1 requirements consist of a daily one-point calibration check and a daily method blank analysis. System performance was monitored by the addition of a surrogate compound (2,4,5-tribromobiphenyl), but surrogate recovery was not consistently monitored. Samples were analyzed for Aroclors 1242, 1254, and 1260. The soil EQL is 1 mg/kg, which is equivalent to the SAL value for mixed PCBs. Sample results were reported on a wet weight basis and are therefore biased low.

For the Phase I RFI at this PRS, six soil samples were collected for the analysis of PCBs at the mobile laboratory facility, and nine soil samples were collected for fixed-site laboratory analyses. No target compounds were detected in any samples.

In the mobile laboratory analyses, system performance was monitored by the addition of a surrogate compound, 2,4,5 tribromobiphenyl. The average surrogate recovery for the six samples collected at this PRS was 93 ± 7%, which indicates acceptable analytical bias.

All technical holding times were met for both the mobile laboratory facility and the fixed-site laboratory analyses.

A.3.5 Total Petroleum Hydrocarbon Analysis

For the Phase I RFI sampling at this PRS, nine soil samples were analyzed for TPH at a fixed-site laboratory facility. The samples were tested for diesel range (C_8 to C_{39}) TPH. A modification of the EPA SW-846 Method 8015, the GC/FID method, was used. All obtainable surrogate recoveries were within control criteria. Most of the samples required dilution because of the presence of high levels of target compounds.

Quantitation of diesel-range petroleum hydrocarbons in samples collected at Location ID Nos. 35-2362 and 35-2393 was based on a motor oil standard. The fingerprint exhibited by these samples was characteristic of light lubricating oil centered at approximately C_{18}. Samples collected at Location ID Nos. 35-2363, 35-2364, and 35-2405 contained late-eluting compounds outside the retention time region commonly associated with diesel-range hydrocarbons. The higher molecular weight hydrocarbons were tentatively identified as weathered motor oil and were quantitated using the motor oil standard.

Four VCA verification samples were analyzed for diesel-range TPH. The two samples collected at Location ID Nos. 35-2428 and 35-2429 required dilution because of high levels of hydrocarbons in the C_{12} to C_{32} range; results for these samples should be regarded as estimated. The two samples collected at Location ID Nos. 35-2430 and 35-2431 contained low levels of hydrocarbons in the C_{12} to C_{36} range. Sample-specific data validation results are given in Table A.4-1 in Section A.4 of this appendix.

A.4 Data Quality Evaluation for RFI and VCA Verification Samples

Qualifications of individual sample results for fixed-site laboratory analyses of Phase I RFI and VCA verification samples collected at this PRS are presented in Table A.4-1.

TABLE A.4-1

DATA QUALITY EVALUATION FOR PRS No. 35-014(f)

Request No.	Location ID	Sample ID	Analytical Suite	QC Parameter	Explanation
2236	35-2362	0435-96-0072	TPH	Accuracy	The result for diesel-range hydrocarbons (8,600 mg/kg) should be regarded as estimated (J) because the sample was diluted by a factor of 20.
2236	35-2362	0435-96-0072	VOC	Accuracy	Because internal standard areas and surrogate recoveries were outside EPA QC limits, result for trichloroethene (0.021 mg/kg) should be regarded as estimated (J).
2236	35-2362	0435-96-0072	VOC	Accuracy	Methylene chloride (0.060 mg/kg) attributed to laboratory contamination.
2236	35-2362	0435-96-0072	VOC	Accuracy	Because internal standard areas and surrogate recoveries were outside EPA QC limits, target compound EQLs should be regarded as estimated (UJ).
2236	35-2362	0435-96-0072	VOC	Accuracy	The sample result for toluene (0.002 mg/kg) should be regarded as estimated (J).
2236	35-2362	0435-96-0073	SVOC	Accuracy	Di-n-butylphthalate (0.21 mg/kg) attributed to laboratory contamination.
2236	35-2362	0435-96-0073	TPH	Accuracy	The result for diesel-range hydrocarbons (12,000 mg/kg) should be regarded as estimated (J) because the sample was diluted by a factor of 20.
2236	35-2362	0435-96-0073	VOC	Accuracy	The sample result for trichloroethene (0.004 mg/kg) should be regarded as estimated (J).
2236	35-2362	0435-96-0073	VOC	Accuracy	Acetone (0.018 mg/kg) and methylene chloride (0.054 mg/kg) attributed to laboratory contamination.

