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U.S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504

Date: December 15, 1998
Refer to: EM/ER:98-475

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

SUBJECT: TRANSMITTAL LETTER FOR SWMU 0-017 SAP

Dear Mr. Garcia:

Enclosed is Los Alamos National Laboratory's Sampling and Analysis Plan (SAP) for the Resource Conservation and Recovery Act Facility Investigation (RFI) at Solid Waste Management Unit 0-017 Waste Lines 170 and 171. This letter is provided as an official submittal for the SAP, which was hand delivered to your office on August 31, 1998 for the purpose of discussing the investigative approach that was to be used at the site. A Request for Supplemental Information (RSI) was subsequently issued on the hand delivered SAP. The RSI was received on September 22, 1998, and a response to the RSI, with a revised SAP, was mailed to HRMB on October 19, 1998, (EM/ER: 98-424) (2 enclosed). The fieldwork was completed November 11, 1998.

An RFI Report will be drafted once the final validated analytical data has been received. We anticipate a delivery date no later than April 1, 1999. If you have any questions, please contact Terry Rust at (505) 665-8843 or Joe Mose at (505) 667-5808.

Sincerely,

Julie A. Canepa, Program Manager
LANL/ER Project

Sincerely,

for Joseph H. Mose

Theodore J. Taylor, Program Manager
DOE/LAAO

JC/TT/SP/dm

Enclosure: SAP for SWMU 0-017 dated August 1998
RSI Response and Revised SAP, October 1998

7046

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CERTIFICATION

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Document Title: Los Alamos National Laboratory Permit Modification Request

Name: _____ Date: 6/4/01

Julie A. Canepa, Program Manager
Environmental Restoration
Los Alamos National Laboratory

or

Michael P. Baker, Acting Division Director
Environmental Management
Los Alamos National Laboratory

Name: _____ Date: 6/4/01

Theodore J. Taylor, Project Manager
Environmental Restoration Program
DOE-Los Alamos Area Office

or

Joseph Vozella,
Assistant Area Manager of
Environmental Projects
Environment, Safety, and Health Branch
DOE-Los Alamos Area Office

ENCLOSURE

SAP for SWMU 0-017
dated August 1998

SAMPLING AND ANALYSIS PLAN
FOR
THE RCRA FACILITY INVESTIGATION AT
SOLID WASTE MANAGEMENT UNIT 0-017
WASTE LINES 170 AND 171

Los Alamos National Laboratory

Environmental
Restoration
Project

August 1998

1.0 INTRODUCTION AND SCOPE

This sampling and analysis plan (SAP) addresses the RCRA Facility Investigation (RFI) sampling activities associated with the Solid Waste Management Unit (SWMU) 0-017, waste lines 170 and 171. The site is located in former Technical Area (TA) –0, in the current Los Alamos Medical Center (LAMC) area. Line 170 is a 200 foot section of pipe running east of the Health Research Laboratory (HRL-1) under the lawn and parking lot to Manhole ULR-61. Line 171 is a 365 foot section of pipe running east from Manhole ULR-61 under the LAMC North Wing and under the hospital parking lot to the location of the former Manhole ULR-60 (removed in 1977). The origination point for these pipelines is the HRL-1. Work was done at the HRL-1 with low quantities of radioisotopes carbon-14, tritium, plutonium-238, plutonium-239, polonium-210, uranium-238, uranium-239, promethium and thorium. Major chemical wastes were alcohols (ethyl, methyl, and butyl), fluorescent dyes ethidium bromide and propidium iodide. As was general practice the radioisotopes were disposed of as radiation waste, while the chemicals were disposed of as chemical waste.

Lines 170 and 171 are being recommended for sampling because the LAMC will be conducting construction activities in the immediate area commencing October 1, 1998. The sampling activities outlined below focus on collecting confirmation samples collected from beneath the pipelines. Pipe construction is vitrified clay pipe (VCP), based on engineering drawing specifications. Depth to the pipe varies from 18 to 20 feet below the current grade, again based on the original engineering drawings. An ecotoxicological risk assessment will not be conducted because of the depth of the remaining piping and no viable pathways to receptors exist. The data from the analytical results will be evaluated in accordance with the State of New Mexico risk-based decision tree. The purpose of this abridged SAP is to expedite the sampling effort associated with the waste lines, which are located on private property, so that field work may be completed prior to the scheduled private development of the site and commencement of construction activities.

2.0 RCRA FACILITY INVESTIGATION RESULTS

2.1 Field Work

In 1977, prior to impending major road construction, some industrial waste line segments and manholes were removed. A portion of this activity included:

- Excavation and removal of manhole URL-60.

