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Date: April 4, 1996
Refer to: EM/ER:96-173

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: FINAL VOLUNTARY CORRECTIVE ACTION (VCA) PLAN FOR ACTIVITIES AT TECHNICAL AREA (TA) 35 FOR POTENTIAL RELEASE SITE (PRS) 35-003(a,b,c, and n)

Dear Mr. Garcia:

Enclosed please find an informational copy of the final VCA Plan for activities in TA-35 for PRS 35-003(a,b,c, and n) to be completed in Fiscal Year 1996.

The Department of Energy (DOE) participated in developing and reviewing this plan. The VCA Checklist and Field Authorization Form have been completed and signed. DOE authorization for field work to proceed has been granted and is included with the enclosed plan.

If you have any questions, please call Allyn Pratt at 505-667-4308 or Bob Simeone at 505-667-0587.

Sincerely,

Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,

Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/bp

Enclosure: Final VCA Plan for TA-35 for PRS 35-003(a,b,c, and n)
VCA Checklist and Field Authorization Form

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Voluntary Corrective Action Plan for

Potential Release Sites

35-003(a)
35-003(b)
35-003(c)
35-003(n)

Phase Separator Pit and Underground Storage Tanks

Field Unit 4

Environmental Restoration Project

March 1996

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-96-1149

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1.0 INTRODUCTION

1.1 Site Type and Description

Potential Release Site (PRS) Nos. 35-003(a, b, c, and n) are the sites of the phase separator pit (structure No. TA-35-3) and the three associated underground storage tanks (structure Nos. TA-35-4, -5, and -6), which are located between buildings TA-35-2 and TA-35-7 near the east end of Technical Area (TA)-35. The sites are located near the east end of Ten Site Mesa in a highly industrialized area of Los Alamos National Laboratory (the Laboratory). These PRSs, associated with former Operable Unit 1129, are managed by Field Unit 4 of the Laboratory Environmental Restoration (ER) Project. The locations of the PRSs are shown on the site map (Figure 1).

These structures will be decommissioned by the TA-35 Decommissioning Project (formerly called the D&D Project) in 1996. This voluntary corrective action (VCA) plan contains the sampling and analysis plan (SAP) for the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) site investigations, the decision logic for implementing the SAPs, and the plan for performing any additional cleanup that may be required after the sites have been decommissioned.

The phase separator pit (PRS No. 35-003[n]) is a large, subterranean, reinforced concrete structure that housed equipment used to treat vented air exhaust from laboratory hoods in building TA-35-2. The phase separator pit is about 90 ft long and 20 ft wide; the top of the pit is located at approximately ground level. The structure housed air vent lines, air filters, phase separator chambers, liquid drain lines, and a caustic treatment tank. The floor of the phase separator pit slopes to the north to drain liquids into sumps located at the north end of the pit. The floor of the pit is about 12 ft below ground level except at the north end where a deeper pit housed the caustic treatment tank, which is about 22 ft below ground level. Another sump at the northeast corner of the caustic treatment tank drained the caustic treatment area.

The three underground stainless steel storage tanks (PRS Nos. 35-003[a, b, and c]) were connected to the phase separator pit and were used to retain waste liquids before treatment and discharge to the large waste holding tanks (former structure TA-35-10). Each storage tank has a 600-gal. capacity; the tops of the tanks are located just below the floor level of the phase separator pit. The sites are not located in a known water course.

1.1.1 Operational History

The phase separator pit and the underground storage tanks were part of the TA-35 wastewater treatment plant that operated from 1951 until 1963. The treatment plant received and processed air and liquid wastes from radiochemistry laboratories and operations of the radioactive ^{140}La hot cells in building TA-35-2. The exhaust from laboratory hoods was routed to the phase separator pit, and liquid wastes were stored in the three underground storage tanks. The liquid waste was caustic- treated for acidity in the tanks and was then routed to the large former concrete holding tanks (TA-35-10) at the east end of TA-35.

In 1963 a new wastewater treatment plant became operational at TA-50. Most of the TA-35 wastewater treatment plant was decommissioned and decontaminated in 1980 and 1981 and again in 1985, but the phase separator pit and the associated storage tanks were left in place. Additional details of the previous decommissioning operations

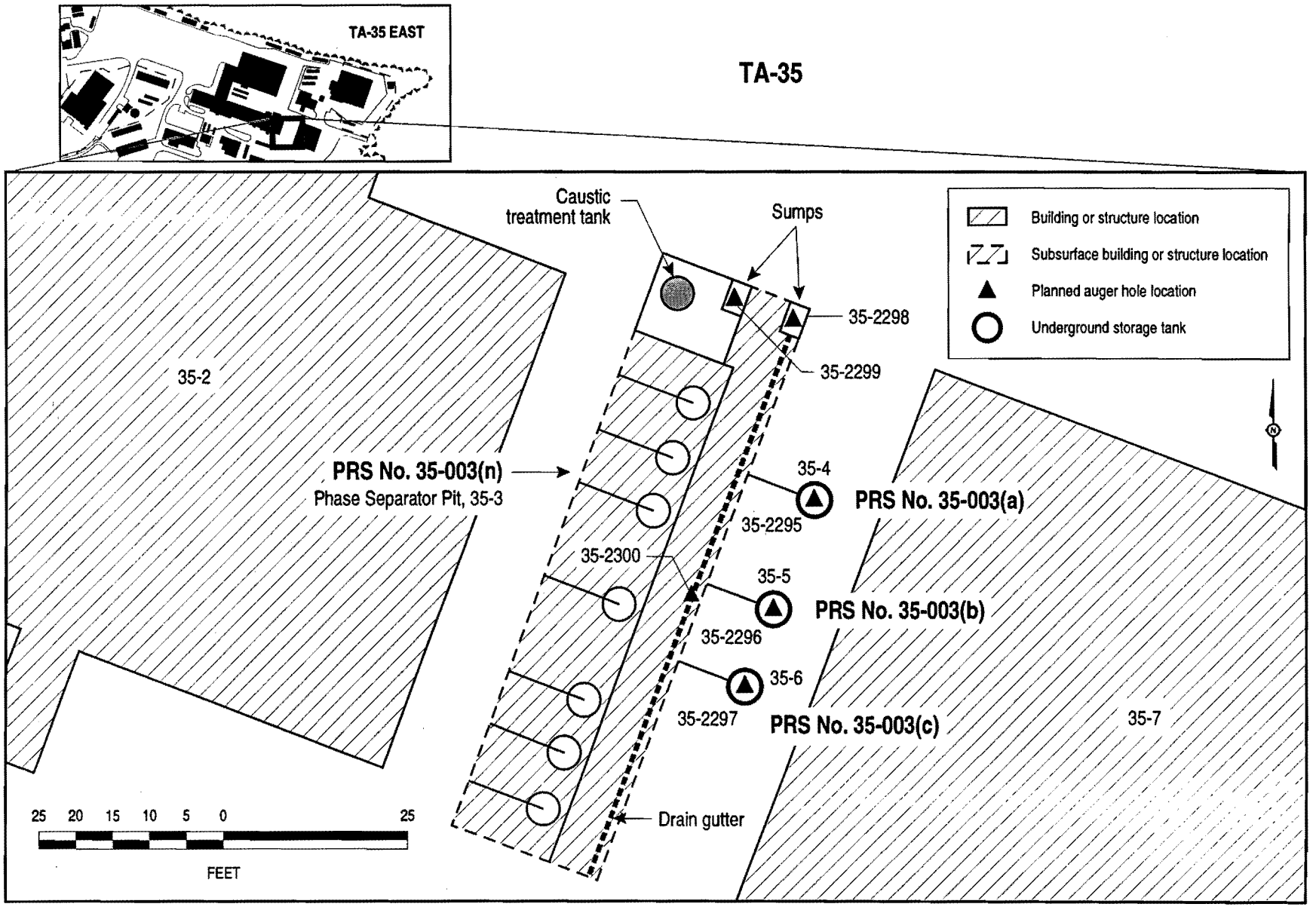

Figure 1. Schematic location map of PRS Nos. 35-003(a, b, c, and n).

at TA-35 are located in Section 3.3.2.4 of the RFI Work Plan *for Operable Unit 1129* (LANL 1992, 7666) and in a report by Elder et al. (1986, 3089).

1.1.2 TA-35 Decommissioning Project Activities

The current TA-35 Decommissioning Project activities are described in *TA-35 D&D Project: Implementing Plans for support of Phase I Decommissioning Activities* (LANL 1995, 53455). The TA-35 Decommissioning Project will use radiometric screening at the site to determine the extent of remediation. Instruments that detect alpha and beta-gamma radiation will be used to screen the soil that is in contact with pipelines, the tanks, and the structures that are removed during decommissioning. If radioactive contamination of the soil is detected, the TA-35 Decommissioning Project will remove up to 2 ft of soil from beneath the removed structures. This VCA plan is designed to identify the chemicals of potential concern (COPCs) at the site and, if contamination remains after decommissioning, to provide a plan for additional remediation.

1.1.3 COPCs and Rationale for Proposed Remedial Action

Radioisotopes are the probable contaminants in the waste associated with PRS Nos. 35-003(a, b, c, and n). The radioactivity may be from ^{140}La, ^{90}Sr, ^{90}Y, and traces of other isotopes, including ^{137}Cs and ^{106}Ru (Emelity 1958, 794). Records that provide evidence of the use of hazardous materials have not been located.