TABLE A.4-1(continued)

DATA QUALITY EVALUATION FOR PRS No. 35-014(f)

Request No.	Location ID	Sample ID	Analytical Suite	QC Parameter	Explanation
2236	35-2362	0435-96-0073	VOC	Accuracy	Because internal standard areas and surrogate recoveries were outside EPA QC limits, target compound EQLs should be regarded as estimated (UJ).
2236	35-2362	0435-96-0073	VOC	Accuracy	Unknown organic (0.06 mg/kg) reported as TIC.
2236	35-2363	0435-96-0075	TPH	Accuracy	The EQL for diesel-range hydrocarbons should be regarded as estimated (UJ) because the sample was diluted by a factor of 5.
2236	35-2363	0435-96-0075	VOC	Accuracy	Because internal standard areas and surrogate recoveries were outside EPA QC limits, results for trichloroethene (0.009 mg/kg) and toluene (0.006 mg/kg) should be regarded as estimated (J).
2236	35-2363	0435-96-0075	VOC	Accuracy	Ten unknown TICs reported (0.008–0.050 mg/kg).
2236	35-2363	0435-96-0075	VOC	Accuracy	Acetone (0.025 mg/kg) and methylene chloride (0.030 mg/kg) attributed to laboratory contamination.
2236	35-2363	0435-96-0075	VOC	Accuracy	Because internal standard areas and surrogate recoveries were outside EPA QC limits, target compound EQLs should be regarded as estimated (UJ).
2236	35-2363	0435-96-0075	VOC	Accuracy	Sample result for mixed xylenes (0.003 mg/kg) should be regarded as estimated (J).
2236	35-2363	0435-96-0076	TPH	Accuracy	The result for diesel-range hydrocarbons (3.9 mg/kg) should be regarded as estimated (J).
2236	35-2363	0435-96-0076	VOC	Accuracy	Methylene chloride (0.024 mg/kg) attributed to laboratory contamination.
2236	35-2364	0435-96-0077	SVOC	Accuracy	Bis(2-ethylhexyl)phthalate (0.75 mg/kg) attributed to laboratory contamination.
2236	35-2364	0435-96-0077	SVOC	Accuracy	Sample was diluted by a factor of 10 because of hydrocarbon contamination; the sample EQLs should be regarded as estimated (UJ).
2236	35-2364	0435-96-0077	TPH	Accuracy	The result for diesel-range hydrocarbons (1,580 mg/kg) should be regarded as estimated (J) because the sample was diluted by a factor of 5.
2236	35-2364	0435-96-0077	VOC	Accuracy	The sample result for *cis*-1,2-dichloroethene (0.003 mg/kg) should be regarded as estimated (J).
2236	35-2364	0435-96-0077	VOC	Accuracy	Because of internal standard areas and surrogate recoveries being outside EPA QC limits, result for trichloroethene (0.017 mg/kg) should be regarded as estimated (J).
2236	35-2364	0435-96-0077	VOC	Accuracy	Because of internal standard areas and surrogate recoveries being outside EPA QC limits, target compound EQLs should be regarded as estimated (UJ).
2236	35-2364	0435-96-0077	VOC	Accuracy	Acetone (0.031 mg/kg) and methylene chloride (0.059 mg/kg) attributed to laboratory contamination.