The results of these field activities (DOE, 1979) and data evaluation indicate that Manhole URL-60 was contaminated inside with approximately 50 pCi/g Pu-238, 2,560 pCi/g Pu-239, 235 pCi/g Am-241, and 340 pCi/g Cs-137. After removal, gross alpha analyses of soil samples were all less than or equal to 25 pCi/g. The inlet pipe from the HRL had no detectable activity and was sealed with a concrete plug. No analyses were conducted for analytes other than radionuclides.

In March 1991, a portion of line 170 was removed in a decommissioning and demolition (D&D) event. This activity included:

- Excavation and removal of twenty-six ft of line beginning at HRL-1 and continuing in the eastern direction.

2.2 Reporting Requirements

The reporting requirements associated with SWMU 0-017 are summarized chronologically in Table 2.2-1.

Table 2.2-1
CHRONOLOGICAL SUMMARY OF REPORTING REQUIREMENTS

DOCUMENT	DATE	SUMMARY
OU 1071 Work Plan	May 1992	LANL submits work plan to EPA
Approval Letter	Received January 6, 1993	EPA gives approval to OU 1071 Work Plan

3.0 SAMPLING OBJECTIVE AND APPROACH/DESIGN

3.1 SAMPLING OBJECTIVE

The objective of this investigation is to verify the depth of waste line and to sample beneath the waste line on a 30 foot spacing. The results of these data, along with consideration of depth and access constraints, will be used to determine if the lines (170 and 171) should be excavated or left in place.

3.2 SAMPLING APPROACH/DESIGN

The 1992 RFI Work Plan for Operable Unit 1071 was developed jointly with the Environmental Protection Agency (EPA) Region 6. The goal was to ensure that these sites present no hazards that could constrain future use of the properties on which they are located. This sampling approach is intended to implement the RFI Work Plan. Three tasks are described in the RFI Work Plan: Task 1 – Field Surveys, Task 2 – Surface Sampling, and Task 3 – Subsurface Sampling.

3.2.1 TASK 1 – FIELD SURVEYS

Three activities are described in the work plan under Task 1. Activity 1 – Site Survey will be conducted as specified in the plan with the exception that a detailed site map showing the remaining sections of the waste lines and associated structures will not be prepared. Activity 2-Geophysical Surveys will not be conducted because the pipeline is made of clay and is at a depth that geophysics would not provide conclusive data. Activity 3 – Radiological Survey will be conducted in conjunction with the subsurface sampling, but not with respect to aboveground lines, as the referenced aboveground lines are no longer in existence.

3.2.2 TASK 2 – SURFACE SAMPLING OF ABOVEGROUND LINES AND ANCHORS

Two memos (Cox, 1984, ER ID 30811) and (Montoya,1985, ER ID 7295) provide details of how Line 167 was removed from the north and south sides of Los Alamos Canyon. To summarize, the three-inch cast iron pipe was cut on each side of the concrete anchors and the sections between the anchors were removed. The approximately three foot-long section of pipe encased within each anchor was decontaminated and the ends were sealed with concrete. The concrete anchors were then buried with fill material to a depth of one foot above the encased pipe. The removed pipe and soil samples collected between the anchors were screened for gross alpha, beta, and gamma radiation.

Based on a preliminary site survey, it was confirmed that Line 167 was removed, that the concrete anchors are still in place, and that the ends of the encased pipes are plugged with concrete as documented in the referenced memos.

Removal and wipe sampling of the remaining three-foot sections of above ground pipe will not be completed as discussed in the work plan because the pipe was decontaminated and plugged with concrete, and is encased in the concrete anchors as confirmed by the preliminary site survey. It is proposed that documentation from the Line 167 removal be obtained to document existing contamination levels at the time the pipe was removed, and that the current condition of the concrete anchors be documented with photographs. No additional sampling or removal activities will be performed until this information can be reviewed and the task of removing the anchors reevaluated.

3.2.3 TASK 3 – SUBSURFACE SAMPLING

Two activities are described in the work plan under Task 3. Activity 1 – Sampling and Removal of Buried Lines and Activity 2 – Coring at ULR-33.

3.2.3.1 Activity 1 – Sampling and Removal of Buried Lines

This activity is described in the work plan in three steps: site preparation, field screening and removing lines, and sampling material beneath the lines. Work plan activities may not have considered the actual depths of waste line burial. Research of engineering drawings and collection of survey data indicate that lines 170 and 171 may be buried at depths of 18 to 20 feet. Given excavation equipment limitations, side slope stabilities and size of excavation and minimization of foundation damage to existing structures by maintaining safe distances, it may not be feasible to remove the remaining line segments as originally proposed in the work plan. Therefore, the following deviation is proposed.

Site Preparation

- End points of the line and approximate route and depth will be located by surveying.
- The parking lot east of the North Wing of LAMC (site of proposed construction of new wing) will be closed, fenced off, and posted.