RFI soil sampling has not been performed to identify COPCs at the site. Soil sampling, as described in the SAP in Section 5.0, will identify the nature and extent of contamination and guide the VCA. Analytes that will be addressed in the SAP are those that were associated with the wastewater treatment plant and include gross-alpha, -beta, and -gamma radiation; tritium; metals; volatile organic compounds (VOCs); and semivolatile organic compounds (SVOCs). Radionuclides have been identified by decommissioning sampling in the soil adjacent to the phase separator pit.

If COPCs remain at the site after decommissioning excavation and removal of the structures, the most cost-effective approach would be to perform any necessary cleanup associated with the VCA before the final decommissioning backfilling and recontouring of the site. Using this rationale, it will be necessary to perform the characterization sampling after decommissioning and, if needed, immediately perform the remedial action described in Section 3.0 within the time period allowed for the decommissioning activities. To the extent possible, the existing decommissioning contractor will be used to perform the VCA.

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2.0 SITE CHARACTERIZATION

2.1 RFI Information and Other Decision Data

There are no RFI data for PRS Nos. 35-003(a, b, c, and n). A SAP was submitted to the Environmental Protection Agency (EPA) in the *RFI Work Plan for Operable Unit 1129* (LANL 1992, 7666). The SAP was noted to be deficient during the EPA review of the work plan. The final comment response to the work plan notice of deficiency was sent to EPA September 30, 1993. At that time Operable Unit 1129 personnel requested a delay of the formal SAP transmittal so that the RFI investigation could be performed in conjunction with decommissioning of the structures associated with these PRSs.

During the decommissioning project in the 1980s, radiological surveys of the phase separator pit area showed radioactive contamination with activities up to 2,000 dpm/ 60 cm2. Additional surveys in 1990 detected activities as high as 10,000 dpm/60cm^2 (LANL 1995, 53455).

Soil samples were collected by the TA-35 Decommissioning Project in 1993 before beginning the decommissioning activities. Three borehole samples were located near the phase separator pit to expedite waste handling activities. The soil samples were analyzed for VOCs; SVOCs; metals; and gross-alpha, -beta, and -gamma radiation (LANL 1995, 53455). However, many of these results are not yet available at the time of the preparation of this VCA plan and SAP. A summary table of available results above Laboratory screening action levels (SALs) from preliminary decommissioning sampling is presented in Section 7.2. Results indicated the presence of various radionuclides, including tritium, that are above background and/or SALs. VOC concentration values were less than SALs, but they may be of concern for waste management purposes. The only sample with detectable VOCs was the sample collected from tank 35-5 (PRS No. 35-003[b]). Several VOCs were detected in the sample taken from that tank. The constituents present were 1,1-dichloroethene (112,000 µg/L), carbon tetrachloride (153,000 µg/L), and 1,2-dichloroethane (2,600 µg/L) (LANL 1995, 53455).

Decommissioning activities planned for 1996 will remove the phase separator pit and the three storage tanks. The decommissioning activities are planned to include the removal of up to 2 ft of soil beneath the structures if gross-gamma soil contamination is detected by field screening. Site surveys will be performed and soil samples will be collected after completing the excavation and removing the structures and before filling and grading the site. The surveys and samples will determine if COPCs remain following the decommissioning activities and, if appropriate, will confirm the effectiveness of the decommissioning cleanup activities, as described in the SAP in Section 5.0 and as shown in the decision logic diagram (Figure 2).

2.2 Nature and Extent of Contamination

The nature and extent of contamination within the VCA boundary area (described below) will be determined by the implementation of the SAP, as described in Section 5.0, and may be further defined during any remedial action, if required.

The planned VCA activity will be limited to the site of PRS Nos. 35-003(a, b, c, and n) between buildings TA-35-2 and TA-35-7 where decommissioning activities have taken place. Excavation of contaminated soil that remains after decommissioning activities have been completed in this area will be limited to a maximum depth of 5 ft below the level where decommissioning activities ceased. A depth of 5 ft was selected as the

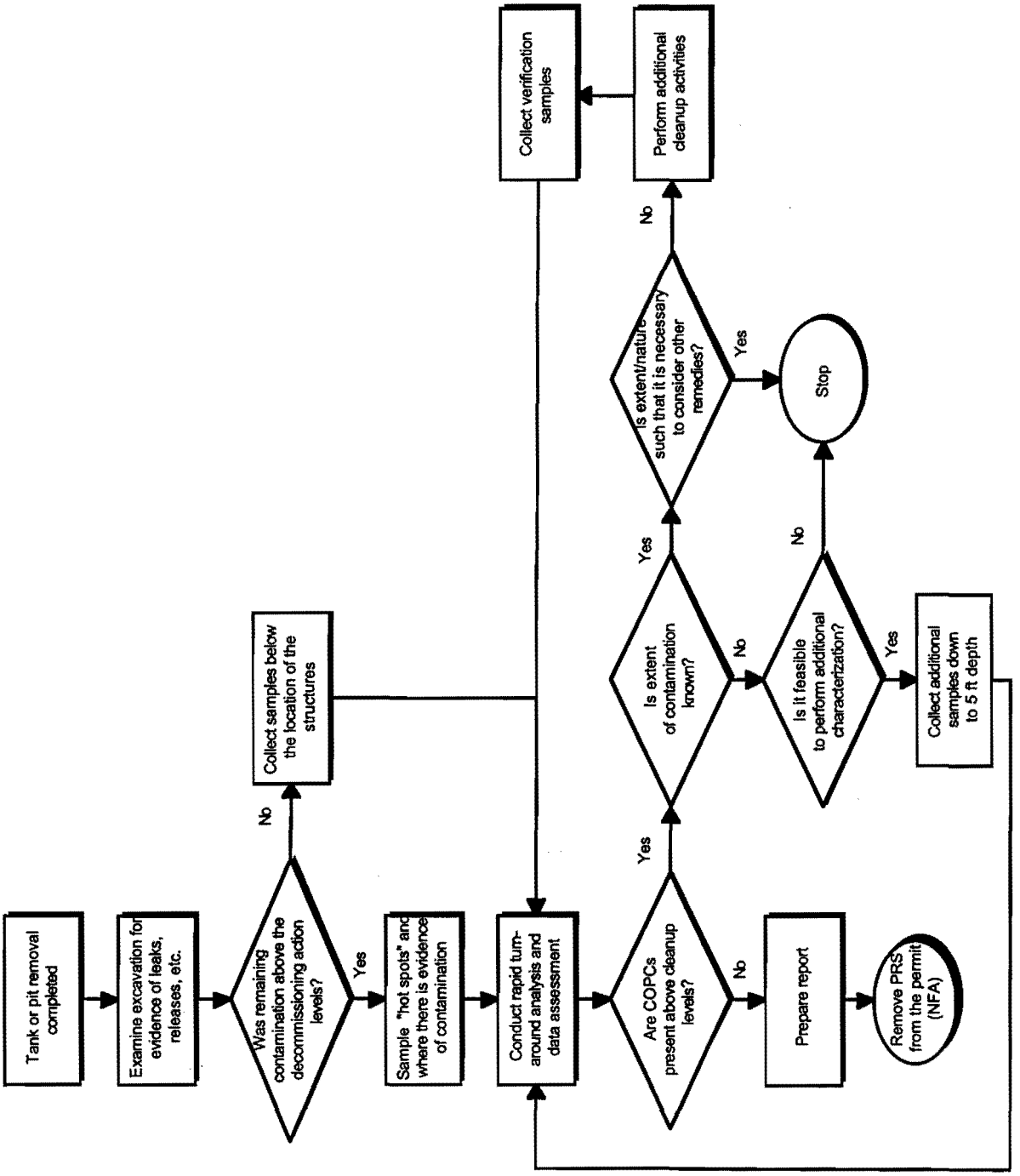

Figure 2. Logic diagram for VCA sampling activities at PRS Nos. 35-003(a, b, c, and n).

boundary for VCA activities based primarily on considerations of time and cost for completing the VCA. The choice of a 5-ft boundary on depth was also influenced by the fact that this site will be backfilled and recontoured to approximately the original surface elevations when the ER Project activities are completed. Because the TA-35 Decommissioning Project will excavate to at least the depths of the phase separator pit and the underground storage tanks (15 to 20 ft), an additional 5 ft of excavation during VCA activities will result in 20 to 25 ft of clean backfill material covering any contamination that remains below the phase separator pit or storage tanks after site closure.

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3.0 PROPOSED REMEDY

3.1 Description of the Proposed Remedial Action

A phased approach to the removal of contaminated soil material will be implemented for the VCA, as required by the results of the field investigation and described in the SAP. Field screening and soil sample analyses for the identified COPCs will be used to guide the removal of additional contaminated soil. 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. 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 or until the excavation reaches a depth of 5 ft.

The remedial action will proceed up to a maximum depth of 5 ft below the original decommissioning cleanup surface. If contamination is found to exist at depths greater than 5 ft, the VCA will be halted in accordance with the ER Project's "Stop Work" criteria (LANL 1996, 52950), and the requirements of the VCA plan will be reassessed.

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 of the verification samples are discussed in the SAP in Section 5.0.