TABLE A.4-1(continued)

DATA QUALITY EVALUATION FOR PRS No. 35-014(f)

Request No.	Location ID	Sample ID	Analytical Suite	QC Parameter	Explanation
2236	35-2364	0435-96-0078	TPH	Accuracy	The EQL for diesel-range hydrocarbons should be regarded as estimated (UJ) because the sample was diluted by a factor of 5.
2236	35-2364	0435-96-0078	VOC	Accuracy	Acetone (0.009 mg/kg) and methylene chloride (0.031 mg/kg) attributed to laboratory contamination.
2236	35-2393	0435-96-0079	SVOC	Accuracy	Sample was diluted by a factor of 5 because of hydrocarbon contamination; the sample EQLs should be regarded as estimated (J).
2236	35-2393	0435-96-0079	SVOC	Accuracy	Di-n-butylphthalate (0.320 mg/kg) and bis(2-ethylhexyl)phthalate (0.650 mg/kg) attributed to laboratory contamination.
2236	35-2393	0435-96-0079	TPH	Accuracy	The result for diesel-range hydrocarbons (7,000 mg/kg) should be regarded as estimated (J) because the sample was diluted by a factor of 20.
2236	35-2393	0435-96-0079	VOC	Accuracy	Acetone (0.007 mg/kg) and methylene chloride (0.021 mg/kg) attributed to laboratory contamination.
2236	35-2393	0435-96-0079	VOC	Accuracy	Because of internal standard areas and surrogate recoveries being outside EPA QC limits, result for trichloroethene (0.014 mg/kg) should be regarded as estimated (J).
2236	35-2393	0435-96-0079	VOC	Accuracy	Sample results for tetrachloroethene (0.002 mg/kg) and toluene (0.002 mg/kg) should be regarded as estimated (J).
2236	35-2393	0435-96-0079	VOC	Accuracy	Because internal standard areas and surrogate recoveries were outside EPA QC limits, target compound EQLs should be regarded as estimated (UJ).
2236	35-2393	0435-96-0080	SVOC	Accuracy	Di-n-butylphthalate (0.270 mg/kg) and bis(2-ethylhexyl)phthalate (0.670 mg/kg) attributed to laboratory contamination.
2236	35-2393	0435-96-0080	SVOC	Accuracy	Sample was diluted by a factor of 5 because of hydrocarbon contamination; the sample EQLs should be regarded as estimated (UJ).
2236	35-2393	0435-96-0080	TPH	Accuracy	The result for diesel-range hydrocarbons (6,500 mg/kg) should be regarded as estimated (J) because the sample was diluted by a factor of 20.
2236	35-2393	0435-96-0080	VOC	Accuracy	Methylene chloride (0.012 mg/kg) attributed to laboratory contamination.
2236	35-2393	0435-96-0080	VOC	Accuracy	Because internal standard areas and surrogate recoveries were outside EPA QC limits, result for trichloroethene (0.009 mg/kg) should be regarded as estimated (J).
2236	35-2393	0435-96-0080	VOC	Accuracy	Because internal standard areas and surrogate recoveries were outside EPA QC limits, target compound EQLs should be regarded as estimated (UJ).

TABLE A.4-1(continued)

DATA QUALITY EVALUATION FOR PRS No. 35-014(f)

Request No.	Location ID	Sample ID	Analytical Suite	QC Parameter	Explanation
2236	35-2393	0435-96-0080	VOC	Accuracy	Sample result for *cis*-1,2-dichloroethene (0.001 mg/kg) should be regarded as estimated (J).
2236	35-2393	0435-96-0081	SVOC	Accuracy	Di-n-butylphthalate (0.048 mg/kg) and bis(2-ethylhexyl)phthalate (0.098 mg/kg) attributed to laboratory contamination.
2236	35-2393	0435-96-0081	TPH	Accuracy	The result for diesel-range hydrocarbons (740 mg/kg) should be regarded as estimated (J) because the sample was diluted by a factor of 5.
2236	35-2393	0435-96-0081	VOC	Accuracy	Sample result for trichloroethene (0.002 mg/kg) should be regarded as estimated (J).
2236	35-2393	0435-96-0081	VOC	Accuracy	Acetone (0.006 mg/kg) and methylene chloride (0.012 mg/kg) attributed to laboratory contamination.
2237	35-2362	0435-96-0072	Inorganic	Precision	The RPD for nickel in the duplicate analysis is greater than 20%; the result for nickel should be regarded as estimated (J).
2237	35-2362	0435-96-0072	Inorganic	Accuracy	The results for arsenic, beryllium, cobalt, mercury, potassium, and thallium should be regarded as estimated (J) because these analytes were detected below the required detection limit but above the instrument detection limit.
2237	35-2362	0435-96-0072	Inorganic	Accuracy	The matrix spike recoveries of arsenic, chromium, lead, manganese, and selenium are low; the results for these analytes should be regarded as estimated and biased low (J-).
2237	35-2362	0435-96-0073	Inorganic	Accuracy	The matrix spike recoveries of arsenic, chromium, lead, manganese, and selenium are low; the results for these analytes should be regarded as estimated and biased low (J-).
2237	35-2362	0435-96-0073	Inorganic	Precision	The RPD for nickel in the duplicate analysis is greater than 20%; the result for nickel should be regarded as estimated (J).
2237	35-2363	0435-96-0075	Inorganic	Accuracy	The results for arsenic, beryllium, cobalt, mercury, potassium, silver, and sodium should be regarded as estimated (J) because these analytes were detected below the required detection limit but above the instrument detection limit.
2237	35-2363	0435-96-0075	Inorganic	Accuracy	The matrix spike recoveries of arsenic, chromium, lead, manganese, and selenium are low; the results for these analytes should be regarded as estimated and biased low (J-).
2237	35-2363	0435-96-0075	Inorganic	Precision	The RPD for nickel in the duplicate analysis is greater than 20%; the result for nickel should be regarded as estimated (J).