Field Screening

Construction Activities

- A backhoe will be used to excavate two trenches at each end of the line to verify depth. A trackhoe will be available from the excavation contractor in case the waste line is deeper than the backhoe can excavate.
- Clean soil removed from above the waste line will be stockpiled within the fenced area and later returned to the excavation during backfilling.

Excavation and Disposal of Pipe

All data indicate the piping is greater than 15 feet deep and will therefore be left in place. A drill rig will be substituted for a backhoe to obtain samples at an interval of 30 feet along the length of the pipe at the depths indicated below. However, if piping is found to be less than 15 feet, then the following shall occur:

- The pipe will be removed by the backhoe and stockpiled separately on plastic sheeting. The contents of the pipe, if any, will be sampled every 30 feet and sent to an off-site fixed laboratory for full suite analyses. A one-week turnaround will be requested for analysis of the samples.
    - This is a deviation from the work plan which specifies that wipe samples will be collected from within the pipes and field screened for gross alpha, beta, and gamma radiation and organic vapors. The work plan calls for any sample with activity above action levels and/or the presence of organic contaminants and 50% of the remaining samples to be sent to an off-site fixed laboratory for analyses. The current proposed sampling is more conservative than that which the work plan suggested.
- Piping will be stockpiled separately to allow for appropriate waste disposal based on sample results.

Soil Sampling Immediately Under the Pipeline

- A soil sample will be collected every 30 feet from the soil immediately beneath the pipe. A one-week turnaround will be requested for analysis of the samples. (If the pipe is located shallower than 15 feet below ground surface the pipe will be excavated, and soil sampling will be conducted using a backhoe.)
    - This is a deviation from the work plan which specifies that these samples will be collected at 7 to 10 points in the excavated trench at intervals in which radioactivity or organic contaminants are detected above action levels. The work plan further states that all samples with positive field screen and 50% of the remaining samples will be sent to an off-site fixed laboratory for analyses. The current proposed sampling plan will collect as many, and perhaps more, samples than the work plan suggested and all

samples will be sent to an off-site laboratory instead of only 50% suggested by the work plan.

Soil Sampling 3 Feet Below the Pipeline

- Soil samples will be collected at the sample locations described above (every 30 feet). These soil samples will be held until the analytical results from the soil immediately under the pipeline are received. If those overlying samples indicate contamination is present, these soil samples will be analyzed for appropriate suites in order to determine extent. A one-week turnaround will be requested for analysis of the samples.
- This is a deviation from the work plan,which does not specify that these samples will be collected. These samples are being collected in order to determine extent.

If the pipe is less than 15 feet in depth, the following is planned:

- One to two feet of soil from beneath the pipe where the pipe had been will then be removed along the entire length of the excavated pipeline and stockpiled pending results of analyses.
- Soil from beneath the waste line will be used for backfill if sample results indicate no contamination is present. If sample results indicate contamination is present, extent of contamination will be delineated with additional samples, and a decision will be made as to whether or not the material is suitable for backfill.
- Soil underlying the excavated pipeline will be stockpiled separately for each day of excavation to allow sequential backfilling and restoration as sample results are received.
- Sampling will be initiated in the first section of trench when the pipe is removed and underlying soil is exposed. Additional samples will be taken as the excavation progresses. It is assumed that when the last section of piping is sampled, analytical results will be back for the samples collected from the first sections. Backfilling or appropriate disposal can then be undertaken.

Site Restoration

- Restoration to the area to be covered by LAMC's new wing will be limited since it will be highly disturbed during subsequent LAMC construction activities.

3.2.3.2 Activity 2 – Coring at ULR-33

ULR-33 was identified as a blow off installation, presumably just for the portion of the line in Los Alamos Canyon. It is expected that this installation was for use in draining the portion of the line in the canyon if it ever needed to be taken out of service for repairs. It is unknown if it was ever used for its intended purpose. Under normal operating conditions, the line was a totally closed system with no opportunities for leaks except at the flanged pipe connections.

There is no reason to believe that ULR-33 represented a more likely point of release than any other connection along the length of the pipeline. Thus, the proposed completion of five boreholes in the vicinity of ULR-33 as discussed in the work plan, all within ten feet of each other, is excessive. If this installation was the source of periodic releases, this could be determined with one, and certainly no more than two boreholes. Therefore, it is proposed that this activity be conducted essentially as it is written in the work plan with the deviation that two boreholes will be drilled instead of five.

3.2.3.3 Activity 2 – Coring at ULR-33

This activity will be conducted essentially as it is written in the work plan. The only deviation will be that instead of drilling 5 cores in the vicinity of ULR-33, 2 cores will be drilled instead.