3.2 Basis for Cleanup Levels

As described in Section 2.2, it is anticipated that 20 to 25 ft of clean backfill material will be placed in the excavations that result from the removal of the phase separator pit and the storage tanks. With the possible exception of VOCs, any contaminants remaining below this depth will have no impact on human receptors in either indoor or outdoor environments above the buried contamination. VOCs can migrate by diffusion from depth; therefore, they may present a risk without direct exposure to the contaminant source. If in the future a building is constructed on this site with subfloors or footings extending as far as 25 ft below grade, a risk to construction workers or building occupants from other types of contamination may also exist. However, costly activities to mitigate such potential problems are not practical until these activities are contemplated. Therefore, unless VOCs are identified above screening SALs at this site, cleanup levels for on-site exposure will not be calculated.

In addition to on-site human health concerns, contamination remaining 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 Nos. 35-003(a, b, c, and n).

Cleanup level calculations for VOCs identified during the soil sampling activities described in this VCA plan will be performed for exposure scenarios consistent with continued Laboratory operations. PRS Nos. 35-003(a, b, c, and n) are located within Department of Energy (DOE) -owned land on a developed mesa top; it is anticipated

that the area will continue to be used exclusively for Laboratory (industrial) operations in the foreseeable future (LANL 1994, 53451). The most likely exposure scenario for which such cleanup levels would be calculated is a long-term employee scenario. Cleanup levels for carcinogenic VOCs would be calculated using a target risk range of 10^{-4} to 10^{-6} for lifetime incremental cancer risk. Cleanup levels for noncarcinogenic VOCs would be calculated using a hazard quotient of one.

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 as described in the TA-35 Decommissioning Project implementing plan (LANL 1995, 53455). Soil material used to backfill the site will consist of clean soil fill material obtained from the Laboratory's maintenance contractor, Johnson Controls World Services, Inc.

4.0 WASTE MANAGEMENT

4.1 Estimated Waste

Table 1 lists the estimated types and volumes of waste that will be generated during VCA activities.

TABLE 1

ESTIMATED WASTE FOR PRS NOs. 35-003(a, b, c, and n)

Item	Waste Type	Anticipated Volume
Personal protective equipment	Solid	< 1 55-gal. drum
Soil	Solid	To be determined
Decontamination water	Liquid	< 1 55-gal. drum

4.2 Method of Management and Disposal

During remedial actions, any waste generated from the VCA activities will be stored within the boundary of that PRS in a protective manner as described in the TA-35 Decommissioning Project waste management plan (LANL 1993, 23256) and as guided by the ER Project "Draft: Project Consistency Team (PCT) Policy Memo on Management of Investigation Derived Waste (IDW)" (PCT 1995, 46200) and the ER Project administrative procedure LANL-ER-AP-05.3, R0, "Management of Environmental Restoration Wastes" (LANL 1992, 11686). Waste containers will be sampled and analyzed for disposal characterization purposes as specified in the waste management plan and disposed of accordingly.

Final disposition of waste will be determined by the type of waste that is removed, in cooperation with the Laboratory group CST-5.

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5.0 SAMPLING AND ANALYSIS PLAN

5.1 Problem Definition

The following questions and concerns will be answered by measurements taken during the execution of this SAP.

1. What constituents have been released from the phase separator pit and storage tanks to the surrounding environment? Which of these constituents are potentially present in environmental media at concentrations above cleanup levels or other levels of concern, as defined below?

2. Is the extent of additional contamination such that a final remedy can be completed at this time, or will it be necessary to consider alternative remedies?

3. How much additional material should be removed from the decommissioning excavation before backfilling and from where? (A limited amount of additional material may be removed even if it has been determined that a final remedy is not possible at this time.)

4. If the VCA can be completed, this investigation will provide sufficient data to verify its completion.

The site and the available data have been summarized in Sections 1.0 and 2.0. This investigation will be guided by the following drivers.

1. Cleanup levels will be calculated for VOCs present above screening levels, as discussed in Section 3.2. Because any remaining contamination will ultimately be covered with 20 to 25 ft of backfill material, onsite exposure pathways are not complete for any other class of contaminants.

2. If other chemical contaminants are detected at the site, the decision to remove these contaminants will be based on the amount of contamination present, the cost and time required to complete the removal, and an evaluation of the environmental mobility of the contaminants. Radiological "hot spots" will be removed based on requirements of the Decommissioning Project and as guided by the "as low as reasonably achievable" (ALARA) principle.

3. If the release extends to depths greater than 5 ft below the level of the original excavation, New Mexico ground water regulations may apply. In this case, other remediation goals may have to be identified for constituents that cannot be removed.

5.2 SAP Design

5.2.1 Preliminary Observations

Preliminary observations will be carried out during decommissioning of the PRSs. These observations include the following.

- Analysis of a small number of samples from "hot spots" identified during decommissioning excavation of the structures. Note: Additional measurements may be available from samples collected during decommissioning of the liquid waste lines (PRS No. 35-003[misc]) following the previously approved work plan (LANL 1992, 7666).

- Visual inspection of the three storage tanks and the phase separator pit before and/or during their removal to identify leak points or flaws in these structures that might have served as pathways to the surrounding environment.

- Survey of the locations of the storage tanks, the phase separator pit (in particular, the gutter and the two sumps), and connecting piping (outside the pit).

- Radiological survey of areas where decommissioning identifies environmental releases above decommissioning criteria (which will be based on beta and gamma field radiation measurements) and subsequent decommissioning removal of additional soil, fill material, or tuff.

These observations will be used to bias sampling for this investigation and to provide a preliminary list of COPCs.

5.2.2 Identification of COPCs and Evaluation of Field Screening Methods

The goal of the initial phase of the investigation will be to identify COPCs at the site. Samples will be collected from the material beneath the storage tanks when each tank is removed; samples will be collected from the phase separator pit as the decommissioning of the floor of the pit progresses. In each case, samples will be collected after the decommissioning excavation and possible soil removal (up to 2 ft below the structures) is completed, as required by beta and gamma radiation-based decommissioning criteria. The analytical results of the initial sampling will provide data with which to address question 1 in Section 5.1. These samples will also be used to evaluate potential field screening methods for use in later phases of the investigation.

A radiation survey will be conducted in the excavation area to the extent permitted by site conditions.

A minimum of six soil samples will be collected from the exposed surficial material, assuming that the material is sand, soil, or tuff. However, if the surficial material is coarse gravel or cobble, the samples may be collected from underlying tuff. These samples are intended to represent the postdecommissioning exposed surface material most likely to have been contaminated by leaks.

Where each surface sample is collected, an additional subsurface sample will be collected by augering into tuff to a depth of 36 in. The auger holes may be moved 1 or 2 ft if field observation identifies a fracture in the tuff that might have channeled a liquid release from this point. The subsurface soil samples may represent material that would be removed during the VCA if contaminants are present or would be used to verify that no releases have occurred if contaminants are not present.

The six samples will include the following (see Figure 1).

- One soil sample from beneath each of the three removed storage tanks. If indications of releases have been observed (such as corrosion or discoloration of the tanks or connecting joints or elevated radiation measurements) the exact location of these samples will be biased accordingly. Otherwise, the samples will be collected directly below the tanks (all connections were made at the top of the tanks).

- One soil sample from beneath each of the two sumps in the phase separator pit. These sumps were the low points in the pit, into which any liquid released from the storage tanks or piping within the pit should have flown.

- One soil sample from beneath the main part of the phase separator pit. This sample location will be selected after investigating the site and will be biased toward areas where potential contamination would likely occur. Special consideration will be given to obvious fractures or staining of the surface, if present. In the absence of any such biasing information, this sample may be located in the southern part of the phase separator pit near the drain gutter.

Additional samples will be collected if additional biasing information is provided by preliminary site observations. Specifically, additional locations will be sampled where cracks in the concrete pit were observed, particularly along the gutter leading to the eastern sump; in areas from which decommissioning has removed fill, soil, or tuff because of elevated radiation readings; and in locations where the grid-based radiation survey indicates residual radioactive contamination.

Aliquots of each sample will be measured by the following field methods, which are potentially applicable in later phases of this investigation:

- hand-held beta/gamma instrument;

- organic vapor analyzer instrument;

- polycyclic aromatic hydrocarbon (PAH) immunoassay (if PAHs are shown to be a COPC);

- mobile radiological van screening for Department of Transportation purposes, including gross-alpha, -beta, and -gamma radiation; and

- mercury vapor analyzer (if mercury is shown to be a COPC).

For at least two samples, two aliquots will be submitted for field analyses.

The initial samples will be submitted for a comprehensive suite of analytes including radiochemical analysis for tritium; ^{238}Pu; $^{239,240}Pu$; ^{90}Sr; ^{234}U; ^{235}U; ^{238}U; gross-alpha, -beta, and -gamma radiation; gamma spectroscopy; RCRA metals; VOCs; and SVOCs. One-week turnaround will be required for all analyses.

The cleanup levels will be calculated for all constituents measured above SALs (or background for constituents without SALs) in these samples. COPCs for the VCA will be identified by comparing the observations with these preliminary remediation guidelines (PRGs). If no COPCs are identified by this process, these data will serve as verification data (concern 5), and no further investigation or site remediation will be performed.

If COPCs are identified, a possibly shorter list of COPCs will be developed, which will be based primarily on those that have been observed farthest above their PRGs but partly on what can be reliably measured using field instruments, field kits, or mobile laboratory analyses. These COPCs are referred to as "indicator constituents." If more than one release is identified at the site, "indicator constituents" will be identified for each release.