TABLE A.4-1(continued)

DATA QUALITY EVALUATION FOR PRS No. 35-014(f)

Request No.	Location ID	Sample ID	Analytical Suite	QC Parameter	Explanation
2237	35-2363	0435-96-0076	Inorganic	Accuracy	The results for antimony, arsenic, beryllium, cobalt, potassium, and sodium should be regarded as estimated (J) because these analytes were detected below the required detection limit but above the instrument detection limit.
2237	35-2363	0435-96-0076	Inorganic	Accuracy	The matrix spike recoveries of arsenic, chromium, lead, manganese, and selenium are low; the results for these analytes should be regarded as estimated and biased low (J-).
2237	35-2363	0435-96-0076	Inorganic	Precision	The RPD for nickel in the duplicate analysis is greater than 20%; the result for nickel should be regarded as estimated (J).
2237	35-2364	0435-96-0077	Inorganic	Accuracy	The results for arsenic, beryllium, cobalt, and sodium should be regarded as estimated (J) because these analytes were detected below the required detection limit but above the instrument detection limit.
2237	35-2364	0435-96-0077	Inorganic	Accuracy	The matrix spike recoveries of arsenic, chromium, lead, manganese, and selenium are low; the results for these analytes should be regarded as estimated and biased low (J-).
2237	35-2364	0435-96-0077	Inorganic	Precision	The RPD for nickel in the duplicate analysis is greater than 20%; the result for nickel should be regarded as estimated (J).
2237	35-2364	0435-96-0078	Inorganic	Accuracy	The results for arsenic, beryllium, cobalt, and sodium should be regarded as estimated (J) because these analytes were detected below the required detection limit but above the instrument detection limit.
2237	35-2364	0435-96-0078	Inorganic	Accuracy	The matrix spike recoveries of arsenic, chromium, lead, manganese, and selenium are low; the results for these analytes should be regarded as estimated and biased low (J-).
2237	35-2364	0435-96-0078	Inorganic	Precision	The RPD for nickel in the duplicate analysis is greater than 20%; the result for nickel should be regarded as estimated (J).
2237	35-2393	0435-96-0079	Inorganic	Accuracy	The results for arsenic, beryllium, cobalt, magnesium, potassium, sodium, and vanadium should be regarded as estimated (J) because these analytes were detected below the required detection limit but above the instrument detection limit.
2237	35-2393	0435-96-0079	Inorganic	Accuracy	The matrix spike recoveries of arsenic, chromium, lead, manganese, and selenium are low; the results for these analytes should be regarded as estimated and biased low (J-).

