Los Alamos National Laboratory

UNIVERSITY OF CALIFORNIA

Environmental Restoration

Environmental Restoration Project
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Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

Date: June 3, 1996
Refer to: EM/ER:96-317

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Mr. Ted Taylor
Los Alamos Area Office
US Department of Energy, MS A316
Los Alamos, NM 87544

SUBJECT: FINAL VOLUNTARY CORRECTIVE ACTION (VCA) PLAN FOR ACTIVITIES AT TECHNICAL AREA (TA) 35, POTENTIAL RELEASE SITE (PRS) 35-018(a)

Dear Ted:

Enclosed for your records please find a copy of the final VCA Plan for activities in TA-35, PRS 35-018(a). This activity is planned for completion in Fiscal Year 1996.

Your Field Project Coordinator participated in developing and reviewing this plan. The VCA Checklist and Field Authorization Form have been completed and signed and are included in the enclosed plan.

Informational copies of this VCA Plan are being distributed to the regulators.

If you have any questions, please call Allyn Pratt at (505) 667-4308 or Bob Simeone at (505) 667-0587. Thank you for your cooperation in this matter.

Sincerely,

Jorg Jansen
Program Manager

JJ/bp

Enclosures: Final VCA Plan for TA-35, PRS 35-018(a)
VCA Checklist and Field Work Authorization Form

5231

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Voluntary Corrective Action Plan for

Potential Release Site 35-018(a)

Electrical Transformer Substation

Field Unit 4

Environmental Restoration Project

June 1996

A Department of Energy
Environmental Cleanup Program

JUN 20 1996

Los Alamos
NATIONAL LABORATORY

LA-UR-96-1992

1.0 INTRODUCTION

This document describes the voluntary corrective action (VCA) plan for Potential Release Site (PRS) No. 35-018(a), which is located within Los Alamos National Laboratory (the Laboratory) Technical Area (TA) -35 on Ten Site Mesa. This PRS has been selected for VCA because the remedy is obvious, is easily implemented, and will prevent potential future environmental hazards associated with oil-stained soil that is contaminated with polychlorinated biphenyls (PCBs) and semivolatile organic compounds (SVOCs).

PRS No. 34-018(a) is not listed in the Resource Conservation And Recovery Act (RCRA) Hazardous and Solid Waste Amendments permit (EPA 1990, 1585). A RCRA facility investigation (RFI) was performed for this PRS in 1995. The PRS is being recommended for VCA in the RFI report for TA-35 (hereafter referred to as the RFI report), which is currently being prepared, because the RFI indicated that soils contaminated with PCBs, SVOCs, petroleum hydrocarbons, and possibly pesticides are present in a relatively small area.

1.1 Site Type and Description

PRS No. 35-018(a) is the site of an electrical transformer substation (TA-35-32), which has leaked dielectric oil that contains PCBs. The site is located near the southwest corner of building TA-35-29 (Figure 1.1-1). Investigations of the site have determined that it is not located in a water course (Jacobson 1996, 54195).

The PRS, associated with former Operable Unit 1129, is managed by Field Unit 4 of the Laboratory Environmental Restoration (ER) Project.

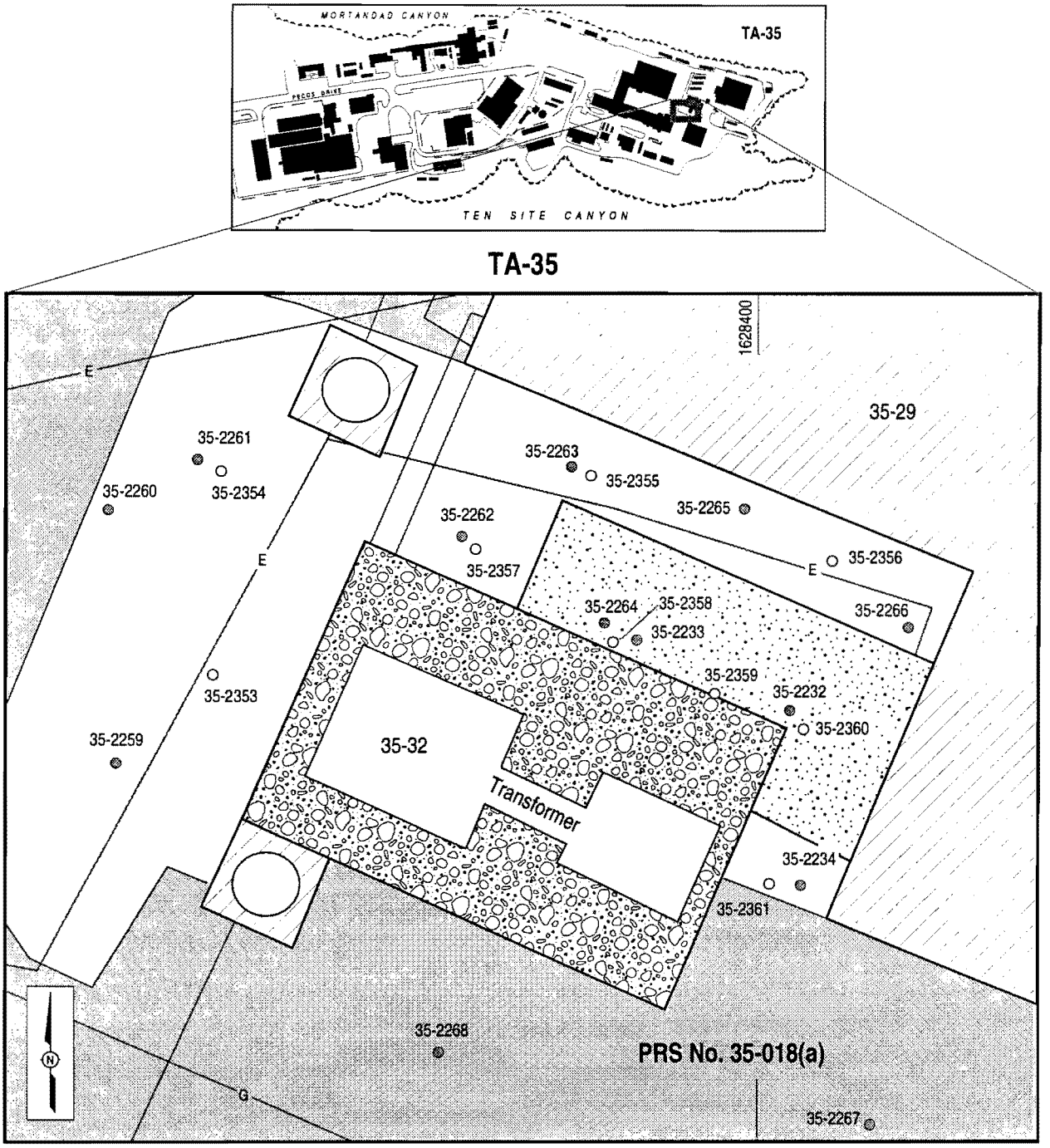
1.1.1 Operational History

PRS No. 35-018(a) is described in Section 3.3.2 of the *RFI Work Plan for Operable Unit 1129* (the work plan) (LANL 1992, 7666).

TA-35-32 was installed in 1961 and is still operating. The transformer (PCB ID No. 5024) formerly contained oil with PCB concentrations greater than 500 parts per million. During a survey of the transformer in 1985, it was reported that the transformer was dripping coolant fluid onto a concrete pad that had no spill containment and no drip pan (LANL 1990, 7511). During a subsequent site inspection in August 1991, no evidence of past or present leakage was observed (Roberson 1991, 21578). The PCB-containing dielectric oil coolant was removed from the transformer in 1994, and the equipment was replaced with a non-PCB-containing coolant. During the RFI, site inspections did not find oil staining on the concrete pad, although some oil-stained soil was located adjacent to the pad.

1.1.2 Chemicals of Potential Concern and Rationale for Proposed Remedial Action

The RFI confirmed the presence of PCBs above the Laboratory screening action level (SAL) of 1 mg/kg. The soil samples were also analyzed for volatile organic compounds (VOCs), SVOCs, metals, and gross-alpha, -beta, and -gamma radiation. Some soil samples were analyzed for total petroleum hydrocarbons (TPH), and one sample was analyzed for pesticides. The pesticide Dieldrin was detected at levels that are approximately 10 times the SAL value. Thirteen samples also contained SVOCs (polycyclic aromatic hydrocarbons [PAHs]) above Laboratory SAL values. For all samples analyzed, the results of VOC analyses were nondetect, and the results of metal analyses were below SAL values. The results of the gross radiation measurements were not significantly above background levels.



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	Building or structure location	○	Planned verification sample location
	Transformer concrete pad	—E—	Power line
	Cleanup area	—G—	Gas line
●	Phase I sample location		Paved area

Figure 1.1-1. Site map of PRS No. 35-018(a) showing area to be cleaned up and planned locations of verification samples.

PCBs and PAHs exist in soil surrounding the electrical transformer in concentrations that are up to approximately 150 times SAL values. The chemicals of potential concern (COPCs) are known, and the nature and approximate extent of contamination are thought to be known. Because of the relatively small volume of contaminated soil, an obvious remedy is to remove that soil.

2.0 SITE CHARACTERIZATION

2.1 RFI Information and Other Decision Data

The RFI was performed in 1995 according to the sampling and analysis plan (SAP), which is described in Section 7.26 of the June 1994 addendum to the work plan (Pratt 1994, 43475). The RFI consisted of a health and safety (H&S) radiation survey, an engineering survey, environmental surveys including a radiation grid survey, two 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/gam-ma 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 organic vapors were detected.

The H&S radiation survey was performed on September 14, 1994. No beta/gamma radiation measurements above background levels were detected. The engineering survey was performed on September 14, 1994. The survey consisted primarily of identifying and documenting the location and condition of the PRS before beginning sampling activities. Based on the results of the engineering survey, the sample locations for the PRS were selected on March 27, 1995. The radiation grid survey was performed on September 29, 1994. A total of 59 grid points were located at approximately 5-ft intervals. The radiation measurements ranged from 121 to 294 cpm beta/gamma radiation with a mean value of 220 cpm. No beta/gamma radiation measurements above background levels were recorded an any of the grid points.

Phase I sampling was performed on April 19, 1995. Seven soil samples were collected from three sites (Location ID Nos. 35-2232, 35-2233, and 35-2234) including one surface sample from Location ID No. 35-2232 and three subsurface samples from two hand-auger holes (Location ID Nos. 35-2233 and 35-2234). The subsurface soil samples were collected from the following intervals: 0 to 1 ft, 1 to 2 ft, and 2 to 3 ft. Figure 1.1-1 shows the RFI sample locations. These samples were analyzed for PCBs, VOCs, SVOCs, and metals by the mobile laboratory facility using modified Environmental Protection Agency (EPA) SW-846 methods for the organic constituents (EPA 1986, 31733) and XRF for metals analysis. Two confirmatory samples were collected for analysis at a fixed-site laboratory.

Supplemental samples were collected on October 7, 1995. A total of 28 samples were collected from 10 hand-auger holes. At each of 8 hand-auger holes, 3 samples were collected from the following intervals: 0 to 1 ft, 1 to 2 ft, and 2 to 3 ft. At each of 2 hand-auger holes, 2 samples were collected only from the 0 to 1-ft and 1- to 2-ft intervals because the hand auger was unable to advance beyond the 2-ft depth because of unknown obstructions. The supplemental sample locations include Location ID Nos. 35-2259 through 35-2268. These samples were analyzed for PCBs, VOCs, SVOCs, TPH, and metals by the mobile laboratory facility using modified EPA SW-846 methods for the organic constituents (EPA 1986, 31733) and XRF for metals analysis.

A summary of the analytical results above SAL values is provided in Annex 7.2 of this VCA plan. The analytical results show that PCB- and SVOC-contaminated soils are present, but radioactivity is not present significantly above background levels. No VOCs were detected in any of the samples.

2.2 Nature and Extent of Contamination

PCB contamination above the 1 mg/kg SAL was detected at eight sample sites. PCB contamination is confined to surface samples at five of the eight sites. Two sites (Location ID Nos. 35-2233 and 35-2262) contain PCB contamination above 1 mg/kg at the 0 to 1-ft and 1- to 2-ft intervals. PCB contamination above 1 mg/kg was detected at the 2- to 3-ft interval only at Location ID No. 35-2265. Table 7.2-1 contains the PCB results above the SAL value, and Figure 2.2-1 shows the PCB concentrations at each sample location. Three sites (Location ID Nos. 35-2232, 35-2233, and 35-2264) measured PCB contamination greater than 10 mg/kg. PCB contamination greater than 10 mg/kg was not measured below the 0 to1-ft interval at any site. The area around these three sites encompasses about 160 ft^2.

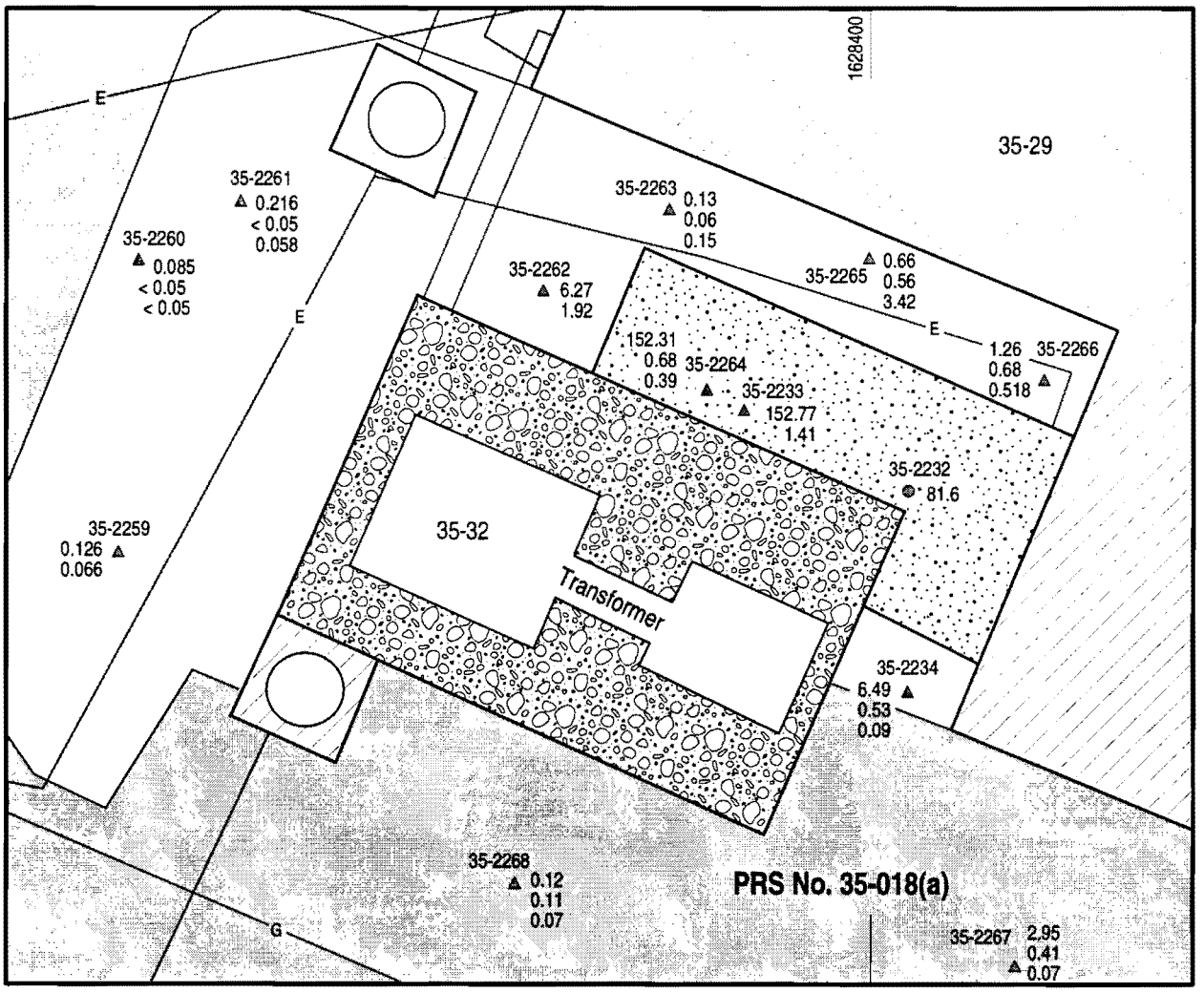
SVOC contamination above SAL values was found at eight sample locations (Location ID Nos. 35-2232, 35-2260, 35-2261, 35-2262, 35-2263, 35-2264, 35-2265, and 35-2266). The SVOC contamination is primarily PAHs: benzo[a]pyrene, dibenzo[a,h]anthracene, benzo[a]anthracene, benzo[b]fluoranthene, and indeno[1,2,3-cd]pyrene. The concentrations of the PAHs in the soil samples are shown in Table 7.2-2 and Figure 2.2-2 and generally range from 3 to 7 mg/kg. Table 7.2-2 also shows the SAL value for each PAH. Because the cleanup levels for the PAHs (which are derived in Section 3.2) are higher than the observed PAH contamination levels at the site, PAH contamination is not expected to drive the cleanup. Verification samples will be analyzed for SVOCs to confirm that PAHs are not present at the site above site-specific risk-based concentrations.