4.0 SAMPLING ACTIVITIES AND ANALYTICAL METHOD

4.1 Sampling Activities

Confirmation soil/tuff samples will be collected using LANL-ER-SOP-09.06, Spade and Scoop Method for Collection of Soil Samples. Samples will be collected at the locations and depths outlined in Section 3.2. Once collected, each sample will be field-screened for worker health and safety purposes for gross alpha and beta/gamma radiation and organic vapors. Radiological field-screening methods for samples will consist of using a Ludlum 139 with a 43-4 air proportional probe and a Ludlum 2221 with a 43-1 zinc sulfide scintillation probe to detect gross alpha radiation and a Ludlum 2 with a 44-40 GM probe to detect gross beta/gamma radiation. A photo-ionization detector (PID) will be used to detect organic vapors. Equivalent detectors and instruments may be substituted as appropriate. Additional samples may be collected based on elevated worker safety radiological and/or organic vapor field screening results. After field-screening, samples will be submitted to the TA-21 radiological screening laboratory to address transportation

requirements. All samples will then be submitted to a fixed laboratory for analysis of target analyte list (TAL) metals, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), PCB and Pesticides, tritium, gamma spec and isotopic plutonium and uranium. TCLP analysis will be conducted for waste characterization purposes on an appropriate number of samples, depending on whether the presence of contamination is indicated by field conditions or analytical results from soil samples.

4.2 Analytical Methods

All samples will be analyzed at analytical laboratories using EPA SW-846 methods (EPA, July 1992) for inorganic and organic chemicals, and radiological separation and alpha spectroscopy for isotopic plutonium and isotopic uranium, gamma spectroscopy for radionuclides, and Liquid Scintillation Counting for tritium. Proposed analytical suites and methods are summarized in Table 4.2-1. Certain chemicals have low background values or screening values and therefore special detection limits must be specified. Special required detection limits for these chemicals are presented in Table 4.2-2.

Table 4.2-1

ANALYTICAL SUITES AND METHODS

FOR CHARACTERIZATION/CONFIRMATION SAMPLING

Analyte Suite	Analytical Laboratory Method
Inorganic Chemicals	
TAL Metals	SW-846 Methods 6010 (inductively coupled plasma emission spectroscopy), 6020 (graphite furnace atomic absorption), 7000 (inductively coupled plasma mass spectrometry), and 7470 (cold vapor atomic absorption)
TCLP	SW-846 Method 1311
Organic Chemicals	
SVOCs	SW-846 Method 8270 (gas chromatography/mass spectroscopy)
VOCs	SW-846 Method 8260 (gas chromatography)
PCBs/Pesticides	SW-846 Method 8081
Radionuclides	
Radionuclides	Gamma spectroscopy
Tritium	LSC (Liquid Scintillation Counting)
Isotopic Plutonium	Alpha spectroscopy
Isotopic Uranium	Alpha spectroscopy

TABLE 4.2-2

SPECIAL REQUIRED DETECTION LIMITS IN SOILS

Chemical	Minimum Detection Limit Required is _ or less than the following (mg/kg)
Antimony	0.5
Copper	4.0
Nickel	6.0
Selenium	0.3
Silver	1
Thallium	0.5

5.0 IMPLEMENTATION

5.1 Project Organization and Personnel

Table 5.1-1 shows the project organization and personnel for the SWMU 0-017 characterization/confirmation sampling.

TABLE 5.1-1
PROJECT ORGANIZATION AND PERSONNEL

Title	Name	Organization
Project Management		
Focus Area Leader	Roy Michelotti	EM/ER
Townsites Team Leader	Warren Neff	EM/ER
Field Team		
Field Team Leader (FTL)	Steve Calhoun	MK/PMC
Site Safety Officer (SS))/Radiation Screening Personnel (RSP)/ Alternate FTL	Clint Daymon	MK/PMC
Sampler	Randy Roybal	MK/PMC
Waste Manager (WM)	Mary Jane Winch	EM/ER

5.2 Project Schedule and Reporting

These sampling activities at SWMU 0-017 are scheduled to begin the first week in September, 1998. Additionally, LANL ER will notify NMED HRMB prior to actual field activities to accommodate the collection of split samples, if desired. Actual field activities are expected to require no more than 10 working days to complete.

The results of these sampling activities will be evaluated, summarized and submitted to NMED HRMB as soon as available; NMED HRMB can then immediately apprise the property owner of the results.

6.0 REFERENCES

DOE (Department of Energy), April 1979. "Formerly Utilized MED/AEC Sites Remedial Action Program, Removal of a Contaminated Industrial Waste Line, Los Alamos, New Mexico." Final Report.

EPA (Environmental Protection Agency), July 1992. "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Third Edition, Final Update 1, Office of Solid Waste and Emergency Response, Washington, D.C.