5.2.3 Extent of Contamination

The second phase of the investigation will be undertaken only if COPCs have been identified. However, sample collection for this phase may be performed concurrently with the initial phase sampling, and these samples would then be analyzed for the full suite of analytes, or these samples may be held for analysis until after the "indicator constituents" have been identified. The second phase may include the following:

- surface and auger sampling to a depth of up to 5 ft with screening for the indicator constituents collected as necessary to guide localized removal of additional fill, soil, and tuff, as described in Section 3.1; and/or
- sampling below the 5-ft VCA depth to evaluate the extent of the subsurface release (if feasible).

Data collected in this phase will address questions and concerns 2 and 3 in Section 5.1. The surface and shallow auger sampling will be required only if COPCs have been identified.

For the purposes of the second phase, the excavation will be subdivided into four to six sectors. The east side of the excavation where the three storage tanks were located will be three sectors; the north side of the phase separator pit where the two sumps and the caustic treatment tank were located will be a fourth; a north-south strip through the middle of the site including the east wall of the phase separator pit and the north-south drain gutter will be a fifth; and the remaining southwest portion of the phase separator pit excavation site will be the sixth sector. This partitioning of the site will be modified if earlier parts of the investigation have indicated some well-defined patterns of releases or as necessary to coordinate with decommissioning progress. The intention is to block off the excavation into pieces that are convenient for sampling and remediation.

Surface and Shallow Auger Sampling

If indicator constituents are found in a sector and if the sectors have only one surface sample or auger hole location, as described in Section 5.2.3, additional surface and auger hole samples will be collected and screened for the indicator constituents to bring the total number of sample locations up to a minimum of two.

Based on the results of these samples, contaminated material will be removed to the point where screening results at the remaining surfaces are less than the cleanup levels in any particular sector. However, the VCA will not be continued beyond 5 ft below the initial excavation. By collecting screening samples at auger depths of 2 to 3 ft in areas that are being considered for or are undergoing remediation, it may be determined that PRGs cannot be met within 5 ft, which will lead to a re-evaluation of the desirability of proceeding even to that depth.

5.2.4 Verification Sampling

This final phase of the investigation will be performed only if COPCs were identified by the initial sampling described in Section 5.2.2, and additional soil was then removed as described in Section 5.2.3.1. In sectors from which additional material has been removed, two locations will be sampled (or at least one location per area if there is more than one distinct remediated area within a sector). If above-background screening results are still obtained in remediated areas, verification samples will be biased to those locations. Otherwise, the samples should represent material that would be removed if excavation were to continue. These samples will be analyzed in off-site laboratories for all COPCs. Results will be combined with initial sampling results from unremediated sectors (if any), and a decision on whether the VCA is complete will be based on a comparison of 95% upper confidence levels (UCLs) for the means of each COPC with the cleanup level.

5.2.5 Assumptions and Data Quality Requirements

The implementation of Section 5.2.1 assumes complete cooperation between the decommissioning and VCA teams. VCA personnel must be present during decommissioning and must have either access to the site or authority to direct decommissioning personnel to carry out the tasks of Section 5.2.1.

The design for COPC identification (Section 5.2.2) is based on the assumption that if releases from this system occurred, either there will be some field indications of releases (Section 5.2.1) or releases will have occurred from the parts of the system where liquids were intended to accumulate, namely the two sumps and the three storage tanks. The design for COPC identification also assumes that any COPCs present at the surface of the excavation are representative of the COPCs present in the subsurface.

A major concern is the ability to identify a list of indicator constituents that can be adequately measured by field or mobile van analyses. The capabilities of the field screening methods will be estimated using the data from Section 5.2.2. If it proves to be impossible to use these methods to attain cleanup levels for one or more COPCs of major importance, VCA remediation will have to be guided by a smaller number of fast-turnaround, off-site analyses for the indicator analytes (Section 5.2.3). In this case it will be necessary to use the verification samples of Section 5.2.4 to compute UCLs within sectors as a guide to possible additional remediation because the limited number of screening samples will not provide enough assurance that cleanup levels have generally been met throughout the excavation.

5.3 SAP Implementation

The implementation of the SAP for PRS Nos. 35-003(a, b, c, and n) will proceed in conjunction with the decommissioning of the site. During removal of the structures, ER Project personnel will monitor the decommissioning activities and will work with the decommissioning contractor to evaluate and monitor the site. Special attention will be given to site inspection and documentation of the structures as they are removed, including any structural defects, obvious leaks, spills, or contamination that is found during removal of the structures. ER Project personnel will be available to collect confirmation soil samples as the structures are removed.

5.3.1 Field Methods

5.3.1.1 Preliminary Health and Safety Survey

A health and safety (H&S) survey of the site will be provided by the decommissioning site safety officer and/or the ER Project 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 including confined space entry, slips, trips, and falls 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) on the Daily Activity Log.

5.3.1.2 Engineering Surveys

Engineering surveys of the site will be performed to document the decommissioning activities and to establish the site conditions during and after decommissioning activities. The engineering surveys will include regular site inspections as decommissioning progresses and photographic and narrative documentation of the structure contents, conditions, and removal methods. After removal of the structures, the engineering survey will document the "as left" condition of the site. The information collected during the engineering surveys will be used to appropriately locate sample sites, especially if potentially contaminated "hot spots" are found or suspected. The results of the engineering surveys will also be used to support the decision process. The engineering surveys will be documented by the FTL on the Daily Activity Logs as described in Section 5.5.3.

5.3.1.3 Radiation Grid Survey

The radiation grid surveys will be performed using approved Laboratory group ESH-1 radiation detection equipment. The detection equipment will be calibrated, and the calibration will be documented daily on the ESH-1 Direct Survey Results Form as described in Section 5.5.3. The radiation grid survey points will be established by measuring the linear distance between grid points using a tape measure or similar means and by flagging or marking the grid sites. Unique grid site numbers will be assigned to each grid point, the locations of the radiation grid sites will be measured or surveyed from a known point, and coordinates for each grid site will be obtained. The radiation grid survey will be performed by obtaining a 1-min radiation count at each grid point if using a counter, or the radiation value will be determined by a 10-s reading of a rate meter/scalar instrument. The radiation grid site numbers and the results of the survey, including a brief description of each grid site, will be documented daily on the

field Radiation Grid Forms, and the forms will be signed by the FTL and the radiological control technician (RCT). The documentation of the radiation grid survey will be supplied with the Daily Activity Log by the FTL. When the grid site coordinate data are available, a map of the survey area will be created to display the locations of the grid sites and the results of the survey.

5.3.1.4 Field Sampling

Planned sample locations will be located in the field before sampling and will be described and documented in the Daily Activity Log. The actual sample site and sampling conditions will be described and documented on the Sample Collection Log. The sample material will be described on the Sample Collection Log and/or on the Core Description Log, if applicable. Sample collection methods will be documented on the Sample Collection Log. Surface samples, hand-auger holes, and possibly hollow-stem auger drilling methods will be used to collect soil samples as described in Section 5.5.3.

The soil samples will be field screened for gross-alpha, -beta, and -gamma radiation and for volatile organic vapors at the time of sampling. The field screening data will be recorded by the site safety officer on the Direct Survey Results Form and by the FTL on the Sample Collection Log, as described in Section 5.5.3. Information about the field screening equipment calibration will be recorded by the RCT on the Direct Survey Results Form and by the FTL on the Daily Activity Log.

If other field screening methods are identified that appropriately detect contamination, those field screening methods will be considered for use during sample collection. Appropriate field screening methods may be used to select sample locations and to guide the VCA, as necessary. The implementation of field screening methods will be documented by the FTL on the Daily Activity Log.

5.3.1.5 Assessment/Quality Control Samples

Assessment/quality control (QC) samples have been selected based on the process described in the ER Project Quality Assurance Project Plan (QAPP) (LANL 1996, 53450). As indicated in Table 2, one blind duplicate field sample will be collected and analyzed for each of the major analyte suites. Equipment rinsate blank (ERB) samples will be collected as deemed necessary by the field team to evaluate the efficiency of the field equipment decontamination procedures. It is expected that ERBs will be collected only after collecting samples known to be contaminated. Trip blanks will be included with sample delivery groups submitted for VOC analysis. The QC samples that are collected will be documented daily by the FTL on the Sample Collection Log and the Daily Activity Log.

5.3.1.6 Field Survey of Sample Locations

If field conditions permit, the sample locations will be surveyed by professional surveyors after sampling is complete. The location of each sample will also be measured from existing structures using a tape measure or similar device, and the sample location will be described relative to existing buildings and relative to the former structure that is associated with the sample. The FTL will document the location and description of the sample sites on the Daily Activity Log.