The pesticide Dieldrin was detected above the SAL value of 0.028 mg/kg in one sample at Location ID No. 35-2232 (0.269 mg/kg). Because the cleanup level for Dieldrin (which is derived in Section 3.2) is higher than the contamination level at the site, Dieldrin is not expected to drive the cleanup. Verification samples will also be analyzed for pesticides to confirm that Dieldrin is not present at the site above risk-based concentrations.

Petroleum hydrocarbons in the C_{10} to C_{20} range were detected in samples from two initial sampling sites: Location ID Nos. 35-2233 (0 to 1 ft) and 35-2234 (1 to 2 ft). Specific concentration values for the petroleum hydrocarbons were not reported. The supplemental samples were analyzed for TPH, which was detected in most samples and ranged up to a maximum value of 1,020 mg/kg at Location ID No. 35-2264 (0 to1 ft). Table 7.2-4 contains the TPH results from the RFI sampling. Because PCBs were carried in an oil-based coolant, TPH could be present at the site.

Metals including chromium, copper, lead, uranium, and zinc were measured above background levels in several samples. However, no metal concentrations above SAL values were detected. Verification samples will be analyzed for metals to confirm that metals are not present at concentrations that pose a potential health risk.

When the transformer was reported dripping coolant fluid in 1985, the leak was summarized as an "active leak requiring drip pan; no spill containment; located on porous concrete pad" (LANL 1990, 7511). During the RFI the concrete pad was inspected to determine if PCB-contaminated oil could have leaked through. The concrete pad was found to be a normal, aggregate type cement that had been finished with a trowel and float to a smooth surface. One small concrete patch was present on the north side of the pad, but no cracks or weathered cement were found. Fluids leaking onto the concrete pad would be expected to flow



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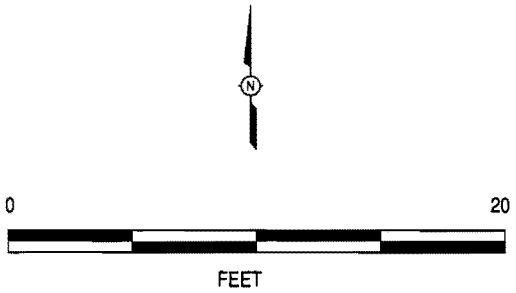

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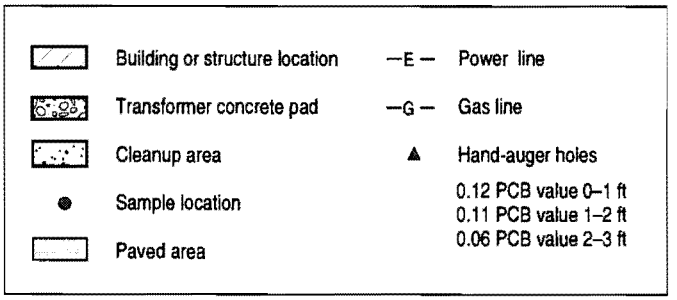
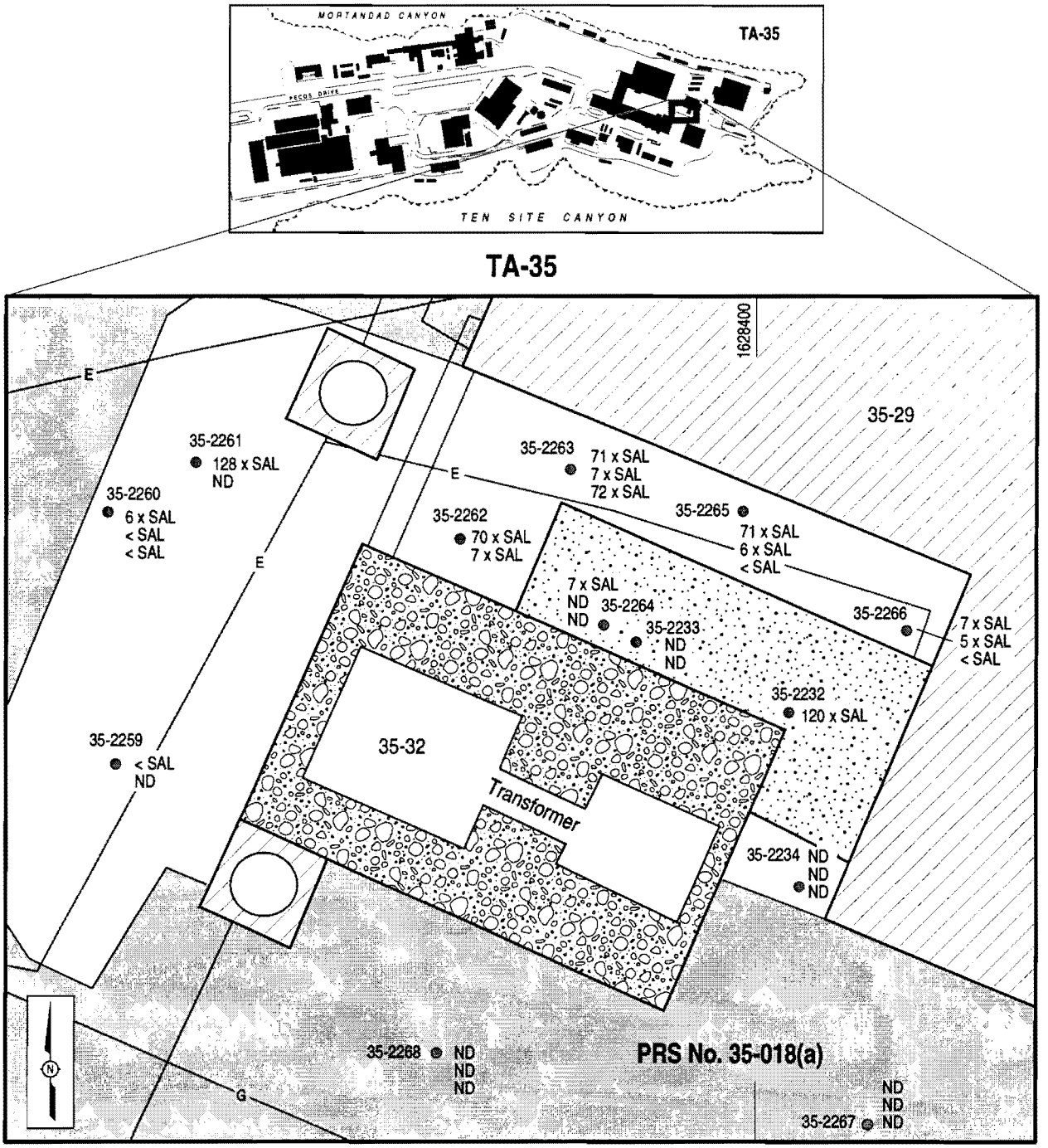


Figure 2.2-1. PCB concentrations (mg/kg) in samples at PRS No. 35-018(a).



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Building or structure location

Transformer concrete pad

Cleanup area

Phase I Sample location

Paved area

—E— Power line

—G— Gas line

Maximum PAH concentration/SAL

71 x SAL = PAH value ÷ SAL 0–1 ft

< SAL = PAH value < SAL 1–2 ft

ND = nondetect 2–3 ft

Figure 2.2-2. Maximum PAH levels detected at PRS No. 35-018(a).

toward the edge of the pad. At the time of the RFI, no sign of oil staining was present on the concrete pad that would indicate that fluids had infiltrated the concrete. Therefore, confirmatory samples will be located in the soil adjacent to the concrete pad.

3.0 PROPOSED REMEDY

3.1 Description of the Proposed Remedial Action

A phased approach for removing the contaminated soil will be implemented for the VCA, as required by the results of the RFI sampling. Each phase of soil removal will consist of the excavation of soil to an appropriate depth, depending on the extent of contamination at the site. It is anticipated that an excavation depth of 6 in. to 1 ft (referred to as a "lift of soil") will be removed, followed by field screening and possible soil sample collection and analysis. Field screening and soil sample analyses for the identified COPCs will be used to guide the removal of additional contaminated soil. If field screening and/or analytical results indicate that contamination is present after excavating a lift of soil, then another phase of excavation, field screening, sample collection, and sample analysis will be performed. This process will continue until contamination is no longer detected above the cleanup levels or until the excavation reaches a depth of 3 ft.

The remedial action may proceed up to a maximum depth of 3 ft below the original ground surface. If contamination is found to exist at depths greater than 3 ft, the VCA will be halted in accordance with the ER Project "Stop Work" criteria (LANL 1996, 52950), and the requirements of the VCA plan will be reassessed.

Contaminated soil will be excavated using hand-operated shovels and buckets, and where appropriate, mechanical assistance using a bobcat loader and/or a backhoe. The contaminated materials will be placed in lined 55-gal. drums or a roll-off container for disposal at an approved waste disposal facility. During the VCA activities, the storm water and surface water flow will be prevented from entering and leaving the site by engineering controls such as soil berms and/or silt fences.

Final verification soil samples will be collected in areas where contaminated soil was removed on the basis of initial sampling and when field screening of each area shows that no contamination is present. The requirements for the verification samples are discussed in Section 5.0.

3.2 Basis for Cleanup Levels

PRS 35-018(a) is located on Department of Energy (DOE) -owned land on a mesa top. The land is anticipated to be used exclusively for Laboratory (industrial) operations in the foreseeable future (LANL 1994, 1171).

In addition to on-site human health concerns, contamination that remains following VCA activities may require evaluation for potential impact to ground and/or surface water. The need for such evaluation is likely to be influenced by the nature and extent of any remaining contamination as well as site-specific hydrogeological characteristics. A discussion of the migration potential of any remaining contamination will be presented in the VCA report for PRS No. 35-018(a).

The cleanup levels calculated in this VCA plan are based on human health risks using an industrial land use exposure scenario. The equations and parameter values used in the calculations are identical to those specified in the EPA Region IX preliminary remediation goal (PRG) tables for industrial land use (EPA 1995, 53970) with the following two exceptions: (1) on-site soil is assumed to account for only 10% of the soil to which a receptor is exposed daily and (2) the target lifetime incremental risk value for carcinogens has been set at 1 in 100,000. The cleanup values incorporate exposure via soil ingestion, inhalation of dust or organic vapors, and dermal absorption routes of exposure.

On-site soil was assumed to represent only 10% of all soil ingested, inhaled, or exposed to the skin because it is highly unrealistic that all daily soil exposure will repeatedly occur in the small area of contaminated soil addressed in this VCA plan (see Figure 1.1-1). The value of 10% is based on best professional judgment and is intended to provide a reasonable maximum exposure estimate.

The target value for lifetime incremental cancer risk was increased from the value of 1 in 1,000,000 used in the EPA Region IX PRG table (EPA 1995, 53970) to 1 in 100,000. The chosen value lies at the midpoint of the EPA target risk range of 10^{-6} to 10^{-4}. A value above the lower end of the risk range is an appropriate choice at this site because the population exposed under an industrial land use scenario is restricted to a relatively small number of workers who may perform intrusive work or maintenance activities in the area.

The cleanup levels calculated for this site are presented in Table 3.2-1. If two or more of these carcinogenic chemicals are present in verification samples, additive effects will be assumed by normalizing chemical-specific data to each cleanup level in a manner similar to that described for the multiple chemical evaluation in *Risk-Based Corrective Action Process* (ER Decision Support Council 1996, 53751).

TABLE 3.2-1

CLEANUP LEVELS FOR COPCs

COPC	Cleanup Levels (mg/kg)
PCBs	10[a]
Benzo[a]anthracene	260
Benzo[b]fluoranthene	260
Benzo[a]pyrene	26
Benzo[k]fluoranthene	2,600
Dibenzo[a,h]anthracene	26
Indeno[1,2,3-cd]pyrene	260
Dieldrin	12

a. Although the risk-based cleanup level actually calculated for PCBs is 34 mg/kg, the effective cleanup level that will be implemented at this site is 10 mg/kg. A more restrictive cleanup level than the calculated value is proposed because existing data indicate that it can be easily achieved.

Chemicals identified as COPCs were measured in one or more samples at concentrations exceeding their respective SAL values. Other SVOCs were also identified but at concentrations below SAL values. These other SVOCs, except chrysene, are noncarcinogenic chemicals. Because these SVOCs may also be detected in verification samples, cleanup levels are provided in Table 3.2-2. A lifetime incremental cancer risk of 1 in 100,000 is used to calculate the cleanup value for chrysene, and a hazard quotient of 1 is used to calculate cleanup values for the noncarcinogenic SVOCs. The cleanup values for acenaphthene, anthracene, fluorene, and naphthalene are not risk-based values but rather concentrations at which soil organic carbon, pore water, and air phases would be saturated with these particular chemicals. As described by EPA (1995, 53970), these chemicals are defined as VOCs rather than SVOCs on the basis of their molecular weight and Henry's constants. The EPA model used to calculate ambient air concentrations associated with VOCs in soil is invalid when soil concentrations exceed the soil saturation limit. Actual risk-based concentrations for these chemicals would be higher than the soil saturation limit provided in Table 3.2-2 and may be calculated with an appropriate model if residual concentrations observed in verification samples warrant the additional effort.

TABLE 3.2-2

CLEANUP LEVELS FOR SVOCs DETECTED AT CONCENTRATIONS BELOW SAL VALUES

SVOC	Cleanup Levels (mg/kg)
Acenaphthene	360
Anthracene	19
Chrysene	26,000
Dibenzofuran	27,000
Fluoranthene	270,000
Fluorene	300
Naphthalene	800
Pyrene	200,000

3.3 Site Restoration

When sample results confirm that the site has been remediated in accordance with this VCA plan, the excavated area will be returned to the original grade and revegetated according to Laboratory requirements. The site will be backfilled with clean soil fill material obtained from the Laboratory's maintenance contractor, Johnson Controls World Services, Inc.