0781 LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1071," Los Alamos National Laboratory Report LA-UR-92-810, Los Alamos, New Mexico. **(LANL 1992, 0781) Verified.**

ENCLOSURE

RSI Response and Revised SAP
dated October 1998

Environmental Restoration
University of California
Environmental Restoration Project, MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504

Date: October 19, 1998
Refer to: EM/ER:98-424

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

SUBJECT: RESPONSE TO RSI ON THE SAP FOR PRS 0-017 (FORMER OU1071 FU 1)

Dear Mr. Garcia:

Enclosed (Enclosure 1) is Los Alamos National Laboratory's response to the New Mexico Environment Department Hazardous and Radioactive Materials Bureau's (HRMB) Request for Supplemental Information (RSI) on the Sampling and Analysis Plan (SAP) for Potential Release Site 0-017, dated September 16, 1998. The RSI was received on September 22, 1998.

Also enclosed (Enclosure 2) is the revised SAP for PRS 0-017 which is consistent with the responses provided. The first phase of work was completed on schedule, prior to the October 1, 1998 hospital construction start date. The field work substantiated the information presented at the August 31, 1998 meeting in Santa Fe that the depth of the waste line in the area east of the Los Alamos Medical Center (LAMC) is greater than 18 feet below ground surface. The second phase of field work, to investigate the waste line between the LAMC and the Health Research Laboratory is scheduled for later this month.

If you have any questions, please contact Warren Neff at (505) 665-9259 or Joe Mose at (505) 667-5808

Sincerely,

Julie A. Canepa, Program Manager
LANL/ER Project

Sincerely,

Theodore J. Taylor, Program Manager
DOE/LAAO

JC/TT/SP/se

Enclosures: 1) Response to RSI on the SAP for PRS 0-017
2) Revised SAP for PRS 0-017

Cy (w/ enc.):
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P. Longmire, CST-7, MS J534
R. Michelotti, CST-7, MS E525
J. Mose, LAAO, MS A316
W. Neff, CST-7, MS M992
S. Reneau, EES-1, MS D462
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EM/ER File, MS M992

Enclosure 1
To the
Request for Supplemental Information
For Potential Release Site 0-017

Response to
Request for Supplemental Information
SAP for Solid Waste Management Unit
0-017
October 1998

INTRODUCTION

This document responds to a letter titled, "Request for Supplemental Information 0-017 Sampling and Analysis Plan Los Alamos National Laboratory NM 0890010515," from the New Mexico Environment Department (NMED) Hazardous and Radioactive Materials Bureau (HRMB) to the Los Alamos National Laboratory (LANL) Environmental Restoration (ER) Project. To facilitate review of this response, NMED's comments are included verbatim. LANL's responses follow each NMED comment.

NMED Comment

1. ***Introduction and Scope, p.2***

LANL's statement "An ecotoxicological risk assessment will not be conducted because of the depth of the remaining piping and no viable pathways to receptors exist" is speculative. LANL should follow the reporting requirements of the RFI annotated outline and defer any decision regarding ecological risk assessment until analytical data has been obtained and evaluated.

LANL Response

1. The subject statement has been removed. The data from the analytical results will be evaluated in accordance with the State of New Mexico risk-based decision tree.

NMED Comment

2. ***Field Work, p. 3***

Provide analytical results and list of detected constituents, if any, from the decommissioning and demolition event in March 1991, where 26 feet of pipeline was excavated and removed. A map showing the portions of the pipeline which were removed (e.g., segment of Line 170 removed in March 1991) should be provided.

LANL Response

2. No samples were collected for fixed laboratory analytical testing, and field screening results could not be located. As stated, 26 feet of line was removed starting at the face of HRL-1. The opening at the building and the exposed pipe at the 26-foot disconnected end were capped with concrete. The remainder of the line runs in an easterly direction (N55°E) to manhole ULR-61. Only that portion (26 feet) of the line was removed that was considered necessary to complete construction of the HRL addition and to reroute utilities in this area. For the RFI investigation, samples will be collected as close as possible to the disconnect point. In addition, a detailed site map shall be provided showing the removed line, remaining line, sampling locations, etc. at the conclusion of the RFI investigation.

NMED Comment

3. ***Sampling Approach/Design, Task 1, p. 4***

LANL should prepare and submit a detailed site map showing the pipelines (segments which were removed and the segments which were left in place) and associated structures, for the entire SWMU as stated in the work plan. The map should show the relationship of all pipelines, manholes etc. and indicate the proposed sampling locations (including vertical sample/screening intervals), and soil boring depths. Where appropriate, LANL should bias sampling/screening locations based on observed stains or breaks in the pipeline.