TABLE A.4-1(continued)

DATA QUALITY EVALUATION FOR PRS No. 35-014(f)

Request No.	Location ID	Sample ID	Analytical Suite	QC Parameter	Explanation
2237	35-2393	0435-96-0079	Inorganic	Precision	The RPD for nickel in the duplicate analysis is greater than 20%; the result for nickel should be regarded as estimated (J).
2237	35-2393	0435-96-0080	Inorganic	Accuracy	The results for antimony, arsenic, beryllium, cobalt, nickel, potassium, and sodium should be regarded as estimated (J) because these analytes were detected below the required detection limit but above the instrument detection limit.
2237	35-2393	0435-96-0081	Inorganic	Accuracy	The results for arsenic, barium, beryllium, copper, magnesium, potassium, sodium, and vanadium should be regarded as estimated (J) because these analytes were detected below the required detection limit but above the instrument detection limit.
2237	35-2393	0435-96-0081	Inorganic	Accuracy	The matrix spike recoveries of arsenic, chromium, lead, manganese, and selenium are low; the results for these analytes should be regarded as estimated and biased low (J-).
2237	35-2393	0435-96-0081	Inorganic	Precision	The RPD for nickel in the duplicate analysis is greater than 20%; the result for nickel should be regarded as estimated (J).
2452	35-2405	0435-96-0096	TPH	Accuracy	Sample contained weathered motor oil; sample result for TPH (85,000 mg/kg) should be regarded as estimated (J).
2578	35-2428	0435-96-0143	TPH	Accuracy	The concentration of diesel-range hydrocarbons (5,900 mg/kg) should be regarded as estimated (J) because the sample was diluted by a factor of 5.
2578	35-2429	0435-96-0144	TPH	Accuracy	The concentration of diesel-range hydrocarbons (2,500 mg/kg) should be regarded as estimated (J) because the sample was diluted by a factor of 5.

B. RFI Characterization Data

All analytical data are available in FIMAD. If FIMAD is not accessible, data will be provided upon request.

C. Before and After Cost Comparison

Table C-1 shows the estimated and actual costs for completing the VCA.

TABLE C-1

COST WORKSHEET

Category	Estimated Cost	Actual Cost
Field Preparation		
VCA plan preparation	$2,500	$2,000
VCA plan technical edit and review	$1,000	$1,000
Preparation of Waste Characterization Strategy Form	$1,000	$500
Preparation of Spill Prevention, Control, and Countermeasures Plan	$500	$500
Preparation of site-specific health and safety plan	$2,000	$1,000
Subtotal	**$7,000**	**$5,000**
Field Activities		
Field unit oversight and sampling (field team leader and site safety officer)	$2,500	$2,000
Subcontractors		
Remove air compressor and concrete	$1,000	$500
Soil excavation	$2,000	$2,000
Site restoration (hauling and compaction)	$1,000	$500
Fill materials	$400	$400
Waste container rental (roll-offs)	$200	$200
Subcontractor (disposal of solid waste)	$1,500	$1,500
Subcontractor (transportation of waste)	$3,600	$2,400
Subcontractor (transportation demurrage)	$400	$400
Subtotal	**$12,600**	**$9,900**
Analytical Costs		
Radiological van (gross α,β,γ screening for waste characterization) (split cost)	$1,000	$1,000
Laboratory TPH	$1,700	$1,360
Subtotal	**$2,700**	**$2,360**
Final Activities		
Acceptance inspection	$500	$500
Final report preparation	$2,500	$2,000
Final report technical edit and review	$1,000	$1,000
Subtotal	**$4,000**	**$3,500**
Total	**$26,300**	**$20,760**

D. Verification Sampling Results Table

See Table 3.2-1 for the verification sampling results.

E. Certificate of Completion

The signed Certificate of Completion is attached.

Certificate of Completion

I certify that all the work pertaining to the voluntary corrective action (VCA) conducted at PRS No. 35-014(f) has been completed in accordance with the Department of Energy approved VCA plan entitled *VCA Plan for PRS 35-014(f), Oil-Stained Soil and Concrete, Field Unit 4, Environmental Restoration Project, August 1996.* Based on my personal involvement or inquiry of the person or persons who managed this cleanup, a review of all data gathered, and a visit to the site, to the best of my knowledge and belief, all criteria of the plan have been met or exceeded. I believe that the completion of this VCA is protective to both human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Allyn Pratt

16 Sept 96

Allyn Pratt
Field Unit Four Project Leader
Environmental Restoration Project
Los Alamos National Laboratory

Date

F. Approval/Disapproval Form

The signed Voluntary Corrective Action (VCA) Completion Report Approval/Disapproval Form is attached.