Table 3.3-1 shows the standard seed mix that is recommended by Laboratory Group FSS-8.

TABLE 3.3-1

STANDARD SEED MIX

Percentage	Type
3–7%	Dropseed
8–12%	Galleta grass
6–10%	Alkali sacaton
10–14%	Sideoats grama
13–17%	Indian ricegrass
18–22%	Sheep fescue
8–12%	Blue grama
18–22%	Western wheatgrass

4.0 WASTE MANAGEMENT

4.1 Estimated Types and Volumes of Waste

PCB-contaminated soil will be the primary waste material generated at the site. The transformer contained PCBs above 500 ppm; therefore, the antidilution rule of 40 CFR 761.1(b) applies. All associated PCB-contaminated waste will be treated as if it contains 500 ppm or greater of PCBs. SVOCs (PAHs) are a secondary contaminant at the site. However, because no documented process or source is associated with

these contaminants, the waste does not meet the definition of a listed waste and is not subject to regulation by RCRA. Care will be taken during the remediation process to segregate soil and other waste that contains PCBs from non-PCB waste. Incidental waste from the remedial action will include personnel protective equipment (PPE), such as viton gloves, tyvek coveralls, and decontamination process wastes (deionized water). PCB-contaminated soil will be disposed of as directed by the Toxic Substances Control Act (TSCA) and Laboratory administrative requirement (AR) 10-4, "Polychlorinated Biphenyls." The approved Waste Characterization Strategy Form is attached to this VCA plan (see Section 7.6). Table 4.1-1 lists the estimated types and volumes of waste that will be generated during VCA activities.

TABLE 4.1-1

ESTIMATED WASTE

Item	Waste Type	Anticipated Volume
Personal protective equipment	Solid	1 55-gal. drum
PCB-contaminated soil	Solid	6 yd^3 in 55-gal. drums or a roll-off container
Decontamination waste	Solid	2 55-gal. drums

4.2 Method of Management and Disposal

Nonradioactive soil that is contaminated with PCBs must be disposed of off-site at an EPA approved incineration facility. This PCB waste will be packaged in metal drums or roll-off containers that meet or exceed Department of Transportation (DOT) Specification 17C. Before the waste is transported off-site, the drums will be labeled, stored in an area designated for waste management, and properly managed.

Radioactively contaminated waste is not expected; however, any radioactive- and PCB-contaminated waste will be disposed of at TA-54, Area G. Mixed waste will be disposed of as directed by AR 10-3, "Hazardous and Mixed Waste."

5.0 SAMPLING AND ANALYSIS PLAN

5.1 Problem Definition

The following concerns will be addressed by measurements taken during the execution of this SAP.

- As the cleanup progresses, what areas have been adequately cleaned up, and what areas require additional excavation to remove contaminated material?
- At the completion of the VCA activities, have the activities met the requirements of the cleanup criteria?

5.1.1 Purpose

The purpose of this plan is to provide a framework of sampling and analysis protocol to guide the cleanup activities and to confirm the performance of the VCA activities according to the site cleanup criteria.

5.1.2 Regulatory Drivers

Remediation and waste disposal will proceed according to TSCA regulations. Sample collection and analysis will follow EPA regulations and protocol (40 CFR §761.130).

5.2 SAP Design

5.2.1 Preliminary Observations

Preliminary site observations will be performed before conducting VCA activities. These observations will include the following activities.

- Visual inspection and documentation of areas of visible oil staining relative to the existing buildings and structures
- Mark-outs of buried utilities to delineate the location of electrical, gas, and water lines
- Delineation of the area to be cleaned up
- Identification of the RFI sample locations relative to adjacent structures and on the site map to maintain location control during the cleanup activities

These observations will be used to locate verification samples as the cleanup progresses.

5.2.2 Identification of Chemicals of Potential Concern and Evaluation of Field Screening Methods

PCBs, PAHs, and Dieldrin are the COPCs associated with this cleanup. Field screening of each sample will include the use of the following equipment.

- Hand-held beta/gamma instrument
- Organic vapor analyzer instrument
- Mobile radiological van screening for DOT purposes, including gross-alpha, -beta, and -gamma radiation
- PCB field test kit (DTECH or equivalent)

During RFI sampling, the PCB field test kit was used to analyze 10 soil samples from PRS No. 35-018(a) to evaluate the field screening results compared with XRF results from the mobile laboratory facility. The results of the comparison of this limited data set suggest that the field test kit provides conservative results up to a concentration value of about 10 mg/kg, but limited data values were available for samples with concentrations greater than 10 mg/kg. Therefore, if the results of the field test kits show values greater than 10 mg/kg, additional excavation should be performed before collecting samples for verification purposes.

5.2.3 Confirmation and Verification Sampling

The first phase of confirmation sampling will consist of the collection of grab and/or composite soil samples in the areas where excavation of contaminated materials has been performed. The confirmation samples will be analyzed on-site for PCBs using field techniques. The field test analysis will be performed using DTECH PCB soil screening field test kits if these methods prove to be appropriate for guiding the VCA activities. If these field test kits do not provide adequate analytical results, field screening for PCBs will be performed by the mobile laboratory facility. Before the VCA activities commence, the field team leader will determine the method of field screening to be used by testing the field test kits on test samples collected at the sites of the previous RFI sampling. Based on the results of the field screening, contaminated material will be removed until screening results at the remaining surfaces are below the cleanup levels in any sector.

After the results of the confirmation samples indicate that a sector has been remediated to below the cleanup level, grab soil samples will be collected for verification of the field screening results in accordance with TSCA regulations (40 CFR §761.130). At least nine verification samples will be collected; three samples will be collected from known PCB-contaminated sites as shown by the RFI sampling results, and at least six additional samples will be collected from the perimeter of the remediated area. These verification samples will be analyzed at a fixed-site laboratory for PCBs; pesticides; SVOCs; metals; gross-alpha, -beta, and -gamma radiation; and gamma spectroscopy using SW-846 analytical methods (EPA 1986, 31733). The results of the verification samples will be used to determine if the cleanup levels were achieved and if the VCA was appropriately completed. If the verification sample results indicate that cleanup levels were not achieved, further excavation will continue in phases as described in Section 3.1.

5.2.4 Assumptions and Data Quality Requirements

Implementation of the VCA depends on the assumption that the Phase I RFI adequately defined the extent of contamination and that field test screening and field screening methods will be adequate to direct soil excavation at contaminated areas.

During the VCA activities, field analytical methods will be used to guide the cleanup. The cleanup will be verified using EPA SW-846 analytical procedures (EPA 1986, 31733) at a fixed-site laboratory. The collection of verification soil samples will be performed in accordance with the ER Project *Quality Assurance Project Plan Requirements for Sampling and Analysis* (QAPP) (LANL 1996, 53450).

5.3 SAP Implementation

5.3.1 Field Methods

5.3.1.1 Preliminary Health and Safety Survey

An H&S survey of the site will be conducted by the site safety officer. No personnel will be allowed to enter the site until it has been surveyed for H&S issues. The site will be monitored for alpha and beta/gamma radiation and for safety hazards, slips, trips, falls, and weather conditions according to the site-specific health and safety plan (SSHASP). The results of the H&S survey will be documented by the site safety officer on the ESH-1 Direct Survey Results Form and by the field team leader (FTL) in the Daily Activity Log.

5.3.1.2 Engineering Surveys

Engineering surveys of the site will be performed to document the activities and to establish the site conditions during and after sampling activities. The engineering surveys will include establishing and marking the sectors to be remediated and establishing the verification "hot spot" sampling locations before excavation. A grid will be established at the sectors to determine the locations of confirmation samples. The site will be inspected as remediation and sampling progresses, and photographic and narrative documentation of morphologic features will also be performed. The engineering surveys will be documented by the FTL in the Daily Activity Logs.

5.3.1.3 Field Sampling

Confirmation soil samples will be collected after the first 6 in. of soil have been excavated from the site. The sample collection locations will be described numerically and documented in Daily Activity Logs. The actual sample locations and sampling conditions will be described and documented on the Sample Collection Log. Spade and scoop methods will be used to collect the samples, and the method will be documented on the Sample Collection Log. The confirmation grid sampling will include the RFI sample locations that contained PCBs. Confirmation soil samples will be analyzed for PCBs in the field using screening methods (the DTECH PCB soil screening field test kit) and possibly by the mobile laboratory facility. If samples are sent to the mobile laboratory facility, the samples will also be analyzed by the mobile radiological van for gross-alpha, -beta, and -gamma radiation.

If additional soil excavation and removal is indicated by the results of confirmation sampling after the first 6 in. of soil has been removed, additional soil will be removed in 6-in. lifts at the sites indicated to be contaminated. After additional soil removal is completed, additional confirmation soil samples will be collected at the sites previously shown to contain contamination, and the samples will be analyzed in the same manner as the previous confirmation samples. This procedure of excavation and confirmation soil sampling will continue until all confirmation soil samples are below the cleanup level for PCBs, PAHs, and Dieldrin.

After the confirmation soil samples show that all sectors at the site are below cleanup levels, grab verification soil samples will be collected at the sample locations that originally contained PCBs above the cleanup level. Three verification soil samples will be collected at the following RFI locations: Location ID Nos. 35-2232, 35-2233, and 35-2264. Six samples will be collected around the perimeter of the cleanup area to confirm that COPCs are not present above cleanup levels. Table 5.3.1-1 and Figure 1.1-1 show the verification samples to be collected. The verification samples will be analyzed by the mobile radiological van for gross-alpha, -beta, and -gamma radiation (for DOT purposes) and will be sent to a fixed-site laboratory for gamma spectroscopy and SW-846-equivalent PCB, pesticide, SVOC, and metals analyses. Quick turnaround time (less than two weeks) will be requested for the laboratory analyses .

5.3.1.4 Quality Assessment/Quality Control Samples

Quality assessment/quality control (QA/QC) samples will be selected based on the process described in the ER Project QAPP (LANL 1996, 53450). As indicated in Table 5.3.1-1, one blind duplicate field sample will be collected and analyzed for PCBs. All QA/QC samples that are collected will be documented daily by the FTL in the Sample Collection Log and the Daily Activity Log.

TABLE 5.3.1-1

VERIFICATION SOIL SAMPLES TO BE COLLECTED

Planned Sampling Date	Location ID No.	Depth (ft)	PRS No.	Gross -α, -β, -γ	γ Spec	SVOCs[a]	Metals by SW-846	Pest./ PCBs
Initial samples								
06/04/96	35-2353	0–0.5	35-018(a)	1	1	1	1	1
06/04/96	35-2354	0–0.5	35-018(a)	1		1		1
06/04/96	35-2355	0–0.5	35-018(a)	1	1	1	1	1
06/04/96	35-2356	0–0.5	35-018(a)	1		1		1
06/04/96	35-2357	0–0.5	35-018(a)	1	1	1	1	1
06/04/96	35-2358	0–0.5	35-018(a)	1		1		1
06/04/96	35-2359	0–0.5	35-018(a)	1	1	1	1	1
06/04/96	35-2360	0–0.5	35-018(a)	1		1		1
06/04/96	35-2361	0–0.5	35-018(a)	1	1	1	1	1
Supplemental samples (if needed)								
06/10/96	V35-xxxx	0–0.5	35-018(a)	1		TBD[b]	TBD	TBD
06/10/96	V35-xxxx	0–0.5	35-018(a)	1		TBD	TBD	TBD
Equipment rinsate blank						1		1

a. Gel permeation chromatography cleanup will be requested for all organic analyses.
b. TBD = to be determined

5.3.1.5 Field Survey of Sample Locations

The final verification sample locations will be documented and surveyed by professional surveyors after sampling is complete. The sample locations will be described relative to existing buildings and other features associated with the sample. The FTL will document the location and description of the sample sites in Daily Activity Logs.

5.3.2 Field Decisions

The layout of the remediation sectors and the confirmation sampling grid will be located on a field site map and attached to the Daily Activity Log.

This SAP requires the following field decisions.

- Are confirmation sample locations adequate to ensure successful remediation of the site?
- Are confirmation sample field analytical methods adequate for the intended purpose?
- Is the verification sampling plan appropriate for verifying the effectiveness of the VCA?

The FTL will document in the Daily Activity Log any deviation(s) from the SAP and the conditions that compel the deviation(s). Significant deviations from the SAP will be documented in a memorandum to the Field Unit 4 file.

5.3.3 Measurement Methods

The verification soil samples will undergo analysis for PCBs, pesticides, SVOCs, and metals at an ER Project-approved fixed-site laboratory. The target analytes and estimated quantitation limits are listed in Tables 5.3.3-1 and 5.3.3-2. Gel permeation chromatography cleanup will be requested for all organic analyses. All analyses will be performed according to EPA SW-846 protocols (EPA 1986, 31733). The required quality control procedures and the acceptance criteria for the PCB and SVOC analyses are found in the ER Project analytical services statement of work (LANL 1995, 49738).

TABLE 5.3.3-1

ANALYTE SUITES AND ANALYTICAL METHODS FOR ANALYSIS OF ORGANIC AND INORGANIC CONSTITUENTS IN SOIL SAMPLES[a]

Analyte Suite	Analytical Method	Analytical Protocol
Organic constituents		
Pesticide/PCBs	GC/ECD[b]	SW-8081
SVOCs	GC/MS[c]	SW-8270
Inorganic constituents		
Trace metals	ICPES[d]	SW-6010
As, Pb, Sb, Se, Tl	ICPMS[e] or GFAA[f]	SW-6020 or SW-7000
Hg	CVAA[g]	SW-7471

a. Detailed analyte lists and EQLs can be found in the ER Project analytical services statement of work (LANL 1995, 49738).
b. GC/ECD = gas chromatography/electron capture detection
c. GC/MS = gas chromatography/mass spectrometry
d. ICPES = inductively coupled plasma emission spectroscopy
e. ICPMS = inductively coupled plasma mass spectrometry
f. GFAA = graphite furnace atomic absorption
g. CVAA = cold vapor atomic absorption

TABLE 5.3.3-2

ANALYTE LIST, ESTIMATED QUANTITATION LIMITS, AND ANALYTICAL METHODS FOR RADIONUCLIDE CONSTITUENTS IN SOIL SAMPLES

Analyte	Detected Emission	EQL (pCi/g)	Analytical Method
Gamma spectroscopy[a]	γ	1[b]	γ-Spectroscopy
Gross-alpha	α	10.0	GPC or LSC
Gross-beta	β	10.0	GPC or LSC
Gross-gamma	γ	2.0	NaI(Tl)[c] or HPGe[d] detection

a. The gamma spectroscopy analyte list is given in the ER Project analytical services statement of work (LANL 1995, 49738).
b. The minimum detectable activity for 241Am and 137Cs is 1 pCi/g; the value for other analytes will vary.
c. NaI(Tl) = thallium-doped sodium iodide
d. HPGe = high-purity germanium

The PCB field test kits (DTECH or equivalent) use the enzyme-linked immunosorbent assay method (immunoassay). This test method is sensitive for the most commonly found PCBs including the following aroclors: 1254, 1242, 1248, 1260, 1262, and 1268. The RFI data showed that the aroclor at this site is 1260. This method is EPA SW-846 proposed method 4020 (PCB) that has been shown to correlate with EPA SW-846 method 8080 (gas chromatography). The detection range for the test kit is 1 to 25 mg/kg in soil samples using the visual colorimetric method. The colorimetric method for the test kits using the optional refloctometer reads in the following value ranges (mg/kg): <0.5, 0.5 to 1.0, 1.1 to 4.0, 4.1 to 15, 16 to 25, and >25. If the results of the PCB analyses using the field test kit are in the 4.1 to 15 mg/kg range or higher during the cleanup activities, additional soil excavation will be performed up to the maximum planned excavation depth (see Section 3.1). When the results of the field test kits are below 4.0 mg/kg, the excavation will cease, and confirmation soil samples will be collected for fixed-site laboratory analyses using SW-846 methods (LANL 1986, 31733).