TABLE 2

SAMPLES TO BE COLLECTED FOR PRS NOs. 35-003(a, b, c, and n)

Planned Sampling Date	Sample No.	Depth (ft)	PRS No.	Gross -α, -β, -γ	γ-spec	α-spec	^{90}Sr	^{3}H in Soil	Metals by ICPES	VOCs	SVOCs
Initial samples											
3/14/96	D35-2295-A1	0–1	35-003(a)	1	1	1	1	1	1	1	1
3/14/96	D35-2295-A2	2–3	35-003(a)	1	1	1	1	1	0	0	0
3/15/96	D35-2296-A1	0–1	35-003(b)	1	1	1	1	1	1	1	1
3/15/96	D35-2296-A2	2–3	35-003(b)	1	1	1	1	1	0	0	0
3/20/96	D35-2297-A1	0–1	35-003(c)	1	1	1	1	1	1	1	1
3/20/96	D35-2297-A2	2–3	35-003(c)	1	1	1	1	1	0	0	0
3/21/96	D35-2298-A1	0–1	35-003(n)	1	1	1	1	1	1	1	1
3/21/96	D35-2298-A2	2–3	35-003(n)	1	1	1	1	1	0	0	0
3/22/96	D35-2299-A1	0–1	35-003(n)	1	1	1	1	1	1	1	1
3/22/96	D35-2299-A2	2–3	35-003(n)	1	1	1	1	1	0	0	0
3/22/96	D35-2300-A1	0–1	35-003(n)	1	1	1	1	1	1	1	1
3/22/96	D35-2300-A2	2–3	35-003(n)	1	1	1	1	1	0	0	0
Supplemental samples (if needed)											
3/25/96	D35-22XX-A1	0–1	TBD								
3/25/96	D35-22XX-A2	4–5	TBD								
Duplicate				1	1	1	1		1	1	1
ERB				1	1	1		1		1	1

TBD = to be determined

5.3.2 Field Decisions

The locations of sites of potential contamination will be located on a field site map and attached to the Daily Activity Log. If the anomalous sites are to be sampled, the criteria used to select the sample sites will be documented.

Field decisions required by this SAP include the following.

- As a result of the engineering surveys and radiation grid surveys, do site conditions indicate that the number and locations of the initial samples are appropriate?
- If contamination is indicated to be present by the initial sampling program, can field screening methods identify the contamination at levels of concern?
- Is the sampling plan appropriate for identifying the extent of contamination, or will additional sampling be required?
- Are site conditions present that prevent the identification of contamination or the determination of extent of contamination?

- Is the verification sampling plan appropriate for verifying the effectiveness of the VCA?

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

5.3.3 Measurement Methods

Soil samples collected in the initial sampling event described in Section 5.2 will undergo full-suite analyses for organic, inorganic, and radionuclide constituents to determine the COPCs present at the site. All full-suite analyses will be performed at an ER Project-approved fixed-site laboratory. All samples will be submitted for rapid turnaround (five days) analyses. If the radioactivity of any sample exceeds the limits for the external subcontractor laboratories, alternative arrangements will be made for analysis at an internal Laboratory facility.

The analyte suites are listed in Table 3. All analyses for organic constituents will be performed according to EPA SW-846 protocols (EPA 1986, 31733). All analyses for inorganic constituents will be performed according to EPA SW-846 protocols (LANL 1986, 31732) using mineral acid sample extraction procedures for the inductively coupled plasma emission spectroscopy, graphite furnace atomic absorption, and inductively coupled plasma mass spectrometry techniques. The detailed analyte lists, estimated quantitation limits (EQLs) or estimated detection limits, required QC procedures, and the acceptance criteria for organic and inorganic analyses are found in the ER Project analytical services statement of work (LANL 1995, 49738).

The target analytes and their half-lives, detected emission, EQLs, and analytical methods for radionuclide constituents are listed in Table 4. Before chemical separation and counting for alpha or beta emissions, samples will undergo a complete digestion or fusion procedure. All samples submitted for tritium analysis will also be analyzed for moisture content. The analyte list for the gamma spectroscopy analysis is given in the

TABLE 3

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

Analyte Suite	Analytical Method	Analytical Protocol
Organic constituents		
SVOCs	GC/MS[b]	SW-8270
VOCs	GC/MS	SW-8260
Inorganic constituents		
Trace metals	ICPES[c]	SW-6010
As, Pb, Sb, Se, Tl	ICPMS[d] or GFAA[e]	SW-6020 or SW-7000
Hg	CVAA[f]	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/MS = gas chromatography/mass spectrometry
c. ICPES = inductively coupled plasma emission spectroscopy
d. ICPMS = inductively coupled plasma mass spectrometry
e. GFAA = graphite furnace atomic absorption
f. CVAA = cold vapor atomic absorption

TABLE 4

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

Analyte	Half-Life (years)	Detected Emission	EQL (pCi/g)	Analytical Method
H	12.3	β	300 pCi/L	LSC[a]
^{238}Pu	87.7	α	0.1	α-Spectrometry
$^{239,240}Pu$[b]	2.410×10^4	α	0.1	α-Spectrometry
^{90}Sr	29.1	β	2.0	GPC[c]
^{234}U	2.46×10^5	α	0.1	α-Spectrometry
^{235}U	7.04×10^8	α	0.1	α-Spectrometry
^{238}U	2.342×10^7	α	0.1	α-Spectrometry
Gamma spectroscopy[d]	--	γ	1[e]	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)[f] or HPGe[g] detection

a. LSC = liquid scintillation counting
b. The ^{239}Pu and ^{240}Pu isotopes cannot be distinguished by alpha spectrometry. The half-life of ^{239}Pu is given.
c. GPC = gas proportional counting
d. The gamma spectroscopy analyte list is given in the ER Project analytical services statement of work (LANL 1995, 49738).
e. The minimum detectable activity for ^{241}Am and ^{137}Cs is 1 pCi/g; the value for other analytes will vary.
f. NaI(Tl) = thallium-doped sodium iodide
g. HPGe = high-purity germanium

ER Project analytical services statement of work (LANL 1995, 49738) and includes long-lived activation and fission products such as ^{241}Am, ^{60}Co, ^{137}Cs, and ^{237}Np. Shorter-lived daughter products are included in the analyte list to verify the presence of the longer-lived parents. The shorter-lived radionuclides (half-life less than 180 days) are not considered to be primary COPCs because natural decay will have resulted in their disappearance during the more than 30 years since the wastewater treatment plant was last operated. Soil samples will be prepared for gamma spectroscopy measurements by homogenization and drying; no sample extraction will be performed. The required QC procedures and acceptance criteria for the radiochemical analyses are found in the ER Project analytical services statement of work.

Samples collected in subsequent sampling events will be analyzed for a limited suite of COPCs using the methods and procedures described for the full-suite analyses. Mobile laboratory measurements may be used if reliable methods are available. If a mobile laboratory is used, the technical team chemist will determine the appropriate methods and method validation criteria, QC procedures, and acceptance criteria before submitting any samples.

5.3.4 Sample Handling

All 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, Draft). 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 off-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 (LANL 1996, Draft) will be followed. Manually recorded data will be reviewed by the field team as required by LANL-ER-SOP-1.01, 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 of Activities

The TA-35 Decommissioning Project is preparing to remove the structures associated with these PRSs as this VCA plan is being prepared. The Field Unit 4 field team has begun to monitor the site activities and document decommissioning findings according to this SAP; therefore, the preliminary investigation portions of the SAP are already being implemented. The removal of the storage tanks and the decommissioning of the phase separator pit are scheduled to be performed by the Decommissioning Project in March 1996. The planned sampling activities will be performed in conjunction with the decommissioning activities.

VCA activities are planned to occur during a three-week period. The schedule of activities is shown in Table 5. The data compilation and report preparation are planned to occur during approximately four weeks after the VCA activities are completed. This schedule will require adjustment depending on when actual decommissioning of the phase separator pit commences.

TABLE 5

SCHEDULE OF ACTIVITIES FOR PRS NOs. 35-003(a, b, c, and n)

VCA Activity	Beginning Date	Number of Days to Complete
Decommissioning activities	4/15/96	10
VCA sampling	4/18/96	10
Data analysis	4/18/96	15
Decision process (ongoing)	4/22/96	15
Possible VCA	4/26/96	10
VCA verification sampling	5/6/96	2
Verification sample analysis	5/6/96	8
Report preparation	5/13/96	20

5.4 Data Assessment

5.4.1 Data Review, Verification, and Baseline 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 shall consist 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 6 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 LANL-ER-AP-05.2, R1, "Determination, Completion, and Documentation of Environmental Restoration Worker Training." ER Project personnel training records are located on-site during field activities and will be available

TABLE 6

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

for inspection. ER Project personnel will not perform tasks under site conditions that require special training beyond that documented in their training records. Decommissioning contractor personnel will be used for restricted site-specific activities, such as confined space entry, for which the appropriate training requirements are specified in the existing TA-35 decommissioning SSHASP. Documented certifications are managed by the TA-35 Decommissioning Project H&S personnel.

5.5.3 Records

Field records will document sample collection and tracking, H&S briefings and checks of monitoring equipment performance, and nonsampling activities such as site inspections/walkovers and monitoring of decommissioning project progress, which are documented as engineering surveys in Daily Activity Logs. Table 7 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 administrative procedure LANL-ER-AP-02.1, R1, "Procedure for LANL ER Records Management."

TABLE 7

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[c] 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
c. PPE = personal protective equipment

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 ER-SOP-01.04, R3.

5.6 Oversight

Oversight, review, and approval of VCA activities are provided by the following Laboratory groups:

- ESH-1 for RCT 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 Questionnaire;
- ESH-18 for review, approval, and oversight of the Storm Water Pollution Prevention Plan and the Spill Prevention, Control, and Countermeasures Implementation Plan;
- ESH-19 for oversight of the waste management plan and/or the Waste Characterization Strategy Form;
- CST-5 and CST-17 for review and approval of the waste management plan and/or the Waste Characterization Strategy Form;
- ER Project Office for review and approval of the VCA plan and final report; and
- DOE for review and approval of the VCA plan and final report.