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VOLUNTARY CORRECTIVE ACTION (VCA) COMPLETION REPORT
APPROVAL/DISAPPROVAL FORM

PRS 35-014(f)

The undersigned have reviewed the VCA Completion Report and believe that the intent and goals of the VCA plan have been met.

FPL _____ Date 17 Sept 96

FPC _____ Date _____

.....

I, Theodore J. Taylor, DOE-LAAO, **APPROVE** _____, **DISAPPROVE** _____ the accompanying Voluntary Correction Action Report for PRS 35-014(f), TA-35.

The following reasons reflect the decision for disapproval:

_____

_____

_____

_____

_____

_____

_____

Signed:_____ Date:_____

G. Waste Profile Forms

The approved waste profile forms are attached.

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LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 24698

Generator :	PRATT, ALLYN	MS :	J521	PH :	44308	Z#:	099718
WMC :	DAYMON, DEBA	MS :	M327	PH :	6621398	Z#:	117207
CSR :	WINCH, MARY JANE	MS :	J593	PH :	75905	Z#:	114734
Status :	ACTIVE	Activation Date :	19-AUG-96	Expiration Date:	19-AUG-97		
Group :	EMER	TA :	35	Bldg :	000000	Room:	0

RMMA : N/A
Waste Accumu : N/A
Method of Char : **KNOWLEDGE OF PROCESS (KOP)**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **NON-RADIOACTIVE**
ONE TIME GENERATION
Assoc Docum: N/A

Waste Category: **NOT APPLICABLE**

Waste Sources : **REMEDIATION**

Waste Matrix : **SOLID**

Matrix Type : **HOMOGENEOUS**

Waste/Proc Desc : THIS WASTE STREAM INCLUDES THE CONCRETE DEBRIS GENERATED DURING THE VCA AT PRS-35-014 (F) WHICH WAS NOT VISIBLY (INCLUDING FIELD SCREENING) CONTAMINATED BY LEAKING OIL-HANDLING EQUIPMENT. DURING THE COURSE OF THE VCA CONTAMINATED CONCRETE WILL BE SEGREGATED FROM THIS WASTE STREAM AND PROFILED AND DISPOSED SEPARATELY.

Ignitability : **NOT IGNITABLE**

Corrosivity : **NOT AQUEOUS**

Reactivity : **NON REACTIVE**

Boiling Point : **NOT APPLICABLE**

Toxicity Characteristic Metals : N/A

Toxicity Characteristic Organic Compounds: N/A

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
CONCRETE DEBRIS		**100**	**100**	**%**

Radiological Characteristics: N/A

Waste Water Contaminants: N/A

Additional Information: THE CONCRETE DEBRIS INCLUDED IN THIS WPF WILL COME FROM AREAS ON THE PAD THAT DID NOT CONTAIN OIL-HANDLING EQUIPMENT. THESE LOCATIONS WERE NOT ASSOCIATED WITH ANY SPILLS OR LEAKS. THE INTENT IS TO SEGREGATE THIS CONCRETE FROM THE KNOWN CONTAMINATED CONCRETE (PROFILED SEPARATELY) IN THE INTEREST OF WASTE MINIMIZATION AND SEND THIS CONCRETE TO THE LOS ALAMOS COUNTY LANDFILL AS MUNICIPAL REFUSE.