If the mobile laboratory facility is used to field screen samples for PCBs and SVOCs, modified SW-846 methods will be used.

5.3.4 Sample Handling

All verification samples will be collected following the applicable ER Project standard operating procedures (SOPs) (LANL 1991, 21556) for the collection, preservation, identification, storage, transport, and documentation of samples, as described in Section B3 of the ER Project QAPP (LANL 1996, 43450). All samples will be identified in accordance with LANL-ER-SOP-01.04, R3, "Sample Control and Field Documentation." Chain-of-custody requirements described in LANL-ER-SOP-01.04, R3 will be implemented. The Sample Management Office (SMO) will be consulted regarding the appropriate sample containers and preservation. Samples will be packaged and shipped according to LANL-ER-SOP-01.03, R1, "Handling, Packaging and Shipping of Samples." All samples will be shipped from the SMO to fixed-site laboratories for analysis, except those samples that are submitted to the mobile radiological van for screening purposes.

5.3.5 Data Tracking

The data management scheme described in Sections A10 and B10 of the ER Project QAPP will be followed (LANL 1996, 43450). Manually recorded data will be reviewed by the field team as required by LANL-ER-SOP-01.01,R0, "General Instructions for Field Investigations"; LANL-ER-SOP-01.04,R3; and LANL-ER-SOP-03.12, R0, "Field and Laboratory Notebook Documentation for Environmental Restoration Earth Sciences Studies." Data generated by the analytical laboratories will be submitted to the SMO following the requirements of the ER Project analytical services statement of work (LANL 1995, 49738). The reporting requirements include electronic and hard copy deliverables for routine analyses. The SMO is responsible for data verification, validation, and upload to the Facility for Information Management, Analysis, and Display. The results of radiological screening conducted in the mobile radiological van will be documented and sent to the SMO along with the samples.

5.3.6 Schedule

VCA activities (including time for sample analysis) are planned to be completed during approximately a three-week period (see Table 5.3.6-1). The excavation and removal of contaminated soil is planned to occur in three to five days, during which time confirmation soil sampling and field screening will be performed. Verification soil samples will be collected when the excavation activities are complete. Quick turnaround time (less than two weeks) will be requested for the laboratory analyses.

TABLE 5.3.6-1

SCHEDULE OF ACTIVITIES FOR PRS No. 35-018(a)

VCA Activity	Beginning Date	Number of Days to Complete
Field activities	06/10/96	3–5
Verification sampling	06/14/96	1
Verification sample analysis	06/14/96	15
Decision process	07/01/96	2
Report preparation	07/08/96	20

5.4 Data Assessment

5.4.1 Verification and Routine Data Validation

Data generated by the analytical laboratories will undergo the verification and baseline validation procedures described in Sections D1 and D2 of the ER Project QAPP (LANL 1996, 53450). Field data will be reviewed by the field team at the time of collection.

5.4.2 Data Quality Assessment

Reconciliation of the data with the objectives of the remedial action will be accomplished using the qualitative data quality assessment methods described in Section D3 of the ER Project QAPP (LANL 1996, 53450). The assessment team will assess the sampling design and the analytical data using their best professional judgment. The assessment team usually consists of a geologist, human health risk assessor, ecological risk assessor, statistician, and chemist (at a minimum). The data quality assessment process outlined in Figure D-3 of the QAPP will be followed.

5.5 Administration

5.5.1 Project Task Organization

Table 5.5.1-1 shows the Field Unit 4 project task organization for implementing the field activities described in this SAP.

5.5.2 Training

All ER Project personnel involved with the execution of the SAP will have fulfilled the required training for applicable roles in accordance with the ER worker positions matrix in administrative procedure (AP) LANL-ER-AP-05.2, R1, "Determination, Completion, and Documentation of Environmental Restoration Worker Training" (LANL 1992, 11686). ER Project personnel training records are located on-site during field activities and will be available for inspection. ER Project personnel will not perform tasks under site conditions that require special training beyond that documented in their training records.

TABLE 5.5.1-1

FIELD UNIT 4 KEY PERSONNEL

Functional Role	Name	Organization	Phone
Field Project Management			
Field Project Leader (FPL)	Allyn Pratt	EES-13	667-4308
Field Team Manager (FTM)	Deba Daymon	ERM/Golder	662-1327
Field Team			
Field Team Leader (FTL)	Leslie Sontag	SAIC	672-3666
Geologist	Leslie Sontag	SAIC	672-3666
Site Safety Officer (SSO)	Darril Stafford	SAIC	672-3666
Field Technician/Sampler	Darril Stafford	SAIC	672-3666
Field Technician/Sampler	Carmella Romero	SAIC	672-3666
Alternate Personnel			
Alternate FTL/Geologist	Richard Koch	SAIC	672-3666
Alternate SSO/Sampler	John Hayes	ERM/Golder	662-1348

5.5.3 Records

Field records will document sample collection and tracking, and H&S briefings and checks of monitoring equipment performance, which are documented as engineering surveys in Daily Activity Logs. Table 5.5.3-1 is a summary of required field documents, the appropriate requirement reference, and document recipients. All original documents will be transferred to the ER Project Records-Processing Facility (RPF) in accordance with LANL-ER-AP-02.1, R1, "Procedure for LANL ER Records Management" (LANL 1992, 11686).

Photographs and videotapes may be used to document observations described in Section 2.0 and sample collection activities. Site visit photographic documentation will be referenced in a Daily Activity Log in accordance with LANL-ER-SOP-01.04, R3.

5.5.4 Oversight

Oversight, review, and approval of VCA and SAP activities will be provided by the following Laboratory groups.

- ESH-1 for radiological control technician support and oversight
- ESH-5 for review, approval, and oversight of the SSHASP
- ESH-3 and ESH-5 for review, approval and oversight of the ES&H Project Summary
- ESH-18 for review, approval, and oversight of the Spill Prevention, Control, and Countermeasures Implementation Plan

- CST-5, CST-17, and ESH-19 for review, approval, and oversight of waste disposal
- ER Project Office for review and approval of the VCA plan and final report
- DOE for review and approval of the VCA plan and final report

TABLE 5.5.3-1

FIELD ACTIVITY DOCUMENTATION

Document	Requirement Reference	Document Recipients
Sample Collection and Tracking		
Daily Activity Log	LANL-ER-SOP-01.04, R3[a], Attachment E	FU[b]4 file, RPF
Sample Collection Log	LANL-ER-SOP-01.04, R3[a], Attachment B	FU4 file, RPF
Core Sample Log	LANL-ER-SOP-12.01, R1[a], Attachment E	FU4 file, RPF
Daily Drilling Summary	LANL-ER-SOP-12.01, R1[a], Section 8 (form attached)	FU4 file, RPF
Daily Report Form	FU4 Guidance (form attached)	FU4 file, RPF
Chain of Custody/Request for Analysis Forms	LANL-ER-SOP-01.04, R3[a], Attachment C	FU4 file, RPF
Electronic Follower (COC/Request for Analysis)	LANL-ER-SOP-01.04, R3[a], Section 6.1.5	SMO
Health and Safety		
Tailgate Safety Meeting/Attendee Signoff Sheet	FU4 Guidance (form attached)	FU4 file, RPF
Flame/Photo Ionization Detector Field Data Form	FU4 Guidance (form attached)	FU4 file, RPF
Direct Survey Results	ESH-1 Guidance (form attached)	FU4 file, RPF
Smear Survey Results	ESH-1 Guidance (form attached)	FU4 file, RPF
LAS Survey Results	ESH-1 Guidance (form attached)	FU4 file, RPF
Radiation Grid Survey Results	FU4 Guidance (form attached)	FU4 file, RPF
Daily Safety Inspection Checklist	FU4 Guidance (form attached)	FU4 file, RPF
Daily Drill Rig Inspection Checklist	FU4 Guidance (form attached)	FU4 file, RPF
PPE Inspection Checklist	FU4 Guidance (form attached)	FU4 file, RPF
Equipment and Item Removal Log	FU4 Guidance (form attached)	FU4 file, RPF
Site Access Log	FU4 Guidance (form attached)	FU4 file, RPF
Engineering Surveys		
Daily Activity Log	ER-SOP-01.04, R3[a], Attachment E	FU4 file, RPF

a. LANL 1991, 21556
b. FU = field unit

The ER Project Office may schedule an audit of sampling activities to ensure quality field performance. Such audits will conform to the ER Project quality procedures LANL-ER-QP-01.1, R0, "Audits," and LANL-ER-QP-01.2Q, R0, "Surveys" (LANL 1992, 11686). ESH-5 will evaluate the ER Project field operations to determine compliance with H&S requirements.

5.5.5 Inspection and Acceptance Policies

All activities associated with the VCA and SAP will follow Laboratory policies on inspections and acceptance. All sampling equipment, including sample containers, rinsate water, and sample preservation reagents, are inspected by the FTL upon receipt. The sample containers are certified by the manufacturer for prescribed cleanliness and quality. Sample preservation reagents are received from reputable chemical suppliers with reagent purity certification on the container label.

5.5.6 Reports to Management

The VCA activities and the data obtained pursuant to the SAP will be reported in the final VCA report, which will be delivered to the ER Project Office and DOE around August 1996. The FTL will submit daily activity reports to the field team manager during field activities.

6.0 ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES

The time to complete the proposed soil removal is approximately three to five days, as outlined in Section 5.3.6.

The RFI sample analytical data indicated that for the most part only the top 6 to12 in. of soil are contaminated with PCBs and PAHs. Uncertainties include the possibility of finding a significantly greater amount of contaminated soil at depth or the possibility that the extent of contamination is greater than indicated by the results of the RFI sampling. However, these possibilities are not highly probable.

7.0 ANNEXES

7.1 Risk-Based Cleanup Level Assumptions and Calculations

Risk-based cleanup levels were calculated using as a basis the equations and assumptions specified in the EPA Region IX PRGs (EPA 1995, 53970). This calculation addresses exposure from soil ingestion, dermal contact, and inhalation of resuspended soil particulates or organic vapors; ingestion contributes approximately half as much intake as dermal contact, and inhalation accounts for an insignificant fraction of the estimated exposure. It was assumed that only a tenth of a worker's time would be spent at the site because of the limited size of the PRS. The following equation and parameter values were used to estimate soil cleanup levels for an industrial land use scenario.

$$C = \frac{TR \times BW \times AT \times 365\ \text{days/year}}{EF \times ED \times FS\ [(IRS \times CSF_o \times CF) + (SA \times AF \times ABS \times CSF_o \times CF) \times (IRA \times CSF_i/PEF)]}$$

where:

- C = risk-based cleanup level in mg/kg
- TR = target lifetime cancer risk level of 1 in 100,000
- AT = carcinogenic effects averaging time of 70 years
- EF = exposure frequency of 250 days/year
- ED = exposure duration of 25 years
- FS = fraction of soil exposure that occurs at the PRS assumed to be 0.1
- IRS = soil ingestion rate of 50 mg/day
- CSF_o = oral cancer slope factor (see Table 7.1-1)
- CF = conversion factor of 0.000001 kg/mg
- SA = 25% of adult skin surface area, 5,000 cm^2
- AF = soil adherence factor of 0.2 mg/cm^2
- ABS = skin absorption factor of 0.06 for PCBs and 0.1 for all other chemicals
- IRA = inhalation rate of 20 m^3/day
- CSF_i = inhalation cancer slope factor (see Table 7.1-1)
- PEF = particulate emission factor of $1.316 \times 10^9/m^3/kg$ (or a chemical-specificc volatilization factor is used if the molecular weight is <200 g/mole and Henry's constant is > 1×10^5 atm x m^3/mole)

TABLE 7.1-1

TOXICITY VALUES FOR COPCs AND OTHER DETECTED ORGANIC CHEMICALS

COPC or Other Detected Organic Chemical	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Inhalation Slope Factor $(mg/kg\text{-}d)^{-1}$	Oral Reference Dose (mg/kg-d)	Inhalation Reference Dose (mg/kg-d)
PCBs	7.7	7.7	—	—
Benzo[a]anthracene	0.73	0.73	—	—
Benzo[b]fluoranthene	0.73	0.73	—	—
Benzo[a]pyrene	7.3	7.3	—	—
Benzo[k]fluoranthene	0.073	0.073	—	—
Dibenzo[a,h]anthracene	7.3	7.3	—	—
Indeno[1,2,3-cd]pyrene	0.73	0.73	—	—
Dieldrin	16	16	0.00005	0.00005
Acenaphthene	—	—	0.06	0.06
Anthracene	—	—	0.3	0.3
Chrysene	0.0073	0.0073	—	—
Dibenzofuran	—	—	0.004	0.004
Fluoranthene	—	—	0.04	0.04
Fluorene	—	—	0.04	0.04
Naphthalene	—	—	0.04	0.04
Pyrene	—	—	0.03	0.03

7.2 RFI Analytical Results

Table 7.2-1 contains the PCB results above the SAL value of 1 mg/kg that were obtained during the RFI; Table 7.2-2 contains the SVOC results above the respective SAL value for each chemical. Table 7.2-3 contains the results of the gross-alpha, -beta, and -gamma radiation screening for all RFI samples.

TABLE 7.2-1

PCB RESULTS IN SOIL SAMPLES EXCEEDING SAL*

Location ID No.	Depth Interval (ft)	Sample ID No.	Result (mg/kg)
35-2232	0–0.5	0435-95-0065	**81.6**
35-2233	0–1	0435-95-0069	**105.77**
35-2233	1–2	0435-95-0071	1.41
35-2234	1–2	0435-95-0074	6.49
35-2262	0–1	0435-95-0140	6.27
35-2262	1–1.5	0435-95-0142	1.92
35-2264	0–1	0435-95-0146	**152.36**
35-2265	2–3	0435-95-0153	3.42
35-2266	0–1	0435-95-0156	1.26
35-2267	0–1	0435-95-0159	2.95

* SAL = 1 mg/kg
The bolded values exceed the risk-based cleanup level for PCBs.