The appropriate portions of this VCA plan have undergone review and approval by the above noted groups. The ES&H Questionnaire process was completed, and the VCA plan meets the required elements of LANL-ER-AP-05.1, R1, "Readiness Review for Environmental Restoration Project Field Activities," although a formal readiness review for this activity is not required.

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). Laboratory group ESH-5 will evaluate the ER Project field operations to determine compliance with H&S requirements.

5.7 Inspection and Acceptance Policies

All activities associated with this 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. Laboratory group CST-9 provides the sample containers used for sample collection. 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.

5.8 Reports to Management

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

5.9 Attachments

The following field forms (which are not included in the 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 Form
- ESH-1 Smear Continuation Form
- FU 04 Equipment and Item Removal Log
- FU 04 Survey Form
- FU 04 Site Access List
- FU 04 Tailgate Safety Meeting

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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: _____

_____

_____

ADDITIONAL INFORMATION

☐ Occurrence No.: _____

☐ Incident No.: _____

☐ RWP No.: _____

INSTRUMENTATION

TYPE	HSE No.	CAL DUE	% EFF	B

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*	C

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 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

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

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·(b°·t_S)$^{0.5}$)]/(Eff·t_S)
t_S = Sample Count Rate
b° Background Count Rate

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

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 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 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)

6.0 ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES

The time estimated to complete the planned VCA activities is approximately three weeks, as outlined in Section 5.3.6.

Uncertainties are primarily related to the site conditions resulting after the phase separator pit and the three storage tanks have been removed. If the structures are removed intact and no release to the environment has occurred, confirmation and verification soil sampling may show that no additional cleanup is required. However, if after the decommissioning activities it is found that releases to the environment have occurred, several phases of soil excavation and soil sampling and analyses may be required.

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7.0 ANNEXES

7.1 Risk-Based Cleanup Level Assumptions and Calculations

The risk-based cleanup level assumptions and calculations will be determined after the results of the initial soil samples are obtained. The risk-based cleanup level assumptions and calculations will be provided in the final VCA report.

7.2 RFI Analytical Results

RFI analytical data have not been obtained for PRS Nos. 35-003(a, b, c, and n) because the site is planned for decommissioning. The TA-35 Decommissioning Project collected soil samples to plan the decommissioning activities. Those analytical results that are above Laboratory SALs are presented. Only radionuclides were reported above SALs. These data are presented in Table 8 in the place of RFI data.

TABLE 8

DECOMMISSIONING SAMPLE RESULTS FOR RADIOACTIVITY DATA ABOVE SALs

Sample Location No.*	Depth (ft)	Sample Identification No.	Tritium (pCi/L) SAL = 260	^{40}K (pCi/g) SAL = 12	^{238}Pu (pCi/g) SAL = 27	^{226}Ra (pCi/g) SAL = 0.10	^{90}Sr (pCi/g) SAL = 4.4
B-1-SS	0-2.5	35-93.27101	2653				
	2.5-5.0	35-93.27102	2119				
	5.0-7.5	35-93.27103	4164				
	7.5-10.0	35-93.27121	5361				
	10.0-12.5	35-93.27122	3296				
	12.5-15.0	35-93.27099	5401				
	?	35-93.27100	5717				
B-3-SS	0-2.5	37-94.00669					
	2.5-5.0	37-94.00670					
	5.0-7.5	37-94.00673					
	7.5-10.0	37-94.00674					
	10.0-12.5	37-94.00677					
B-4-SS	0-2.5	38-93.26720	372	23		0.617	
	2.5-5.0	38-94.26721	161	28		0.847	9.81
	5.0-7.5	38-94.26707	513	29		0.9	
	7.5-10.0	38-94.26709	295	21		0.881	
	10.0-12.5	38-94.26710	601	24			
B-5-SS	0-2.5	39-93.26704	983	29		1.04	47.07
	2.5-5.0	39-93.26705	194	29		1.07	
	5.0-7.5	39-93.26708	287	28	55	1.13	4.52
	7.5-10.0	39-93.26706	638	28		0.987	6.15

*See Figure 3 for locations of samples.

7.3 Site Maps

Figure 1 is a site map of PRS Nos. 35-003(a, b, c, and n).

Figure 3 is a site map showing the location of decommissioning samples.

7.4 Implementation Standard Operating Procedures

Implementation SOPs for the SAP are described and listed in Section 5.5.3. The ER Project SOPs are located in Volumes I and II, as updated to 1995 (LANL 1991, 21556).

7.5 Quality Assurance Plan

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

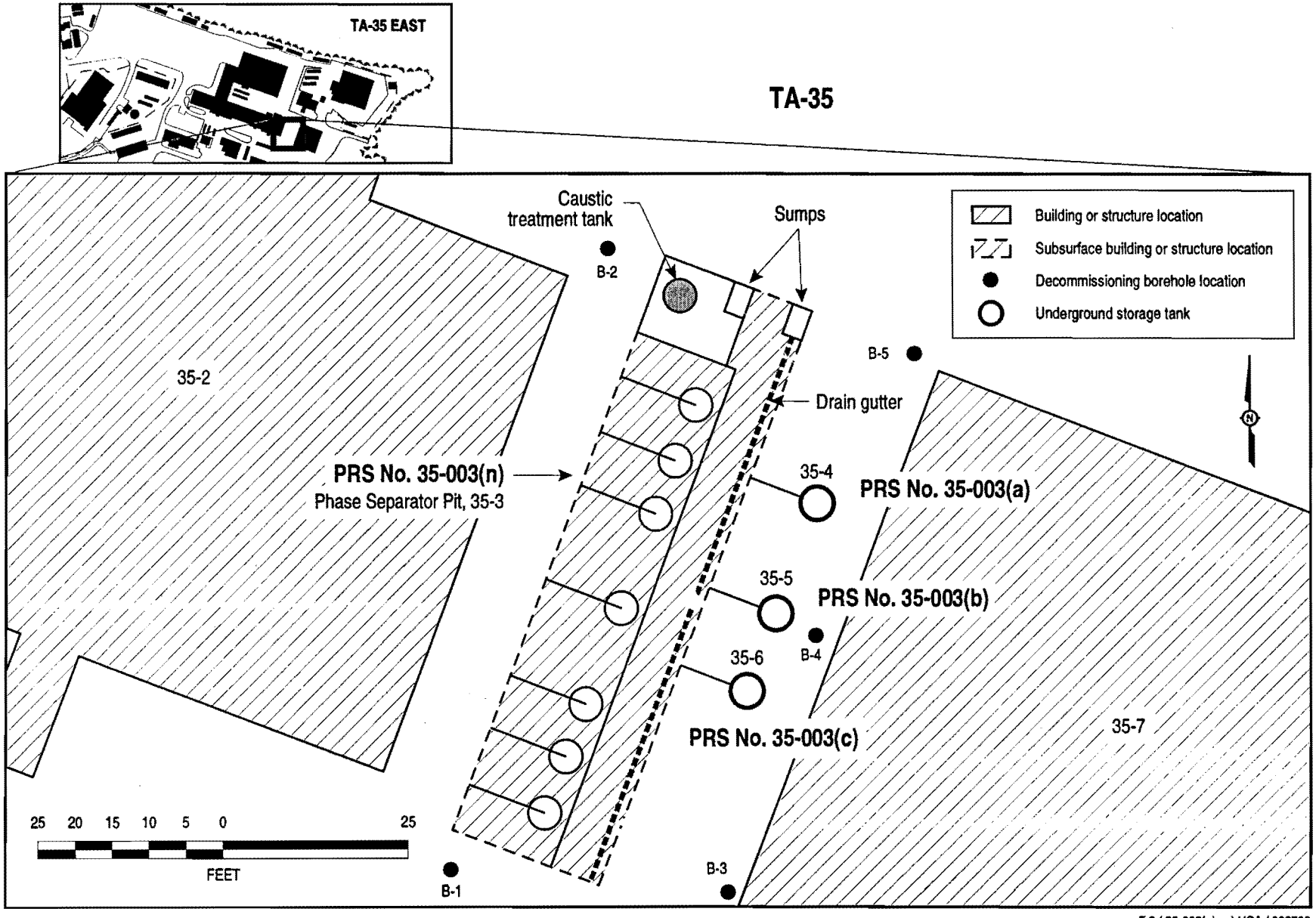


Figure 3. Schematic map showing locations of decommissioning samples at PRS Nos. 35-003(a, b, c, and n).

7.6 Site-Specific Health and Safety Plan

Two SSHASPs will be used at this VCA site. The site characterization will be performed by ER Project personnel operating under the TA-35 RFI SSHASP, as modified in February 1995 specifically for sampling activities at PRS Nos. 35-003(a, b, c, and n).

The SSHASP in place for the TA-35 Decommissioning Project is located in *TA-35 D&D Project: Implementing Plans for support of Phase I Decommissioning Activities* LANL 1995, 53455).