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category :	**Non-rad Waste**
RCRA Category :	**Non-hazardous Waste**
Misc. Category :	**MUNICIPAL REFUSE**
Waste Classification :	**MUNICIPAL REFUSE**
EPA Hazardous Waste Code :	N/A

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 24699

Generator :	PRATT, ALLYN	MS :	J521	PH :	44308	Z#:	099718
WMC :	DAYMON, DEBA	MS :	M327	PH :	6621398	Z#:	117207
CSR :	WINCH, MARY JANE	MS :	J593	PH :	75905	Z#:	114734
Status :	ACTIVE	Activation Date :	21-AUG-96	Expiration Date:	21-AUG-97		
Group :	EMER	TA :	35	Bldg :	000000	Room:	0

RMMA : N/A
Waste Accumu : N/A
Method of Char : **ANALYSIS ATTACHED**
KNOWLEDGE OF PROCESS (KOP)

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **NON-RADIOACTIVE**
ONE TIME GENERATION
Assoc Docum: N/A

Waste Category: **NOT APPLICABLE**

Waste Sources : **REMEDIATION**

Waste Matrix : **SOLID**

Matrix Type : **HETEROGENEOUS**

Waste/Proc Desc : THIS WASTESTREAM INLUDES CONCRETE DEBRIS AND SOIL GENERATED DURING THE VCA AT PRS 35-014 (F). THE CONCRETE DEBRIS IS STAINED FROM LEAKING OIL PIPELINES AND A LEAKING GENERATOR. THE SOIL HAS BEEN ANALYZED AND WAS FOUND TO BE CONTAMINATED WITH TPH. THIS WASTESTREAM WILL BE CHARACTERIZED BY RFI SITE CHARACTERIZATION SOIL ANALYTICAL RESULTS (DATA ATTACHED).

Ignitability : **NOT IGNITABLE**

Corrosivity : **NOT AQUEOUS**

Reactivity : **NON REACTIVE**

Boiling Point : **NOT APPLICABLE**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				**TOTA**
BARIUM		**37.8**	**124**	**PPM**	**TOTA**
CADMIUM		**0**	**1.2**	**PPM**	**TOTA**
CHROMIUM		**11.8**	**53.7**	**PPM**	**TOTA**
LEAD		**3.4**	**14.5**	**PPM**	**TOTA**
MERCURY	Y				
SILVER	Y				

Toxicity Characteristic Organic Compounds:

Contaminant	LTR	Min	Max	Unit	Method
TRICHLOROETHYLENE	Y				
PERCHLOROETHYLENE OR TETRACHLOROETHYLENE	Y				

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
SOIL		**95**	**99**	**%**
CONCRETE DEBRIS		**1**	**5**	**%**
TOTAL PETROLEUM HYDROCARBONS (TPH)		**0**	**12000**	**PPM**
BIS(2-ETHYL(HEXYL) PHTHALATE		**0**	**.75**	**PPM**
CIS-1,2-DICHLOROETHENE		**0**	**.003**	**PPM**
TOLUENE		**0**	**.006**	**PPM**
XYLENES (TOTAL)		**0**	**.003**	**PPM**

Radiological Characteristics : N/A

Waste Water Contaminants : N/A

Additional Information: THE EQUIPMENT/PROCESSES ASSOCIATED WITH THIS SITE INCLUDE AN INACTIVE (BUT OPERATIONAL) COMPRESSOR AND OIL-HANDLING PIPELINES ADJACENT TO TA-35-188 (HIGH VOLTAGE DEVELOPMENT LABORATORY). RFI SITE CHARACTERIZATION ANALYTICAL RESULTS SHOW TRACE AMOUNTS OF SOLVENTS, HOWEVER THE MAJORITY OF THE ORGANICS RESULTS ARE FLAGGED BY THE ANALYTICAL LABORATORY WITH THE DATA QUALIFIES "J", WHICH INDICATES THAT THE REPORTED CONCENTRATION IS AN ESTIMATE AND IS BELOW THE METHOD'S REQUIRED DETECTION LIMIT. KNOWLEDGE OF PROCESS INDICATES THAT THERE WAS NO SOLVENT USE AT THIS SITE; THIS WASTE DOES NOT MEET THE DEFINITION OF A LISTED WASTE. MOBILE RADIOLOGICAL (RADVAN) SCREENING DATA SHOWS SLIGHTLY ELEVATED RESULTS WHICH IS NOT CONFIRMED BY RADIOLOGICAL FIELD SCREENING. RADVAN COUNT TIMES WERE SAMLL AND UNCERTAINTIES HIGH (< 1/3 OF REPORTED RESULTS). NO RADIOLOGICAL OPERATIONS OR PROCESSES WERE CONDUCTED AT THIS SITE. FIELD SCREENING FOR BETA-GAMMA, ALPHA, AND GAMMA (NAI DETECTOR) INDICATES NO MEASUREMENTS ABOVE BACKGROUND LEVELS, SUPPORTING THE DETERMINATION OF NON-RADIOACTIVE WASTE. ANALYTICAL DATA FROM THE RFI SITE CHARACTERIZATION SAMPLES INDICATES THAT THE WASTE CONTAINS TPH ONLY AND MEETS THE DESCRIPTION OF NEW MEXICO SPECIAL WASTE.