TABLE 7.2-2

SVOC AND PESTICIDE RESULTS ABOVE SALs

Location ID No.	Depth Int. (ft)	Sample ID No.	Analyte*	Result (mg/kg)	SAL (mg/kg)	Result/SAL
35-2232	0–0.5	0435-95-0065	Benzo[a]anthracene	12	0.61	20
			Benzo[b]fluoranthene	8	0.61	13
			Benzo[a]pyrene	7.3	0.061	120
			Indeno[1,2,3-cd]pyrene	5.8	0.61	10
			Dibenzo[a,h]anthracene	2	0.061	33
			Dieldrin	0.269	0.028	10
35-2260	0–1	0435-95-0133	Benzo[b]fluoranthene	3.38	0.61	6
35-2261	0–1	0435-95-0137	Indeno[1,2,3-cd]pyrene	7.23	0.61	12
			Benzo[a]pyrene	7.81	0.061	128
			Benzo[b]fluoranthene	13.69	0.61	22
			Benzo[k]fluoranthene	7.81	6.1	1
			Dibenzo[a,h]anthracene	5.15	0.061	84
35-2262	0–1	0435-95-0140	Indeno[1,2,3-cd]pyrene	4.6	0.61	8
			Dibenzo[a,h]anthracene	4.3	0.061	70
			Benzo[a]pyrene	3.1	0.061	51
			Benzo[a]anthracene	5.36	0.61	9
35-2262	1–1.5	0435-95-0142	Benzo[b]fluoranthene	3.46	0.61	6
			Benzo[a]anthracene	4.17	0.61	7
			Indeno[1,2,3-cd]pyrene	4.34	0.61	7
35-2263	0–1	0435-95-0146	Dibenzo[a,h]anthracene	4.33	0.061	71
			Benzo[a]pyrene	3.78	0.061	62
			Benzo[a]anthracene	6.09	0.61	10
			Benzo[b]fluoranthene	5.47	0.61	9
			Indeno[1,2,3-cd]pyrene	4.74	0.61	8
35-2263	1–2	0435-95-0147	Indeno(1,2,3-cd)pyrene	4.32	0.61	7
			Benzo[b]fluoranthene	3.48	0.61	6
			Benzo[a]anthracene	4.15	0.61	7
35-2263	2–2.5	0435-95-0148	Dibenzo[a,h]anthracene	4.37	0.061	72
			Indeno[1,2,3-cd]pyrene	4.64	0.61	8
			Benzo[b]fluoranthene	4.71	0.61	8
			Benzo[a]pyrene	3.39	0.061	56
			Benzo[a]anthracene	5.51	0.61	9
35-2264	0–1	0435-95-0149	Benzo[b]fluoranthene	3.64	0.61	6
			Benzo[a]anthracene	4.39	0.61	7
			Indeno[1,2,3-cd]pyrene	4.39	0.61	7
35-2265	0–1	0435-95-0152	Indeno[1,2,3-cd]pyrene	4.82	0.61	8
			Dibenzo[a,h]anthracene	4.35	0.061	71
			Benzo[a]anthracene	6.74	0.61	11
			Benzo[a]pyrene	3.93	0.061	64
			Benzo[b]fluoranthene	5.92	0.61	10
35-2265	1–2	0435-95-0153	Benzo[a]anthracene	3.96	0.61	6
35-2266	1–2	0435-95-0156	Benzo[b]fluoranthene	3.44	0.61	6
			Benzo[a]anthracene	4.18	0.61	7
35-2266	1–2	0435-95-0157	Benzo[b]fluoranthene	3	0.61	5

* The sample results were obtained using a screening analytical method performed in a mobile laboratory facility. The analysis could not resolve benzo[a]pyrene and benzo[k]fluoranthene.

TABLE 7.2-3

RFI SAMPLE GROSS RADIATION SCREENING RESULTS[a,b,c]

Locatio ID No.	Depth (ft)	Sample ID No.	Alpha	Alpha unc[d]	Beta	Beta unc[d]	Gamma	Gamma unc[d]
35-2232	0.5	0435-95-0065	6.26	58.93	-5.99	18.43	-1.31	0.37
35-2233	1	0435-95-0069	–6.26	58.93	-6.79	19.62	0.06	0.08
35-2233	2	0435-95-0071	–6.26	58.93	-0.4	4.76	-2.37	0.49
35-2233	3	0435-95-0073	6.26	58.93	-11.1	25.09	-1.91	0.44
35-2234	1	0435-95-0074	6.26	58.93	-3.43	13.95	-0.96	0.31
35-2234	2	0435-95-0076	6.26	58.93	-5.99	18.43	-0.69	0.27
35-2234	3	0435-95-0077	6.26	58.93	6.79	19.72	-1.51	0.39
35-2259	1	0435-95-0130	–5.85	24.82	-17.14	35.03	3.13	0.25
35-2259	1.5	0435-95-0131	5.85	24.82	-7.73	13.15	0.82	0.13
35-2260	1	0435-95-0133	–5.85	24.82	-14.66	18.11	0.77	0.12
35-2260	2	0435-95-0134	–5.85	24.82	-19.63	20.96	0.77	0.12
35-2260	3	0435-95-0136	–5.85	24.82	-4.71	10.26	0.80	0.12
35-2261	1	0435-95-0137	5.85	24.82	-20.17	21.25	1.07	0.14
35-2261	2	0435-95-0138	–5.85	24.82	-12.17	16.50	1.53	0.17
35-2261	3	0435-95-0139	5.85	24.82	-12.17	16.50	1.55	0.17
35-2262	1	0435-95-0140	17.55	42.99	6.66	12.21	2.04	0.20
35-2262	1.5	0435-95-0142	5.85	24.82	22.12	22.25	0.56	0.10
35-2263	1	0435-95-0146	5.85	24.82	7.19	12.69	1.42	0.17
35-2263	2	0435-95-0147	5.85	24.82	27.09	24.63	3.53	0.26
35-2263	3	0435-95-0148	17.55	42.99	-5.78	11.37	2.36	0.21
35-2264	1	0435-95-0149	–5.85	24.82	0.27	2.45	1.87	0.19
35-2264	2	0435-95-0150	5.85	24.82	-15.19	18.44	1.58	0.17
35-2264	3	0435-95-0151	–5.85	24.82	-9.68	14.72	3.16	0.25
35-2265	1	0435-95-0152	5.85	24.82	-2.76	7.85	2.17	0.20
35-2265	2	0435-95-0153	-5.85	24.82	-2.22	7.05	3.49	0.26
35-2265	3	0435-95-0154	40.95	65.67	-6.85	12.38	2.75	0.23
35-2266	1	0435-95-0156	17.55	42.99	-8.27	13.60	1.79	0.19
35-2266	2	0435-95-0157	17.55	42.99	-13.24	17.22	6.79	0.36
35-2266	3	0435-95-0158	–5.85	24.82	-17.14	19.59	11.33	0.47
35-2267	1	0435-95-0159	–5.85	24.82	-14.66	18.11	8.51	0.41
35-2267	2	0435-95-0160	–5.85	24.82	-7.19	12.69	6.12	0.34
35-2267	3	0435-95-0161	29.25	55.50	11.10	15.76	6.75	0.36
35-2268	1	0435-95-0162	17.55	42.99	-10.75	15.51	6.88	0.36
35-2268	2	0435-95-0164	–5.85	24.82	-4.71	10.26	5.95	0.34
35-2268	3	0435-95-0165	–5.85	24.82	5.24	10.83	2.82	0.23

a. No SAL values are available for gross radiation screening data.
b. pCi/g
c. Results are from the mobile laboratory facility and are presented for waste characterization purposes only.
d. unc = uncertainty in measurement

TABLE 7.2-4

TPH RESULTS IN SOIL SAMPLES

Location ID No.	Depth Interval (ft)	Sample ID No.	TPH Result (mg/kg)
35-2259	0–1	0435-95-0130	110
35-2259	1–1.5	0435-95-0131	160
35-2260	0–1	0435-95-0133	400
35-2260	1–2	0435-95-0134	370
35-2260	1–2	0435-95-0135	440
35-2260	2–3	0435-95-0136	400
35-2261	0–1	0435-95-0137	42
35-2261	1–2	0435-95-0138	240
35-2261	2–3	0435-95-0139	130
35-2262	0–1	0435-95-0140	17
35-2262	1–1.5	0435-95-0142	88
35-2262	1–1.5	0435-95-0443	140
35-2263	0–1	0435-95-0146	160
35-2263	1–2	0435-95-0147	ND
35-2263	2–2.5	0435-95-0148	82
35-2264	0–1	0435-95-0149	1020
35-2264	1–2	0435-95-0150	140
35-2264	2–3	0435-95-0151	23
35-2265	0–1	0435-95-0152	180
35-2265	1–2	0435-95-0153	ND
35-2265	2–3	0435-95-0154	10
35-2266	0–1	0435-95-0156	100
35-2266	1–2	0435-95-0157	400
35-2266	2–3	0435-95-0158	190
35-2267	0–1	0435-95-0159	68
35-2267	1–2	0435-95-0160	72
35-2267	2–3	0435-95-0161	ND
35-2268	0–1	0435-95-0162	57
35-2268	1–2	0435-95-0164	15
35-2268	2–3	0435-95-0165	22

7.3 Implementation Standard Operating Procedures

The ER Project SOPs are located in Volumes I and II, as updated to 1995 (LANL 1991, 21556).

7.4 Quality Assurance Plan

The ER Project QAPP (LANL 1996, 53450) will be followed throughout the VCA activities.

7.5 Site-Specific Health and Safety Plan

The VCA will be performed in accordance with the approved SSHASP, which is attached.

Los Alamos National Laboratory

ER PROJECT SHORT FORM SSHASP

SSHASP Number 099

Location TA-35 PRS 35-018(a) *Field Unit* 4

Task Name Voluntary Corrective Action *Date* /

SSO Approval *Date* 5/3/96

Field Project Leader Approval *Date* 5/8/96

Field Unit HS Rep. Approval *Date* 5/9/96

ESH-1 ER/D&D Team Leader *Date* 5/3/96

Subcontractor HS Approval *Date* 5/3/96

Field Team Manager Approval *Date* 5/3/96

Key Personnel

Field Unit Representative Allyn Pratt *Phone/Pager* 667-4308/

Field Team Manager Deba Daymon *Phone/Pager* 662-1327/470-1092

Field Team Leader Leslie Sontag *Phone/Pager* 672-3666/699-1702

Site Safety Officer Darril Stafford/John Hayes (alternate) *Phone/Pager* 672-3666/699-2762

RCT Darril Stafford/John Hayes *Phone/Pager* 672-3666/699-2762

Field Unit HS Representative Bill Brazile *Phone/Pager* 665-5128/104-6845 (665-9800)

ESH-1 Oversight Marty Peifer *Phone/Pager* 667-0083/104-6649 (665-9800)

Task Description

TA-35 is located on a finger mesa between Mortandad Canyon on the north and Ten Site Canyon on the south. PRS No. 35-018(a) is located adjacent to a transformer (PCB ID No. 5024) at the Transformer Substation (TA-35-32). During a 1985 survey, the transformer was reported to be dripping coolant fluid onto a porous concrete pad with no spill containment. Phase I site characterization confirmed the presence of poly-chlorinated biphenyls (PCBs), and semi-volatile organic compounds (SVOCs) in the surrounding soils above LANL screening action levels (SALs). This PRS will be remediated as a voluntary corrective action (VCA). Remediation will involve excavation of the contaminated soil to a maximum depth of 3 ft. Electrical lines associated with the transformer are 480 v and buried at a depth of 3 feet and encased in concrete, therefore initial excavation will be performed utilizing hand tools (shovels). Depending on the extent of contamination, heavy equipment (bobcat or backhoe) may be used for additional soil removal, however every effort will be used to avoid the use of heavy equipment due to the presence of the buried electrical lines. The tasks associated with this VCA are summarized in Appendix A.

Hazard Analysis

List all chemical, biological, physical, and radiological hazards associated with this task including hazard assessment ratings (ER Project HASP, Appendix C).

Chemical: SVOCs - Previous sampling indicates low concentrations in soil. HAR of Negligible. PCBs - Sample results in soil range from moderately low to extremely low. HAR of Minor. (Hazard analysis ranking) (Data Attached)

Biological: Recent work and a health and safety walkover identified no biological hazards at this site, however potential biological hazards (ticks, spiders, and ants) will be addressed in the tailgate health and safety briefing. HAR of Negligible.

Physical: Slips, trips, and falls, working around an open excavation, noise, working around heavy equipment. HAR of Minor. Underground utilities gas, water, electrical. If excavation is required below 2.5 ft, an electrical outage will be initiated. HAR of Serious.

Radiological: Prior sampling indicates no radiological contamination present at this PRS. HAR of Negligible. (Data attached)

List all other associated Special Work Permits/Procedures and Number :
(include RWP, SWP, CSP, LO/TO, Spark/Flame, etc.) : Excavation Permit.

Will task affect other LANL operations, other employees, or other tasks? No____Yes X
If yes, explain precautions taken and contacts notified: If excavation is required below 2.5 ft, an electrical outage will be needed to prevent the possibility of electrical shock due to underground utilities. The TA-35 engineering coordinator (Howard Rice) will be contacted if an outage is required, and the proper channels will be notified as to the time and date of this outage.

Hazard Controls

Engineering/Administrative Controls, Special Equipment, etc. Dust suppression techniques (wetting) will be used to keep dust levels at a minimum. All lines are encased in cement or pvc and depths are known to be over 2.5 ft. according to JCI utilities crew. In addition extreme care will be used when removing soil around utility markouts. Heavy equipment may be used to excavate contaminated soil. Shoring and/or sloping shall be implemented if the excavation exceeds 5 ft (this is not anticipated).

Additional Comments Attached: Yes__No X

Head Hard Hat (if heavy equipment is being utilized)
Face & Eye Safety Glasses
Gloves Outer = leather Inner = Nitrile will be worn when handling contaminated soil.
Hearing Hearing protection will be worn if noise levels exceed 85 dB(A) An initial survey will be performed to establish zones.
Body Coveralls (cotton or Kleenguard at SSO discretion)
Foot Steel toes
Respiratory: Type of Respirator N/A Type of Cartridge

Monitoring

List all personnel and area monitoring to be performed for this task, including action levels and equipment to be used, and any dosimetry requirements.

Chemical: A FID will be used to monitor for all SVOC and VOC constituents. Action level will be 5 ppm above background sustained for 1 minute in the breathing zone. A mini-ram will be used periodically to monitor total dust in the workers breathing zone. Action level set at 1.6mg/m^3 based on 50% of the Permissible Exposure Limit and the low concentration of PCBs present in the soil. Prior sampling indicates a maximum PCB concentration of 152 ppm.

Biological: None

Physical: If noise exceeds 85 dB(A), noise level monitoring will be conducted. Hearing protection will be worn during initial survey.

Radiological: β/γ ESP-1 with HP-260 probe or equivalent. α -Ludlum 139 with air proportional probe or equivalent. In addition, health physics personal dosimetry will be required (Appendix B). This screening and dosimetry will be used as a precaution. No radiological contamination has been found at this site, however process knowledge indicates that initial operations at TA-35 involved a variety of radionuclides, therefore the possibility of encountering radioactive contamination does exist. In addition a μ R/ hr instrument or equivalent will be kept on site to ensure exposures do not exceed LANL's administrative limit of 100 mRem/ year.

Site Control

Describe how site access and control will be maintained. Attach a site map.

The site shall be marked off with cones and tape to prevent unauthorized entrance. EZ, CRZ, and SZ shall be established around the PRS or excavation.

Decontamination

Describe how decon will be performed and which option will be used (ER Project HASP, Section 8).

Decon will be performed using ER Project HASP Option 1 (Appendix C). Decon of equipment will be done in the EZ with decon waste stored on-site. All personnel and equipment will be screened by an RCT for radiological contamination prior to release.

Spill Containment

Spill Containment

Unless site personnel are trained to the first responder operations level, all site spills will be handled by LANL Emergency Management and Response (EM&R).

Emergency Response

Attach an emergency call-out list and a route to ESH-2/LAMC (See Appendix D).

First-Aid/CPR Provider: Darril Stafford / Leslie Sontag

Communications: Cellular phone will be on-site (699-1702/699-2762)

Incident Response Equipment: An approved first-aid kit, BBP kit, and eye wash shall be kept in the SZ.

Fire Extinguishing Equipment: A 20 lb. ABC fire extinguisher shall be kept in the SZ.

Medical Surveillance

List all medical surveillance required for this task (ER Project HASP, Section 11).

All personnel shall be medically approved for HAZWOPER work. Hearing conservation if noise levels exceed 85 dB(A). In addition, health physics personal dosimetry will be required per attached Appendix B.