Los Alamos National Laboratory

ER PROJECT SHORT FORM SSHASP

SSHASP Number 113

Location TA-35 Potential Release Site (PRS) 35-003 (a,b,c, and n) *Field Unit* 4

Task Name Voluntary Corrective Action *Date* March 7, 1996

SSO Approval _____ *Date* 3/8/96

Field Project Leader Approval _____ *Date* 3/8/96

Field Unit HS Rep. Approval _____ *Date* 3/8/96

ESH-1 ER/D&D Team Leader _____ *Date* 3/8/96

Subcontractor HS Approval _____ *Date* 3-8-96

Field Team Manager Approval _____ *Date* 3/8/96

Key Personnel

Facility Representative Pete Bussolini *Phone/Pager* 667-0370

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 (alternate) *Phone/Pager* 672-3666/699-2762

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

ESH-1 Oversight Marty Piefer *Phone/Pager* 667-0083/104-6649

ESH-1 Team Leader Pat LaFrate *Phone/Pager* 667-7137/104-7234

Task Description

This task includes radiological site surveys and soil sampling to verify completion of decommissioning activities of four storage tanks (PRS Nos. 35-003 (a,b,c, and n). PRS No. 35-003(n) is the phase separator pit (structure No.35-3) and PRS Nos. 35-003(a,b,and c) are three associated underground holding tanks (Structure Nos. TA-35-4, -5, and -6, respectively), that are located between buildings TA-35-2 and TA-35-7 near the east end of TA-35. These structures will be decommissioned by the TA-35 Decommissioning Project. Decommissioning activities planned for 1996 include the removal of the phase seperator pit and the three 600 gal. storage tanks. The decommissioning activities

are planned to include the removal of up to 2 ft of soil beneath the structures if gross-gamma soil contamination is detected by field screening. Upon completion of decommissioning, excavation, and removal of the structures, and before site filling and grading, radiological site surveys will be performed and surface soil samples will be collected on the excavated horizon, this effort will verify completion of the decommissioning cleanup activities, or determine if contamination is present at depths greater than two feet. In the event that contamination is present at depths greater than two feet, additional samples will be collected with a rotary hammer assisted hand auger to determine the extent of contamination. Once the extent of the contamination has been established the contaminated soil will be removed to a maximum depth of five feet by the TA-35 Decommissioning Project personnel.

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, VOCs, and Metals. There is no evidence that these tanks have leaked. The OU1129 RFI work plan stated that the tanks may have also contained solvents and other chemicals. Therefore, the soil will be suspect of having being contaminated with SVOCs, VOCs, and Metals. HAR of Minor.

Biological: Snakes, ticks, rodents (hantavirus), and bloodborne pathogens. HAR of Minor.

Physical: Slips, trips, falls, and falling into deep excavations. HAR of Minor.

Radiological: ^{238}Pu, ^{239}Pu, ^{90}Sr, ^{234}U, ^{235}U, and ^{238}U. HAR of Minor.

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

Will task affect other LANL operations, other employees, or other tasks? No X Yes

If yes, explain precautions taken and contacts notified

Hazard Controls

Engineering/Administrative Controls, Special Equipment, etc. N/A

Additional Comments Attached: Yes No X

PPE (Personal Protective Equipment)

Head Hard hats if heavy equipment is used.

Face & Eye Safety glasses

Gloves Nitrile gloves and leather gloves if work requires.
Hearing Hearing protection will be worn if noise levels exceed 85dB(A)
Body Coveralls (Cotton or Kleenguard at SSO discretion) for EZ work.
Foot Steel toe safety shoes for EZ work.
Respiratory: Type of Respirator NA Type of Cartridge _____

Additional Protection/Comments None

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 VOC constituents. Action level will be 1 ppm above background sustained for one 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 7.5mg/m^3. If total dust action level is achieved, dust suppression(water mist) will be implemented.

Biological: None

Physical: If noise levels exceed 85dB(A), workers will wear hearing protection. Ear plugs will be worn during an initial survey to establish noise levels in the working zone.

Radiological: β/γ ESP-1 with HP-260 probe or equivalent. α- Ludlum 139 with air proportional probe or equivalent. In addition a μR/hr meter or equivalent will be used along with TLD dosimetry as per Appendix B. No evidence exists to indicate that these tanks have leaked, however process knowledge indicates that initial operations at TA-35 involved a variety of radionuclides, therefore the possibility of encountering radioactive contamination exists.

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 PRSs.

Decontamination

Describe how decon will be performed and which option will be used (ER Project HASP, Section 8).
Dry decontamination will be performed on sampling equipment. Waste generated from decontamination will be disposed of bt TA-35 Decommissioning Project personnel.

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.

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

Communications: Cellular phones on site (699-1702 and 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. 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 85dB(A). In addition, TLDs will be required per Appendix B.

Training Requirements

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

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

Pre-job Conference: Date/Initials _____

Printed Name	Z Number	Signature	Date
Darril STAFford	113569		3/8/96
Richard Koch	114816		3/11/96
Richard H. Hon	113376		3/11/96
Carmella Romero	099070		3/11/96
LESLIE SONTAG	117380		3/11/96

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 operations begin. 1-A Equipment preparation / Mobilization: this task will include installation of zone barriers, equipment mobilization, and preparation.	None	3/1/96-10/31/96
Task 2 Surface and near surface soil sampling.	This task includes all activities directly involved with or taking place during site cleanup to DOE or EPA acceptance criteria. 2-A Surface soil sampling: Will utilize the spade/scoop method for collection of soil samples 0-6 inches in depth. 2-B Near surface soil sampling: Use of a rotary powered hand auger for collection of samples from depths up to 5 feet. 2-C Exposure monitoring: Use of real time and integrated monitoring equipment to monitor employee exposures to radiological and chemical hazards. Physical and safety hazards will be identified by the on-site SSO.	VOCs, SVOCs, Metals, and Rad	3/1/96- 10/31/96
Task-3 Decontamination	This task involves all decontamination activities during sampling. 3-A All sampling equipment will be decontaminated utilizing dry decon methods. Any waste generated will be disposed of by TA-35 Decommissioning Project personnel.	VOCs, SVOCs, Metals, and Rad	3/1/96- 10/31/96

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 100 100 mREM/year dose limit	Monthly TLD Badge	10 CFR 835
Internal sources of Radiation Exposure	All	Potential to exceed 100 100 mREM/year dose limit	Urinalysis - In Vitro 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	TASK(S)		
	1	2	3
Option 1 Standard Approach Level D			
Dry decontamination with Fantastic and paper towels.	N/A	N/A	X

APPENDIX D
EMERGENCY CONTACTS AND PHONE NUMBERS

TA-35

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 LaFrate---------- 667-7137/104-7234
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

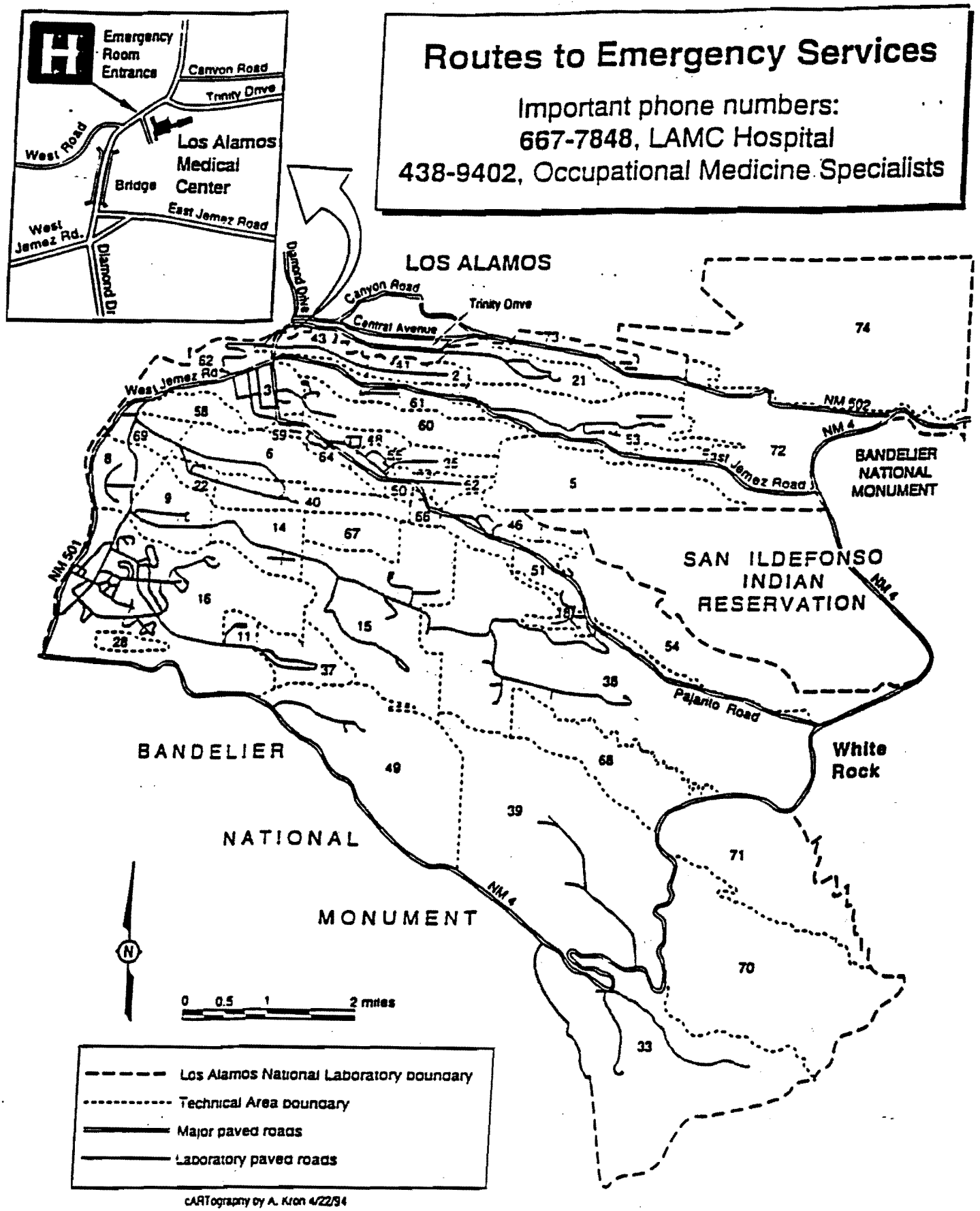
TRAINING REQUIREMENTS

R=Read Training; C=Class Training; F=Field Training; AN=As needed per the HAS; ER=Employee Required