LANL states that radiological survey will not be conducted for the aboveground lines because they are no longer in existence. Contamination could still be present at the locations even though the pipelines have been removed in the past. A radiological survey should be conducted at these locations to determine if any contamination still exists.

LANL Response

3. A site survey shall be completed as specified in the Work Plan, including a detailed site map showing the remaining sections of waste line and associated structures, and sampling locations. A cross-section shall be prepared showing pipe depths with respect to sampling locations. Bias sampling will be conducted, based on location of VCP pipe joints and common length of VCP pipe segments, location of ULR-61, etc.

For former Line 167 located in Los Alamos Canyon a radiological survey will be conducted. The survey shall examine the areas immediately surrounding the in-place concrete anchors as well as the areas between each anchor where the pipe was formerly located. Based on the results of the radiological survey, up to four areas that exhibit contamination (elevated readings above background) based on radiological screening will be selected for soil sampling. If the radiological survey does not indicate areas of contamination, then two locations will be selected at random on each side of the canyon for sampling; the soil/tuff interface will be sampled at the down-slope location of the base of the concrete anchors that still exist.

NMED Response

4. Sampling Approach/Design, Task 2, p. 4

LANL states that Line 167 was removed from the north and south sides of Los Alamos Canyon but does not address the portion of the pipeline across the floor of the canyon. Clarify if that segment was removed or left in place. Provide results of the samples collected between the anchors and removed pipe. This data might be useful to identify additional contaminants of concern. Provide results of any human health and ecological risk screening/assessment if conducted.

LANL Response

4. The portion of Line 167 that ran across the canyon floor was removed, along with ULR-33 during the 1981-1986 liquid waste lines removal project.

Guidelines for residual radioactivity concentrations in soil after removal of waste lines and structures were based on the general prinicple of as low as reasonably achievable (ALARA). Memorandums documenting the removal of Line 167 state that samples were taken between the anchors, and all samples were below established Industrial Waste Line (IWL) guidelines (<25 pCi/g). Embedded alpha activity inside the pipe was <400dpm/100 cm2. Beta-gamma activity were at background levels.

NMED Comment

5. Sampling Approach/Design, Task 2, p. 5

LANL should review and evaluate existing documentation and data before performing additional sampling and removal of the pipeline sections and anchors. The conclusions of this evaluation should be addressed in the final report.

LANL Response

5. Based on existing documentation and data, all that remains of Line 167 are concrete anchors (average size 2' x 3' x 6') with approximately 3 feet of 3-inch diameter cast iron pipe encased within. All other portions of Line 167 were removed, including the portion that ran along the bottom of the canyon and ULR-33 as well. A radiological survey will be performed along the north and south walls of the canyon where Line 167 formerly traversed, and around each of the concrete anchors. Based on results of the survey, hand auger samples (up to four samples) will be collected at areas of elevated radioactivity. If no elevated readings are observed, samples will be collected at the down slope side of two concrete anchors on each side of the canyon.

NMED Comment

6 Subsurface Sampling, Construction Activities, p. 6

LANL states in the second bullet that clean soil removed from above the pipeline will be stockpiled and later used for backfilling. Explain how the soil will be determined to be "clean".

LANL Response

6. It is anticipated the material removed from above the pipe in these exploratory trenches will be clean fill material. On site instruments will be used to field screen the materials for gross alpha, beta, gamma and a PID for organic vapors. If elevated readings are not detected during screening, then the soil will be returned to the excavation at approximately the same depth as it was originally excavated from.

NMED Comment

7. ***Excavation and Disposal of Pipe, p. 6***

LANL proposes to leave the pipeline in place if found at depths greater than 15 feet. Provide a map with the location of trenches and sampling depths. Clarify if the contents of pipeline to be left in place will be investigated. Institutional controls may be required if the analyses indicate the presence of contamination in the pipeline and the pipeline is to be left in place.

LANL should clarify if wipe samples will be taken if no contents are found inside the removed pipeline.

LANL should provide estimates of the volume of waste to be generated and outline plans for characterization and disposal of the waste.

LANL is planning to conduct soil sampling using a backhoe bucket if the pipeline is located at depths less than 15 feet. This would result in composite samples. LANL should take discrete samples using a backhoe mounted sampler at 30 feet intervals and bias the sampling efforts towards any observed stained areas, breaks in the pipe, or elevated field screening results.

LANL Response

7. A final map will be provided showing the location of trenches, boring location sample points, and location of pipe. At locations of the line where trenches are excavated, the pipe will be accessed and the contents will be sampled. If material of sufficent volume cannot be collected, then wipe samples of the interior of the pipe will be collected and tested for alpha, beta, and gamma activity.

The volume of waste generated is anticipated to be very small. Preliminary data indicate the pipe is greater than 15 feet in depth. Therefore, based on this scenario, the pipe will be left in the ground and volume of soil excavated will be minimized. Field screening and swipe samples will be used to characterize the soil and any pipe fragments that may be removed by the backhoe.