Training Requirements

Attach a copy of an appropriate training matrix (ER Project HASP, Section 10).

See Appendix E

Participant Acknowledgment: (Per ER Project HASP, Sections 1.2 and 10.1.3)

*Pre-job Conference: Date/Initials*_____

Printed Name	Z Number	Signature	Date
Darrel Stafford	113569		5/10/96
Richard Koch	114816		5/10/96
Leslie Salinas	117380		5/10/96
Carmella Romero	099070		5/10/96
Richard Hutton	113375		5/10/96

Appendix A
Scope of Work

Task ID	Task Description	Potential Contaminants & Hazards	Anticipated Dates/Duration
Task 1 - Site Preparation	**This task involves all activities performed at the site before cleanup operations begin.** **1-A Equipment preparation / Mobilization :** This task will include utility markouts, installation of zone barriers, and equipment mobilization and preparation.	None	5/1/96-6/1/96
Task 2 - Site Cleanup Operations	**This task includes all activities directly involved with or taking place during site cleanup to DOE and EPA acceptance criteria.** **2-A Hand Excavation :** Workers will excavate the contaminated soil using shovels, spades, pick and other hand tools. **2-B Heavy Equipment Excavation :** Workers may use bobcat or backhoe for excavation. Final depth will be determined by the results of verification sampling. **2-C Exposure Monitoring :** Use of real-time and integrated monitoring equipment to screen for employee exposures for radiological, chemical, physical and safety hazards in the EZ. **2-D Verification Sampling :** Using a scoop and sample bowl, a sampling technician will obtain and prepare surface samples for verification that cleanup operations have been completed.	PCBs, SVOCs	5/1/96-6/1/96
Task 3 - On-site Waste Management	**On-site coordination of waste management, including identification, handling, sampling, transport, and disposition of non-hazardous, potentially hazardous and hazardous wastes.** **3-A Containing and Labeling Wastes :** Workers in the EZ will be putting soil removed during excavation into drums or roll off bins. Drums will be labeled to indicate excavation depth. **3-B Drum Storage :** Workers will be performing limited drum handling within the EZ to arrange containers appropriately for on-site storage. **3 C - Post Cleanup Waste Management :** Following cleanup activities, waste containers will be stored within PRS boundary. This task will involve labeling, drum handling, and drum sampling within the waste management area.	PCBs, SVOCs	5/1/96-6/1/96

Task 4 - **Site Completion**	**This task consists of activities carried out after the determination has been made that excavation operations have brought the site to a state which meets the cleanup criteria.** **4-A Equipment decontamination :** Workers will use pressurized and/or steam cleaning solutions (aqueous) to clean potentially/actually contaminated equipment. If this is needed, a decon pad will be made using thick non-porous plastic. **4-B Demobilization :** Following receipt of acceptable verification results from soil samples zone barriers and all equipment will be removed from the site. **4-C Backfilling :** Following demobilization, a work crew will backfill the excavation with clean backfill using a bobcat or backhoe.	PCBs, SVOCs	5/1/96-6/1/96

APPENDIX B

PERSONAL DOSIMETRY REQUIREMENTS

HEALTH PHYSICS (RADIATION) *[Refer to Section 6 of the HASP.]*

Hazardous Substance/ Condition	Task(s)	Action Level(s)	Dosimetry Requirement	Action Level(s) Rationale
External Sources of Radiation Exposure	All	Potential to exceed 100 mREM/year dose limit	Monthly TLD Badge	10 CFR 835
Internal Sources of Radiation Exposure	All	Potential to exceed 100 mREM/year dose limit	Urinalysis - Invitro may be required if conditions warrant and shall be specified by ESH-1/ESH-12	10 CFR 835

APPENDIX C
PERSONNEL AND EQUIPMENT DECONTAMINATION

Personnel and Environmental Monitoring Equipment (EME)

DECON REQUIREMENTS	Tasks			
	1	2	3	4
Option I Standard Approach Level D				
Wash Soap	X	X	NA	X
Wash Solvent	NA	X (water)	NA	X (water)
Aqueous Rinse	NA	X	NA	X
PPE to be Disposed	NA	X	X	X

Sampling and Heavy Equipment

DECON REQUIREMENTS	TASK(s)			
	1	2	3	4
Sampling Equipment Decon				
Localized at work site in CRZ	NA	X	NA	X
Wash Soap	NA	X	NA	X
Wash Solvent	NA	X (water)	NA	X (water)
Heavy Equipment Decon				
Localized at work site in CRZ	NA	X	NA	X
Wash Soap	NA	X	NA	X
Wash Solvent	NA	X (water)	NA	X (water)

APPENDIX D
EMERGENCY CONTACTS AND PHONE NUMBERS

MEDICAL EMERGENCY/FIRE:

Los Alamos Fire Dept. **667-7080**

HAZARDOUS RELEASE/SPILL:

LANL HAZMAT Team (EM&R) **667-6211**

LANL Occupational Medicine Clinic (ESH-2) **667-7848**
Los Alamos Medical Center Hospital **662-2455**
Security OS/Pro Force **667-6534**
Los Alamos Police **662-8222**
LANL Health and Safety ESH-5 ..... **665-7221**
LANL ESH-1 Team Leader Pat La Frate **667-8366/104-7262**
FPL: Allyn Pratt **667-4308**
Alternate FPL: Dave Broxton **667-2492**
FTM:Deba Daymon **662-3700, 470-1092**
FTL: Leslie Sontag **672-3666, 699-1702**
Field Unit HS Rep.: Bill Brazile ..... **665-5128,104-6845** **access 665-9800**
Field Unit RCT: Marty Peifer ..... **667-0083,104-6649** **access 665-9800**

Management Contacts:

ERM/Golder Contacts: **Al Funk 662-3700, John Williams 662-3700**

Construction Project Coordinator: **Henry Nunez (505) 699-1318**

EMERGENCY REPORTING INFORMATION:

When calling for emergency services, have the following information available to report:

- Site name/location/phone #
- Number of personnel involved
- Caller ID
- Name and condition of affected employees
- Nature of emergency
- Actions taken and assistance required

APPENDIX E

Training Requirements

R = Read training; C = Class training; F = Field training; AN = As needed per the HASP; ER = Employer required.

Training Requirements	Personnel Role				
	FTM	FTL/ Sampler	SSO/ RCT	Waste Mgt	Heavy Equipment Operator
HASP	R	R	R	R	R
SSHASP	R	R	R	R	R
Pre-Job Brief	F or C	F or C	F or C	F or C	F or C
Daily Tailgate	F	F	F	F	F
TA Specific	C	C	C	C	C
GET	C	C	C	C	C
HazCom	R	R	R	R	R
Conduct Oper	R	R	R	R	R
Occurrence Reporting	R	R	R	R	R
OSHA Rights	R	R	R	R	R
Health Physics Checklist	C	C	C	C	C
Rad Worker II	C	C	C	C	C
40 Hr Worker	C	C	C	C	C
*24 Hr Field Training	F	F	F	F	F
8 Hr Supervisor	C	C			
8 Hr Refresher	C	C	C	C	C
First Aid			C		
CPR			C		
Sanitation [29 CFR 1926.51]			R		
Signs, Signals, Barricades [29 CFR 1926.200]			R		
Excavation/Trenching Competent Person [29 CFR 1926.651(k)(1) and 32(f)]		R	R		R
First Responder Awareness			C		
PPE (level D)	F	F	F	F	F
Lead [29 CFR 1926.62]	A/N	A/N	R	A/N	A/N
Arsenic - inorganic [29 CFR 1926.1118]	A/N	A/N	R	A/N	A/N
Beryllium [LANL-AR 6-7]	A/N	A/N	R	A/N	A/N
Cadmium [29 CFR 1926.63]	A/N	A/N	R	A/N	A/N
Bloodborne Pathogens			C		

Table 1

PRS 35-018(a) PCB Data, above SAL[1]

Site ID	Depth interval (ft.)	Sample ID.	Sample type	Result[2]
35-2232	0-0.5	0435-95-0065	soil	**81.6**
35-2233	0-1	0435-95-0069	soil	**105.77**
35-2233	1-2	0435-95-0071	soil	1.41
35-2234	1-2	0435-95-0074	soil	6.49
35-2262	0-1	0435-95-0140	soil	6.27
35-2262	1-1.5	0435-95-0142	soil	1.92
35-2264	0-1	0435-95-0146	soil	**152.36**
35-2265	2-3	0435-95-0153	soil	3.42
35-2266	0-1	0435-95-0156	soil	1.26
35-2267	0-1	0435-95-0159	soil	2.95

[1] SAL = 1 mg/kg
[2] Units in mg/kg
Bold Values are sites to be addressed by the VCA activities

Table 2

PRS 35-018(a) SVOC Data, above SALs

Site ID	Depth interval (ft.)	Sample ID	Sample type	Analyte	Result[1]	SAL[1]
35-2232	0-0.5	0435-95-0065	soil	Benzo(a)anthracene	12.0	0.61
				Benzo(b)fluoranthene	8.0	0.61
				Benzo(a)pyrene	**7.3**	0.061
				Indeno(1,2,3-cd)pyrene	5.8	0.61
				Dibenzo(a,h)anthracene	2.0	0.061
				Dieldrin	0.269	0.028
35-2260	0-1	0435-95-0133	soil	Benzo(b)fluoranthene	3.38	0.61
35-2261	0-1	0435-95-0137	soil	Indeno(1,2,3-cd)pyrene	7.23	0.61
				Benzo(a)pyrene	**7.81**	0.061
				Benzo(b)fluoranthene	13.69	0.61
				Benzo(k)fluoranthene	7.81	6.1
				Dibenzo(a,h)anthracene	5.15	0.061
35-2262	0-1	0435-95-0140	soil	Indeno(1,2,3-cd)pyrene	4.6	0.61
				Dibenzo(a,h)anthracene	4.3	0.061
				Benzo(a)pyrene	3.1	0.061
				Benzo(a)anthracene	5.36	0.61
35-2262	1-1.5	0435-95-0142	soil	Benzo(b)fluoranthene	3.46	0.61
				Benzo(a)anthracene	4.17	0.61
				Indeno(1,2,3-cd)pyrene	4.34	0.61
35-2263	0-1	0435-95-0146	soil	Dibenzo(a,h)anthracene	4.33	0.061
				Benzo(a)pyrene	3.78	0.061
				Benzo(a)anthracene	6.09	0.61
				Benzo(b)fluoranthene	5.47	0.61
				Indeno(1,2,3-cd)pyrene	4.74	0.61
35-2263	1-2	0435-95-0147	soil	Indeno(1,2,3-cd)pyrene	4.32	0.61
				Benzo(b)fluoranthene	3.48	0.61
				Benzo(a)anthracene	4.15	0.61
35-2263	2-2.5	0435-95-0148	soil	Dibenzo(a,h)anthracene	4.37	0.061
				Indeno(1,2,3-cd)pyrene	4.64	0.61
				Benzo(b)fluoranthene	4.71	0.61
				Benzo(a)pyrene	3.39	0.061
				Benzo(a)anthracene	5.51	0.61
35-2264	0-1	0435-95-0149	soil	Benzo(b)fluoranthene	3.64	0.61
				Benzo(a)anthracene	4.39	0.61
				Indeno(1,2,3-cd)pyrene	4.39	0.61
35-2265	0-1	0435-95-0152	soil	Indeno(1,2,3-cd)pyrene	4.82	0.61
				Dibenzo(a,h)anthracene	4.35	0.061
				Benzo(a)anthracene	6.74	0.61
				Benzo(a)pyrene	3.93	0.061
				Benzo(b)fluoranthene	5.92	0.61
35-2265	1-2	0435-95-0153	soil	Benzo(a)anthracene	3.96	0.61
35-2266	0-1	0435-95-0156	soil	Benzo(b)fluoranthene	3.44	0.61
				Benzo(a)anthracene	4.18	0.61
35-2266	1-2	0435-95-0157	soil	Benzo(b)fluoranthene	3.0	0.61

[1] Units in mg/kg

Bold Values are sites to be addressed by the VCA activities

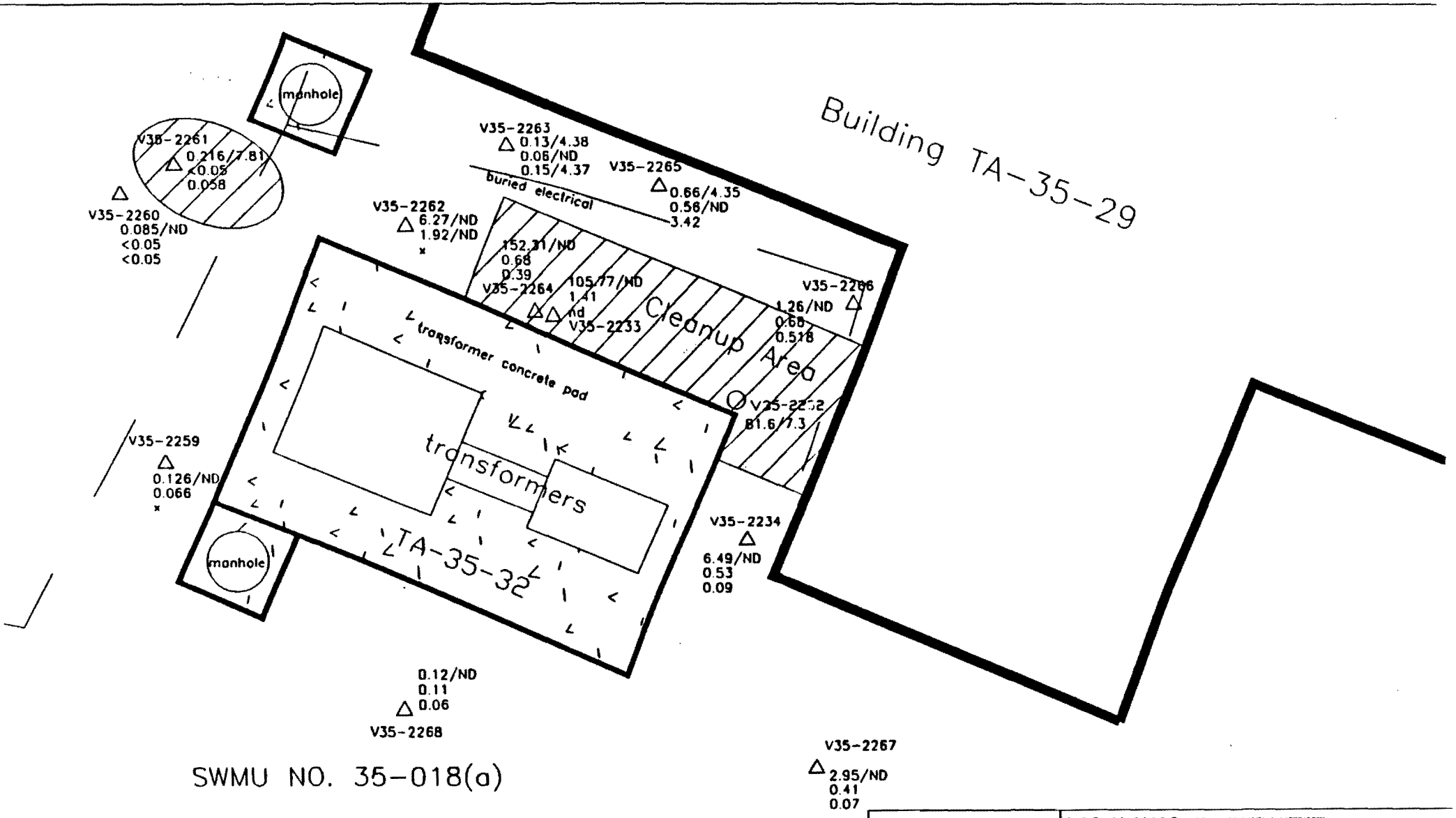
Table 3

PRS No. 35-018(a) RFI Sample Gross Radiation Screening Results[1]