Training Requirements	Personnel Role				
	FTM	FTL/Sampler	SSO/RCT	Waste Mgmt	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	C		
8 Hr Refresher	C	C	C	C	C
First Aid		C	C		
CPR		C	C		
Sanitation [29 CFR			R		
Signs,Signals, Barricades [29 CFR 1926.200]			R		
Excavation/Trenching Competent Person [29 CFR 1926.65(k)(1) and 32 (f)]		R	R		
First Responder Awareness			C		
PPE (level D)	F	F	F	F	F
Bloodborne Pathogens			C		

Routes to Emergency Services

Important phone numbers:
667-7848, LAMC Hospital
438-9402, Occupational Medicine Specialists



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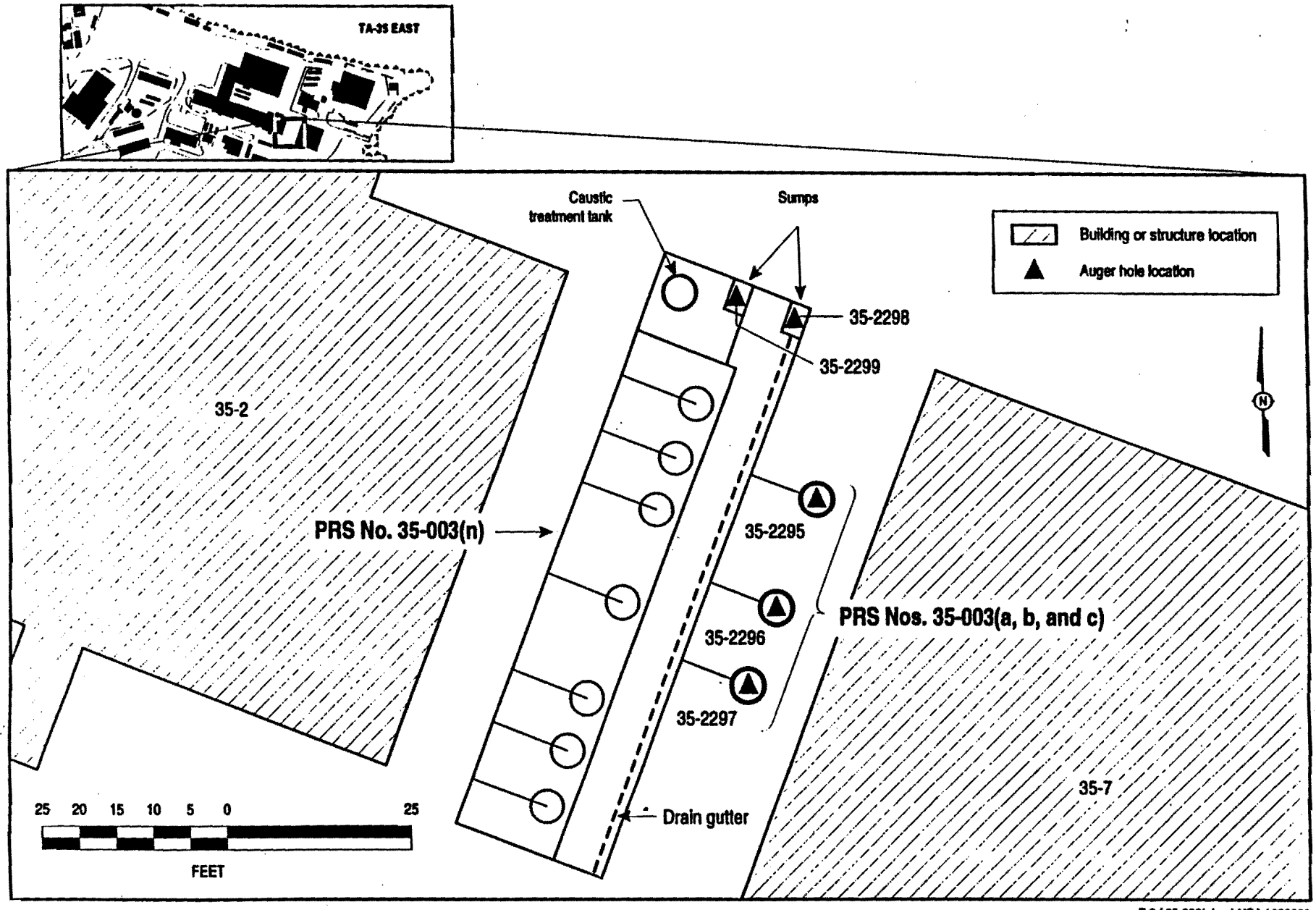

Figure 2. Schematic location map of the phase separator pit, PRS Nos. 35-003(a, b, c, and n).

7.7 Waste Characterization Strategy Form

The waste management plan for the TA-35 Decommissioning Project will be used for the VCA at PRS Nos. 35-003(a, b, c, and n). This plan is located in *TA-35 D&D Project: Implementing Plans for support of Phase I Decommissioning Activities* (LANL 1995, 53455).

7.8 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 Nos. 35-003(a, b, c, and n) **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

Through reviewing the VCA Plan, for site(s) PRS Nos. 35-003(a, b, c, and n), and believing that the above criteria have been met, I authorize the fieldwork to proceed.

DOE ER Program Manager — Date 3/28/96

7.9 Cost Estimate

Table 9 shows the estimated cost for completing the VCA activities.

TABLE 9

ESTIMATED COST WORKSHEET

Category	Rate	Units	Cost
VCA Plan Preparation			
Technical preparation	$1,000/day	8 days	$8,000
Technical edit/reviews	$500/day	4 days	$2,000
SSHASP preparation	$500/day	4 days	$2,000
Subtotal			**$12,000**
Field Sampling			
Field team leader, site safety officer	$1,000/day	8 days	$8,000
Geodetic surveys	$1,000/day	2 days	$2,000
Subtotal			**$10,000**
Analytical Costs			
Radiological van (split cost)	$1,000/day	8 days	$8,000
Lab radiological analyses	$2,400/full sample	15 samples	$36,000
Lab metals/organics	$3,000/full sample	6 samples	$18,000
Subtotal			**$62,000**
VCA (if required)			
ER oversight			
Field team leader, site safety officer	$1,000/day	5 days	$5,000
Decommissioning contractor	$5,000/day	5 days	$25,000
Waste disposal	$5,000/day	5 days	$25,000
Subtotal			**$55,000**
Report Preparation			
Technical preparation	$1,000/day	15 days	$15,000
Technical edit/reviews	$1,000/day	5 days	$5,000
Subtotal			**$20,000**
Acceptance Inspection	$1,000/day	1 day	$1,000
Total Estimated Cost			**$160,000**

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REFERENCES

Elder, J. C., E. J. Cox, D. P. Hohner, and A. M. Valentine, September 1986. "Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981–1986)," Los Alamos National Laboratory Report LA-10821-MS, Los Alamos, New Mexico. **(Elder et al. 1986, ER ID Number 3089)**

Emelity, L. A., April 18, 1958. "History of Ten Site Plant," Los Alamos Scientific Laboratory Report, Los Alamos, New Mexico. **(Emelity 1958, ER ID Number 794)**

EPA (US Environmental Protection Agency), November 1986. "Test Methods for Evaluating Solid Waste, Volume IA: Laboratory Manual, Physical/Chemical Methods," SW-846, Third Edition, Washington, DC. **(EPA 1986, ER ID Number 31732)**

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)**

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), November 17, 1993. "TA-35 D&D Project, Phase Separator Pit, Characterization Plan & Health & Safety Plan & Waste Management Plan for support of Characterization Activities," Los Alamos, New Mexico. **(LANL 1993, ER ID Number 23256)**

LANL (Los Alamos National Laboratory), 1994. "LANL Radiological Control Manual," Los Alamos, New Mexico. **(LANL 1994, ER ID Number 43737)**

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), February 1995. "TA-35 D&D Project: Implementing Plans for support of Decommissioning Activities," Los Alamos, New Mexico. **(LANL 1995, ER ID Number 53455)**

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)/Voluntaty 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)**

PCT (Project Consistency Team), May 5, 1995. "Draft: Project Consistency Team (PCT) Policy Memo on Management of Investigation Derived Waste (IDW)," Los Alamos National Laboratory Memorandum EM/ER:95-PCT-020 to Distribution from Janet Harry, Los Alamos, New Mexico. **(PCT 1995, ER ID Number 46200)**