Using proper backhoe and sampling techniques, grab samples can still be collected from within the backhoe bucket. This is a commonly accepted practice when performed properly. When samples are to be collected, the backhoe operator will excavate a backhoe bucket from the appropriate depth interval the sample is to be collected from. The sampler will obtain a volatile organic sample before collecting soil for any of the other parameters to be tested for. From a portion of the bucket that is least disturbed the sampler will collect enough material from which to fill the required sample container. Once the volatile organic sample has been secured, material will be placed in a stainless steel bowl for homogenizing, for collection of the remaining parameters. Material will not be collected that is in contact with the sides of the backhoe bucket. Every effort will be made to collect samples that are representative of the material in the trench.

NMED Comment

*8. **Soil Sampling 3 Feet Below the pipeline, p.7***

LANL proposes to collect samples 3 feet below the pipeline and to analyze these samples if there is an indication that contamination is present in samples immediately beneath the pipeline. This will help to determine the vertical extent of contamination only; it would not address the lateral extent of contamination in the trench.

LANL should sample at the fill/tuff interface in addition to samples taken at 3 feet if the interface is located deeper than 3 feet. Soil/tuff interface should be screened prior to sampling.

Additionally, LANL should ensure that the verification samples (which are to be held till the results of samples taken immediately under the pipe are reviewed) are analyzed within their prescribed holding times for relevant analyses.

LANL should clarify if the material below the vitrified clay pipe (VCP) is fill or soil that was not disturbed and use appropriate values for background comparisons.

Provide rationale for excavating one to two feet of soil beneath the pipeline and then using it for backfill if sample results indicate no contamination. It would be more appropriate and cost-effective to wait for the sample results and then decide whether contamination needs to be delineated and the soil from beneath the pipeline needs to be excavated.

LANL has discussed what it intends to do with soil removed from beneath the pipeline but has not address the soil which would be removed from above the pipeline. What criteria would be used to characterize the soil and how does LANL propose to dispose of it, if found contaminated.

LANL Response

8. Based on site geology, depth of waste line, and trench geometry, it is known that the depth of the pipeline is below the top of tuff. That is, it is buried by backfill material in a trench cut into the weathered tuff at the site. If contamination is found to occur in this setting, the preferred direction of contaminant migration will be along the trench axis. Therefore the sampling along the line at 30 foot intervals will assist in defining lateral migration of potential contamination.

As previously stated, the pipeline is located within a trench cut into tuff. Based on early site investigation, there is very little fill material between the bottom of the pipe and the bottom of the excavation (tuff). Therefore, the sample collected from immediately beneath the pipe will be a fill/tuff interface sample. Deeper samples will be composed entirely of tuff. All sample intervals will be screened prior to sampling.

The first phase of investigation, which is located in the parking lot east of the LAMC addition, is intended to be completed prior to the October 1, 1998 start of hospital construction. All samples that are collected will be sent to the laboratory and analyzed. For the investigation west of the LAMC addition, in the parking lot between the LAMC and the HRL, the confirmation samples (collected approximately 3 feet under the pipe) will be sent to the laboratory with the primary samples (collected immediately under the pipe), and a decision will be made upon review of faxed results from the lab, whether to analyze the confirmation samples. This will minimize delays and help prevent exceeding holding times for the confirmation samples.

Based on preliminary investigation data, the pipe is located within a trench cut into tuff at a depth of 18 to 19 feet. There appears to be minimal backfill under the pipe. Appropriate values will be used for background comparisons.

One to two feet of soil was only to be excavated if the pipe was less than 15 feet deep. The reason that it was to be removed at the same time as the pipeline was because of the October 1 hospital construction start date. The other areas of the line are not impacted by hospital construction; therefore overexcavation of the pipeline can be delayed pending analytical results. However, based on initial fieldwork at the site, the pipe is greater than 18 feet and overexcavation is not an issue.

The soil above the pipeline is fill material and is not expected to be contaminated. The pipeline was a gravity line that was laid in a trench cut into tuff; it was not under pressure and therefore no leaks would be expected above the pipe. However, the material above the pipe that is excavated will be screened with instruments in the field. If readings with the instruments, or visual observation of contamination is noted, then samples will be collected for fixed lab analysis and disposition determined based on analytical results.

NMED Comment

9. ***Site Restoration, p. 8***

Provide rationale for the statement in paragraph 2 which says that ULR-33 does not represent a more likely point of release if its intended purpose was to drain into Los Alamos canyon or provide documentation showing that it was never used for this purpose.

Field screening technologies such as field portable X-ray fluorescence may be useful in identifying potential contamination and citing an appropriate number of boreholes.