SITE ID	Depth	Sample ID	Alpha	Alpha unc*	Beta	Beta unc*	Gamma	Gamma unc*	units
35-2232	6"	0435-95-0065	6.26	58.93	-5.99	18.43	-1.31	0.37	pCi/g
35-2233	12"	0435-95-0069	-6.26	58.93	-6.79	19.62	0.06	0.08	pCi/g
35-2233	24"	0435-95-0071	-6.26	58.93	-0.4	4.76	-2.37	0.49	pCi/g
35-2233	36"	0435-95-0073	6.26	58.93	-11.1	25.09	-1.91	0.44	pCi/g
35-2234	12"	0435-95-0074	6.26	58.93	-3.43	13.95	-0.96	0.31	pCi/g
35-2234	24"	0435-95-0076	6.26	58.93	-5.99	18.43	-0.69	0.27	pCi/g
35-2234	36"	0435-95-0077	6.26	58.93	6.79	19.72	-1.51	0.39	pCi/g
35-2259	12"	0435-95-0130	-5.85	24.82	-17.14	35.03	3.13	0.25	pCi/g
35-2259	18"	0435-95-0131	5.85	24.82	-7.73	13.15	0.82	0.13	pCi/g
35-2260	12"	0435-95-0133	-5.85	24.82	-14.66	18.11	0.77	0.12	pCi/g
35-2260	24"	0435-95-0134	-5.85	24.82	-19.63	20.96	0.77	0.12	pCi/g
35-2260	36"	0435-95-0136	-5.85	24.82	-4.71	10.26	0.80	0.12	pCi/g
35-2261	12"	0435-95-0137	5.85	24.82	-20.17	21.25	1.07	0.14	pCi/g
35-2261	24"	0435-95-0138	-5.85	24.82	-12.17	16.50	1.53	0.17	pCi/g
35-2261	36"	0435-95-0139	5.85	24.82	-12.17	16.50	1.55	0.17	pCi/g
35-2262	12"	0435-95-0140	17.55	42.99	6.66	12.21	2.04	0.20	pCi/g
35-2262	18"	0435-95-0142	5.85	24.82	22.12	22.25	0.56	0.10	pCi/g
35-2263	12"	0435-95-0146	5.85	24.82	7.19	12.69	1.42	0.17	pCi/g
35-2263	24"	0435-95-0147	5.85	24.82	27.09	24.63	3.53	0.26	pCi/g
35-2263	36"	0435-95-0148	17.55	42.99	-5.78	11.37	2.36	0.21	pCi/g
35-2264	12"	0435-95-0149	-5.85	24.82	0.27	2.45	1.87	0.19	pCi/g
35-2264	24"	0435-95-0150	5.85	24.82	-15.19	18.44	1.58	0.17	pCi/g
35-2264	36"	0435-95-0151	-5.85	24.82	-9.68	14.72	3.16	0.25	pCi/g
35-2265	12"	0435-95-0152	5.85	24.82	-2.76	7.85	2.17	0.20	pCi/g
35-2265	24"	0435-95-0153	-5.85	24.82	-2.22	7.05	3.49	0.26	pCi/g
35-2265	36"	0435-95-0154	40.95	65.67	-6.85	12.38	2.75	0.23	pCi/g
35-2266	12"	0435-95-0156	17.55	42.99	-8.27	13.60	1.79	0.19	pCi/g
35-2266	24"	0435-95-0157	17.55	42.99	-13.24	17.22	6.79	0.36	pCi/g
35-2266	36"	0435-95-0158	-5.85	24.82	-17.14	19.59	11.33	0.47	pCi/g
35-2267	12"	0435-95-0159	-5.85	24.82	-14.66	18.11	8.51	0.41	pCi/g
35-2267	24"	0435-95-0160	-5.85	24.82	-7.19	12.69	6.12	0.34	pCi/g
35-2267	36"	0435-95-0161	29.25	55.50	11.10	15.76	6.75	0.36	pCi/g
35-2268	12"	0435-95-0162	17.55	42.99	-10.75	15.51	6.88	0.36	pCi/g
35-2268	24"	0435-95-0164	-5.85	24.82	-4.71	10.26	5.95	0.34	pCi/g
35-2268	36"	0435-95-0165	-5.85	24.82	5.24	10.83	2.82	0.23	pCi/g

[1] No SAL Values are available for Gross Radiation Screening Data

* unc = Uncertainty in measurement



SWMU NO. 35-018(a)

VCA Area

△ 3 Ft deep hand-auger

O surface sample

Analytical Results: (ppm)
(PAH=[benzo(a)pyrene or dibenzo(a,h)anthracene] > SAL)
0.12/ND PCB/PAH Value 0-1'
0.11 PCB/PAH Value 1-2'

10 20
Scale in Feet

N

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN FEET

DRAWN RJK	DATE 4/96
CHECKED	

LOS ALAMOS LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87544
Environmental Restoration Project
Field Unit 4
SAI
122 LONGVIEW DR., LOS ALAMOS, NM 875

FU-4, OU 1129, PRS No. 35-018(a)
VCA Site Plan, TA-35

SIZE | FSCM NO. | DWG NO. | REV

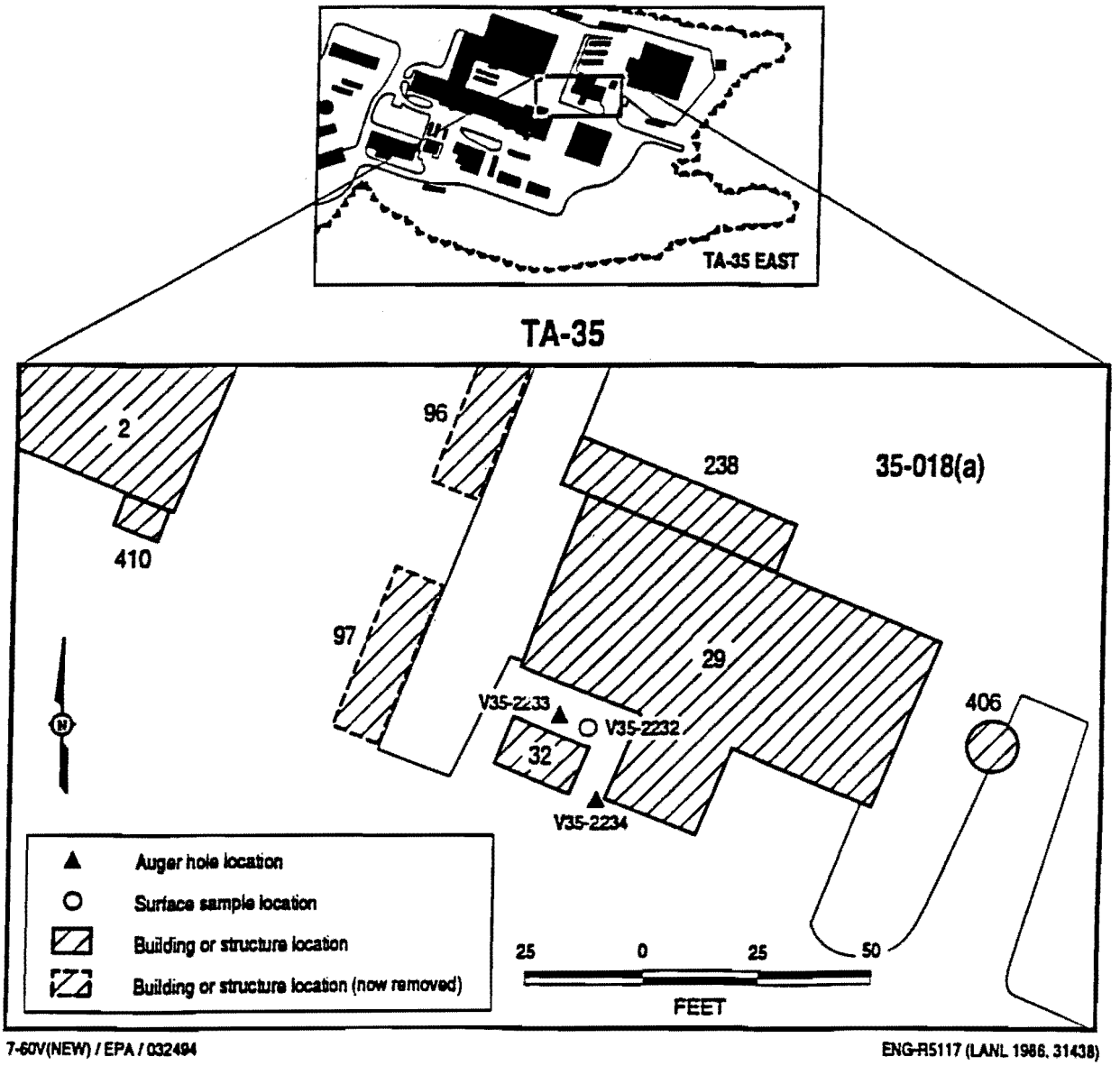


Figure 7-60. Schematic sample location map for SWMU No. 35-018(a), Aggregate V.

7.6 Waste Characterization Strategy Form

The waste to be generated by the VCA activities will be the PCB-contaminated soil and the associated PPE used during the VCA activities. The contaminated soil was sampled and analyzed as part of the RFI, and a waste profile form for the waste will be generated from the RFI data.

The approved Waste Characterization Strategy Form is attached.

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WASTE CHARACTERIZATION STRATEGY FORM
VCA for PRS 35-018(a)
Revision 2, May 1996

OU NUMBER	PRS/SWMU NUMBER	TITLE
1129	35-018(a)	PCB Transformer Sub-Station

Name: Leslie Sontag, FTL	**Date**: 4-5-1996
FPL: Allyn Pratt, EES-13	**WMC**: Deba Daymon/John Jones
Type of Activity: Voluntary Corrective Action	

Site Description:

Potential Release Site (PRS) 35-018(a), located with in Los Alamos National Laboratory (LANL) Technical Area (TA) 35, at Substation TA-35-32, near the southwest corner of building TA-35-29, and is the site were transformer No. 5024, containing poly-chlorinated biphenyls (PCB)-contaminated dielectric oil (greater than 500 ppm) was reported to be leaking during a transformer assessment survey in 1985. The site is part of Aggregate V, of Field Unit 4 and is located at the south eastern edge of TA-35, adjacent to Ten Site Canyon.

Phase I characterization confirmed the presence of PCBs above the LANL screening action level of 1 ppm. Samples were also analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and alpha, beta, gamma and tritium radiation. Five Phase I characterization samples collected within the boundary of the area to be remediated will be used for waste characterization. No VOCs were detected and no metals were detected above RCRA TC screening levels or LANL screening action levels (SALs). All five samples were found with SVOCs above SALs however no organic constituents are present above RCRA TC screening levels . Summaries of SVOC, VOC, PCB, and metals analytical results are attached. The highest tritium result was 1.58 pC/g (MDA = 0.30 pC/g). Gross results indicate no radioactivity above background levels.

Investigation or Remediation Waste Description and Volume Estimate:

Waste Types: The chemicals of concern (COCs) for this Voluntary Corrective Action are PCBs and SVOCs.

Waste Types/Volumes: Waste generated from remediation activities is expected to include: PCB contaminated soil (solid waste - 20 yd^3 [actual anticipated volume is approximately 6 yd^3]), and PPE and dry decon materials (solid waste - 1 55-gallon drum). Dry decontamination methods will be employed to avoid generation of decon water.

Waste Packaging: Roll-offs/B-25 boxes, 55 gallon drums, and/or 5 gallon DOT polyethylene drums.

Characterization Strategy:

Waste generated during the VCA will be characterized using the analytical data obtained to date from Phase I site characterization samples collected within the boundary of the area to be remediated. Five samples are adequate to be considered representative of the anticipated waste volume to be generated (6 yd^3). Soil suspected of containing PCBs will be segregated from other excavated soil. This site is considered to be an "old" PCB spill (the spill occurred prior to May 4, 1987).

Preliminary RCRA Determination:

☒ **No 90-day Storage Requirement (non-RCRA)**
Describe how waste will be stored/handled:

Waste suspected of containing PCBs will be placed in non-leaking containers (55-gal. drums or rolloffs/B-25 boxes), and as required by 40 CFR 761.65(c), for less than 30 days, posted with the date when the soil was excavated and placed in the container, and marked as specified in 40 CFR 761.45(a) Figure 1. All waste will be managed in a protective manner, within the boundary of the PRS as described in the Environmental Restoration Administrative Procedure 5.03, LANL-ER-AP-5.03, Management of Environmental Restoration Program Wastes.

Waste suspected of being contaminated with radioactivity (not anticipated) will be posted as Potentially Radioactive Waste and segregated from non-radioactive wastes.

☐ **90-Day Storage Requirement (RCRA)**

Analyte Suite:

Analyte Category	Analytical Method	Direct Sampling of Containerized Waste	Acceptable Knowledge: Existing Information Present *	Acceptable Knowledge: Existing Information Absent	Acceptable Knowledge: Data from Site Characterization
Total Metals	n/a	☐	☐	☒	☐
Volatile Compounds	n/a	☐	☐	☒	☐
Semi-Volatile Compounds	n/a	☐	☒	☐	☐
Organochlorine Pesticides and PCBs	EQ 430	☐	☒	☐	☐
High Explosive Compounds	n/a	☐	☐	☒	☐
Gross Alpha	Gross α	☐	☐	☒	☐
Gross Beta	Gross β	☐	☐	☒	☐
Gross Gamma	Gross δ	☐	☐	☒	☐
Tritium	Liq. Scint.	☐	☐	☒	☐
Asbestos	n/a	☐	☐	☒	☐
TCLP **	n/a				
Metals		☐	☐	☒	☐
Organics		☐	☐	☒	☐
Inorganics		☐	☐	☒	☐
Pesticides, herbicides, fungicides		☐	☐	☒	☐

* Existing information is based on Phase I site characterization results.
**TCLP analyses were not conducted. Samples were analyzed for total concentrations.

Signatures:

Dela Daymr

ER Waste Management Representative

Mary Jane Wind

CST Representative 5/13/96

Janet M Jacobson

Form Author

7.7 VCA Checklist and Field Work Authorization Form

The approved Voluntary Corrective Action (VCA) Checklist and Field Work Authorization Form is attached.

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Voluntary Corrective Action (VCA)
Checklist and Field Work Authorization Form

PRS No. 35-018(a) **HSWA or AOC**

__√__ COPC(s) defined.

__√__ Nature and extent Defined or field screening method available to guide where not defined.

__√__ Remedy is obvious.

__√__ Time for removal is less than 6 months.

__√__ Remedy is final.

__√__ Land use assumptions straightforward.

__√__ Treatment, Storage, Disposal Facilities are available for waste type and volume.

__√__ Cleanup cost is reasonable for the planned action, and meets accelerated decision logic criterion for decision to proceed with VCA.

Explain criteria not checked above. _____

Through reviewing the above criteria associated with this site, I believe that a VCA is the appropriate Accelerated Cleanup approach

Allyn Pratt, ~~FU-4~~, FPL — Date 3/18/96

Bob Simeone, FPC — Date 3/27/96

The undersigned have reviewed the final plan and believe that it fully satisfies the appropriate Accelerated Cleanup approach.