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **Non-rad Waste**

RCRA Category : **Non-hazardous Waste**

Misc. Category : **NEW MEXICO SPECIAL WASTE**

Waste Classification : **NEW MEXICO SPECIAL WASTE**

EPA Hazardous Waste Code : N/A

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 24700

Generator :	PRATT, ALLYN	MS :	J521	PH :	44308	Z#:	099718
WMC :	DAYMON, DEBA	MS :	M327	PH :	6621398	Z#:	117207
CSR :	WINCH, MARY JANE	MS :	J593	PH :	75905	Z#:	114734
Status :	ACTIVE	Activation Date :	21-AUG-96	Expiration Date:			21-AUG-97
Group :	EMER	TA :	35	Bldg :	000000	Room:	0

RMMA : N/A
Waste Accumu : N/A
Method of Char : **ANALYSIS ATTACHED**
KNOWLEDGE OF PROCESS (KOP)

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **NON-RADIOACTIVE**
ONE TIME GENERATION
Assoc Docum: N/A

Waste Category: **NOT APPLICABLE**

Waste Sources : **REMEDIATION**

Waste Matrix : **SOLID**

Matrix Type : **HETEROGENEOUS**

Waste/Proc Desc : THIS WASTESTREAM CONSISTS OF PPE (PAPER COVERALLS, NITRILE GLOVES) AND DRY DECONTAMINATION MATERIALS (PAPER/CLOTH TOWELS/DECON RESIDUE) GENERATED DURING THE VCA AT PRS 35-014 (F). THIS WASTESTREAM WILL BE CHARACTERIZED BY RFI SITE CHARACTERIZATION SOIL ANALYTICAL RESULTS (DATA ATTACHED). THE DATA PRESENTED IN THIS PROFILE REPRESENT CONCENTRATIONS FOUND IN SOIL THAT WILL COME IN CONTACT WITH THIS. (PPE/DRY DECON) WASTESTREAM.

Ignitability : **NOT IGNITABLE**

Corrosivity : **NOT AQUEOUS**

Reactivity : **NON REACTIVE**

Boiling Point : **NOT APPLICABLE**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				**TOTA**
BARIUM		**37.8**	**124**	**PPM**	**TOTA**
CADMIUM		**0**	**1.2**	**PPM**	**TOTA**
CHROMIUM		**11.8**	**53.7**	**PPM**	**TOTA**
LEAD		**3.4**	**14.5**	**PPM**	**TOTA**
MERCURY	Y				**TOTA**
SILVER	Y				**TOTA**

Toxicity Characteristic Organic Compounds:

Contaminant	LTR	Min	Max	Unit	Method
PERCHLOROETHYLENE OR TETRACHLOROETHYLENE	Y				**TOTA**
TRICHLOROETHYLENE	Y				**TOTA**

Additional Chemical Constituents and Contaminants :

Constituent	CAS NO	MIN	MAX	UOM
PPE, PAPER TOWELS		**99**	**100**	**%**
SOIL		**0**	**1**	**%**
TOTAL PETROLEUM HYDROCARBONS (TPH)		**0**	**12000**	**PPM**
BIS (2-ETHYL(HEXYL) PHTHALATE		**0**	**.75**	**PPM**
CIS-1,2-DICHLOROETHENE		**0**	**.003**	**PPM**
TOLUENE		**0**	**.006**	**PPM**
XYLENES (TOTAL)		**0**	**.003**	**PPM**

Radiological Characteristics: N/A

Waste Water Contaminants: N/A

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EPA Hazardous Waste Code : N/A