Allyn Pratt, ~~FU-4~~, FPL — Date 3/18/96

Bob Simeone, FPC — Date ~~3/27/96~~ 5/15/96

Through reviewing the VCA Plan, for site PRS No. 35-018(a), and believing that the above criteria have been met, I authorize the fieldwork to proceed.

DOE ER Program Manager — Date 6/11/96

7.8 Cost Estimate

Table 7.8-1 shows the estimated cost for completing the VCA activities.

TABLE 7.8-1

ESTIMATED COST WORKSHEET

Category	Rate	Units	Cost
Field Preparation Activities			
VCA plan preparation	$700/day	12 days	$8,400
VCA plan technical edit and review	$700/day	3 days	$2,100
Preparation of waste characterization form	$700/day	1 day	$700
Preparation of Stormwater Pollution Prevention Plan	$700/day	1 day	$700
Preparation of Spill Prevention, Control, and Countermeasures Plan	$700/day	1 day	$700
Preparation of site-specific health and safety plan	$700/day	4 days	$2,800
Subtotal			**$15,400**
Field Activities			
Field unit oversight and sampling (field team leader, site safety officer)	$500/day	5 days	$2,500
Subcontractor (excavation and site restoration)	$1,000/day	5 days	$5,000
Waste containers (B-25)	$1,100/each	2 containers	$2,200
Subcontractor (disposal of solid waste)	$160/ton	8 tons	$1,300
Subcontractor (transportation of waste)	$4,200/trip	1 trip	$4,200
Subtotal			**$15,200**
Analytical Costs			
Radiological van (gross I, J, K screening for waste characterization) (split cost)	$1,000/day	2 days	$2,000
Field screen PCBs	$32/sample	20 samples	$640
Lab gamma spectroscopy	$190/sample	5 samples	$950
Metals	$415/sample	5 samples	$2,075
Lab pesticides/PCBs	$300/sample	9 samples	$2,700
Lab SVOCs	$586/sample	9 samples	$5,275
Subtotal			**$13,640**
Final Activities			
Acceptance inspection	$500/day	1 day	$500
Final report preparation	$700/day	10 days	$7,000
Final report technical edit and review	$700/day	2 days	$1,400
Subtotal			**$8,900**
Total Estimated Cost			**$53,140**

8.0 REFERENCES

Environmental Restoration Decision Support Council, January 2, 1996. "Risk-Based Corrective Action Process," Los Alamos National Laboratory Report LA-UR-96-111, Los Alamos, New Mexico. **(Environmental Restoration Decision Support Council 1996, ER ID Number 53751)**

EPA (US Environmental Protection Agency), November 1986. "Test Methods for Evaluating Solid Waste, Volume IB: Laboratory Manual, Physical/Chemical Methods," SW-846, Third Edition, Washington, DC. **(EPA 1986, ER ID Number 31733)**

EPA (US Environmental Protection Agency), April 10, 1990. Module VIII of RCRA Permit No. NM0890010515, EPA Region VI, issued to Los Alamos National Laboratory, Los Alamos, New Mexico, effective May 23, 1990, EPA Region VI, Hazardous Waste Management Division, Dallas, Texas. **(EPA 1990, ER ID Number 1585)**

EPA (US Environmental Protection Agency), September 1, 1995. "Region IX Preliminary Remediation Goals (PRGs) Second Half 1995," EPA Region IX, Technical Support Section, San Francisco, California. **(EPA 1995, ER ID Number 53970)**

Jacobson, J., April 8, 1996. "Site walk over for surface water concerns," Daily Activity Log, Los Alamos, New Mexico. **(Jacobson 1996, ER ID Number 54195)**

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. I—IV, Los Alamos National Laboratory Report LA-UR-90-3400, prepared by International Technology Corporation, Contract No. 9-XS8-0062R-1, Los Alamos, New Mexico. **(LANL 1990, ER ID Number 7511)**

LANL (Los Alamos National Laboratory), May 1991. "Environmental Restoration Standard Operating Procedures," Vol. I–III, Los Alamos, New Mexico. **(LANL 1991, ER ID Number 21556)**

LANL (Los Alamos National Laboratory), March 1992. "Administrative and Quality Procedures for Environmental Restoration," Los Alamos, New Mexico. **(LANL 1992, ER ID Number 11686)**

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1129," Los Alamos National Laboratory Report LA-UR-92-800, Los Alamos, New Mexico. **(LANL 1992, ER ID Number 7666)**

LANL (Los Alamos National Laboratory) 1994. "Site Development Plan, Annual Update 1994," Los Alamos National Laboratory Publication LALP-94-21, Los Alamos, New Mexico. **(LANL 1994, ER ID Number 53451)**

LANL (Los Alamos National Laboratory), July 1995. "Statement of Work—Analytical Support," Revision 2, RFP No. 9-XS1-Q4257, Los Alamos, New Mexico. **(LANL 1995, ER ID Number 49738)**

LANL (Los Alamos National Laboratory), 1996. "Reconsidering and/or Stopping Work on Expedited Cleanups (ECs)/Voluntary Corrective Actions (VCAs)" (draft), in *ER Project Workshop, Sampling and Analysis Plans*, Los Alamos, New Mexico. **(LANL 1996, ER ID Number 52950)**

LANL (Los Alamos National Laboratory), March 1996. "Quality Assurance Project Plan Requirements for Sampling and Analysis," Los Alamos National Laboratory Report LA-UR-96-441, Los Alamos, New

Mexico. **(LANL 1996, ER ID Number 53450)**

Pratt, A., June 2, 1994. "Addendum to the OU 1129 RFI Work Plan," Los Alamos National Laboratory Memorandum EES-13-ER-05-94-011 to Tracy Glatzmaier (EES-5) from Allyn Pratt (EES-13), Los Alamos, New Mexico. **(Pratt 1994, ER ID Number 43475)**

Roberson, K., August 21, 1991. Notes recorded during site inspection of TA-35 (east end) on International Technology (IT) Corporation Meeting Log, Los Alamos, New Mexico. **(Roberson 1991, ER ID Number 21578)**

9.0 ATTACHMENTS

The following field forms (that are not included in SOPs) used to execute the SAP are attached to this VCA plan.

- ESH-1 Direct Survey Form
- ESH-1 LAS Survey Form (LAS = large area swipe)
- ESH-1 Smear Survey From
- ESH-1 Smear Continuation Form
- FU 04 Equipment and Item Removal Log
- FU 04 Site Access List
- FU 04 Survey Form
- FU 04 Tailgate Safety Meeting Form

ESH-1 DIRECT SURVEY FORM

SAMPLE DESCRIPTION

Sample Date/Time: _____ No. Of Samples: _____

TA: _____ Bldg: _____

RCT: _____ Z Number: _____

Phone/Fax: _____

SAMPLE TRACKING NUMBER

PURPOSE OF SURVEY

☐ ROUTINE ☐ PRE-JOB ☐ POST-JOB ☐ HOT-JOB

☐ ITEM RELEASE ☐ OFFSITE SHIPMENT ☐ ONSITE SHIPMENT

☐ NON-ROUTINE/OTHER: _____

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF

ADDITIONAL INFORMATION

☐ Occurrence No.: _____

☐ Incident No.: _____

☐ RWP No.: _____

Item/Area	Alpha		Beta/Gamma		Remarks
	cpm	dpm	cpm	dpm	

ESH-1 LAS SURVEY FORM

SAMPLE DESCRIPTION

Sample Date/Time: _____ No. Of Samples: _____

TA: _____ Bldg: _____

RCT: _____ Z Number: _____

Phone/Fax: _____

SAMPLE TRACKING NUMBER

PURPOSE OF SURVEY

☐ ROUTINE ☐ PRE-JOB ☐ POST-JOB ☐ HOT-JOB

☐ ITEM RELEASE ☐ OFFSITE SHIPMENT ☐ ONSITE SHIPMENT

☐ NON-ROUTINE/OTHER: _____

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF	BI

ADDITIONAL INFORMATION

☐ Occurrence No.: _____

☐ Incident No.: _____

☐ RWP No.: _____

Item/Area	Alpha		Beta/Gamma		Remarks
	cpm	dpm	cpm	dpm	

ESH-1 SMEAR SURVEY FORM

SAMPLE DESCRIPTION

Sample Date/Time: _____ No. Of Samples: _____

TA: _____ Bldg: _____

RCT: _____ Z Number: _____

Phone/Fax: _____

SAMPLE TRACKING NUMBER

PURPOSE OF SURVEY

☐ ROUTINE ☐ PRE-JOB ☐ POST-JOB ☐ HOT-JOB

☐ ITEM RELEASE ☐ OFFSITE SHIPMENT ☐ ONSITE SHIPMENT

☐ NON-ROUTINE/OTHER: _____

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF

ADDITIONAL INFORMATION

☐ Occurrence No.: _____

☐ Incident No.: _____

☐ RWP No.: _____

Smear No.	Location	Alpha*	Beta*	Gamma*

Smear No.	Location	Alpha*	Beta*	G

*dpm/100 cm2

ESH-1 SMEAR CONTINUATION FORM

Smear No.	Location	Alpha*	Beta*	Gamma*	Smear No.	Location	Alpha*	Beta*	Gamma*

FU 04 EQUIPMENT AND ITEM REMOVAL LOG[a]

Survey Instrument	Smear Counter	Facility
HS Property Number	HS Property Number	
Calibration Due Date	Calibration Due Date	

			Exterior Survey		Interior Monitoring[b]				
Date	RCT: Enter name (print), signature, and Z #	Item Part Number and Description	Direct Survey (dpm/100cm^2)	Smear Survey (dpm/100cm^2)	Required? Yes/No	Direct Survey (dpm/100cm^2)	Smear Survey (dpm/100cm^2)	Responsible Person: Enter name (print), signature, Z #, and organization phone	Comments Write additional comments on back

a Item cannot be released unless survey results are below *LANL Radiological Control Manual* Table 2-2 limits for conditional release and below detectable activity for unconditional release (release to the general public).

b Disassembly and interior monitoring is required unless responsible person verifies by his/her signature that internal contamination is not possible, based upon knowledge of process and previous use.

FU 04 Site Access List

TA _____ Site Work Plan _____ Date _____ / _____ / _____

Page _____ of _____

Badge Z No.	Name	Group	Training	Task	Time Arrived onsite	Time Enter:Exit Zone (Exclusion)				Time Depart Site	Total time Onsite	PPE Level	Time in Exclusion Zone	Signature
111270	Butler, Nancy	ESH-5	24 hr HW	H&S Rep.										
117207	Daymon, Debe	ERM	40 hr HW	Field Team Mgr										
083071	Hutton, Rick	SAIC	40 hr HW	Field Support										
115401	Harris, Jenny	ERM	40 hr HW	Field Tech										
117228	Hayes, John	ERM	40 hr HW	H&S, SSO										
114816	Koch, Richard	SAIC	40 hr HW	Geologist										
099718	Pratt, Allyn	EES-13	40 hr HW: 8 hr Sup	Manager										
108821	Peifer, Marty	ESH-1	40 hr HW	H&S-RCT Supp										
099070	Romero, Carmella	SAIC	40 hr HW: 8 hr Sup	Site Smpl Coord										
117380	Sontag, Leslie	SAIC	40 hr HW: 8 hr Sup	FTL										
013418	Stafford, David	SAIC	40 hr HW: 8 hr Sup	Sample Tech										

03: 2/1/96

FU 04 SURVEY FORM

Item Surveyed: _____ **Page** _____ **of** _____ **Date:** ____ / ____ / ____

Site: _____	α Direct	β/γ Direct	α Removable:	β/γ Removable
RCT/RSP: _____	Ratemeter: _____	Ratemeter: _____	Ratemeter: _____	Ratemeter: _____
Name: _____	Probe: _____	Probe: _____	Probe: _____	Probe: _____
Signature: _____	Cal. Due Date: _____	Cal. Due Date: _____	Cal. Due Date: _____	Cal. Due Date: _____
Comments:	HSE #: _____	HSE #: _____	HSE #: _____	HSE #: _____
	Bkgd: _____cpm Eff: ____%	Bkgd: _____cpm Eff: ____%	Bkgd: _____cpm Eff: ____%	Bkgd: _____cpm Eff: ____%
	MDA: _____	MDA: _____	MDA: _____	MDA: _____

Item Survey	Direct Alpha		Direct Beta/Gamma		Removable Alpha		Removable Beta/Gamma		Dose Rate	Comments
	cpm	dpm/100cm^2	cpm	dpm/100cm^2	cpm	dpm/100cm^2	cpm	dpm/100cm^2	micro-R/hr	

MDC (Ratemeter) = 3σ (units cpm)
MDC (Ratemeter) = MDC/Efficiency × probe correction
MDA (Scaler) = $[2.71 + (4.65 \cdot (b^{\circ} \cdot t_S)^{0.5})]/(Eff \cdot t_S)$
t_S = Sample Count Rate
b° Background Count Rate

$$\sigma = [0.25 \times (\Sigma(B_i - B)^2)]^{1/2} \text{(units cpm)}$$
$$i = 1$$

B_i = individual background count reading
B = the mean or average of 5 different background count readings from different areas

Probe type	Correction Factor:
β/γ Ludlum GM Pancake probe	100/15 5(cm^2/cm^2)
α Ludlum GM Pancake probe	100/75 cm^2/cm^2)
α Eberline AC-3 (Zns) probe	100/59 cm^2/cm^2)

FU 04 SURVEY FORM (Continued)

Item Surveyed: _____ **Page** _____ **of** _____ **Date:** _____ / _____ / _____

RCT: _____

Signature: _____

Item Survey	Direct Alpha		Direct Beta/Gamma		Removable Alpha		Removable Beta/Gamma		Dose Rate	Comments
	cpm	dpm/100cm^2	cpm	dpm/100cm^2	cpm	dpm/100cm^2	cpm	dpm/100cm^2	micro-R/hr	

MDC (Ratemeter) = 3σ (units cpm)
MDC (Ratemeter) = MDC/Efficiency × probe correction
MDA (Scaler) = $[2.71 + (4.65 \cdot (b^{\circ} \cdot t_S)^{0.5})]/(Eff \cdot t_S)$
t_S = Sample Count Rate
b° Background Count Rate

$$\sigma = [0.25 \times (\Sigma(B_i - B)^2)]^{1/2} \text{(units cpm)}$$
$$i = 1 \quad n$$

B_i = individual background count reading
B = the mean or average of 5 different background count readings from different areas

Probe type	Correction Factor:
β/γ Ludlum GM Pancake probe	100/15 5(cm^2/cm^2)
α Ludlum GM Pancake probe	100/75 cm^2/cm^2)
α Eberline AC-3 (Zns) probe	100/59 cm^2/cm^2)

FU 04 TAILGATE SAFETY MEETING

OU _____ TA _____ SSHASP No. _____ Date ____ / ____ / ____

Site Work Plan _____

SAFETY TOPICS PRESENTED

SUBJECTS DISCUSSED (Including Change Orders)

_____

_____

_____

HAZARDS: _____

_____

Biological (Site/Operational) _____

_____

Chemical _____

_____

Physical _____

_____

Radiological _____

_____

HAZARD CONTROL MEASURES:

Personal Protective Equipment _____

_____

Engineering/Administrative Control _____

_____

Monitoring(IH/HP) _____

_____

Special Equipment _____

_____

EMERGENCY ACTIONS:

_____

_____

_____

_____

_____

_____

MEETING ATTENDEES

PRINT NAME/ORGANIZATION	Z #	SIGNATURE

Meeting Conducted By: ______________________ ______________________

(Print Name) (Title) (Signature)