LANL Response

9. The subject statement is speculative and will be removed. Documentation regarding the use of ULR-33 cannot be provided. ULR-33 was removed as part of the Acid Waste Line Removal Project, along with Line 167

Radiological surveys will be used to make determinations on location and depth of borings and/or sampling locations.

NMED Comment

*10. **Sampling Activities, p. 9***
Provide a list of radionuclides to be analyzed by gamma spectroscopy with their respective minimum detection limits.

LANL should include Sr-90, C-14 and cyanide as contaminants of potential concern or provide rationale for not including them. Sr-90, C-14 and cyanide were identified as potential contaminants of concern in the RFI Work Plan for Operable Unit 1136 which contains TA-43, Health Research Laboratory building, the origination point of these pipelines.

LANL Response

10. The list of radionuclides measured by gamma spectroscopy that are potential historical contaminants are as follows: Am-241, Co-57, Co-60, Cs-134, Cs-137, Eu-152, Na-22, and Ru-106. The contract lab is required to meet minimum detectable activities for three key analytes: Am-241 (1.0 pCi/g), Cs-137 (0.1 pCi/g), and Co-60 (0.5 pCi/g). The contract lab then reports the minimum detectable activity for each radionuclide measured on a batch-specific basis.

The RFI Work Plan for OU 1136 does list Sr-90, C-14 and cyanide as potential contaminants of concern, however only cyanide was specified to be included as an analyte.

The RFI Work Plan for OU 1071 which discusses the actual work covered in this investigation did not specify that analysis be performed for Sr-90, C-14 or cyanide. Both C-14 and Sr-90 are beta emitters and therefore their presence as such may be determined by the gross beta scan that will be conducted. Quantities of these materials used at the HRL were generally in the micro-liter range and were not flushed down the drains but were removed as rad wastes. In addition, the SAL in soil for C-14 is 4.7×10^5 pCi/g, and given the reported micro-liter quantities used, the rationale for including it as an analyte is questionable.

NMED Comment

11. ***Table 4.2-1, p. 10***

LANL should use SW-846 5000 series method for the field preparation of volatile organic compounds.

LANL Response

11. This is a programmatic issue which cannot be addressed in the context of this RFI investigation or the RSI process. The ER Project is investigating how best to implement Method 5035 for analysis of volatile organic compounds in soil and tuff samples. LANL would welcome an opportunity to discuss a technical approach with NMED personnel in the near future.

Enclosure 2
To the
Request for Supplemental Information
For Potential Release Site 0-017

SAMPLING AND ANALYSIS PLAN
FOR
THE RCRA FACILITY INVESTIGATION AT
POTENTIAL RELEASE SITE 0-017
WASTE LINES 170 AND 171

Los Alamos National Laboratory

Environmental
Restoration
Project

September 1998

1.0 INTRODUCTION AND SCOPE

This sampling and analysis plan (SAP) addresses the RCRA Facility Investigation (RFI) sampling activities associated with the Solid Waste Management Unit (SWMU) 0-017, waste lines 170 and 171. The site is located in former Technical Area (TA) –0, in the current Los Alamos Medical Center (LAMC) area (see Figure 1.0-1). Line 170 is a 200 foot section of pipe running east of the Health Research Laboratory (HRL-1) under the lawn and parking lot to Manhole ULR-61. Line 171 is a 365 foot section of pipe running east from Manhole ULR-61 under the LAMC North Wing and under the hospital parking lot to the location of the former Manhole ULR-60 (removed in 1977). Lines 170 and 171 constituted a branch line serving the HRL and entered the Acid Waste Lines downgradient of ULR-60, that carried waste to the TA-45 treatment plant. After 1963 these lines were disconnected and reconnected within the building to the sanitary system. Work was done at the HRL-1 with low quantities of radioisotopes carbon-14, tritium, plutonium-238, plutonium-239, polonium-210, uranium-238, uranium-239, promethium and thorium. Major chemical wastes were alcohols (ethyl, methyl, and butyl), fluorescent dyes ethidium bromide and propidium iodide. As was general practice the radioisotopes were disposed of as radiation waste, while the chemicals were disposed of as chemical waste.

Lines 170 and 171 are being recommended for sampling because the LAMC will be conducting construction activities in the immediate area commencing October 1, 1998. The sampling activities outlined below focus on collecting confirmation samples from beneath the pipelines. Pipe construction is vitrified clay pipe (VCP), based on engineering drawing specifications. Depth to the pipe varies from 18 to 20 feet below the current grade, again based on the original engineering drawings and recent surveying. The data from the analytical results will be evaluated in accordance with the State of New Mexico risk-based decision tree. The purpose of this abridged SAP is to expedite the sampling effort associated with the waste lines, which are located on private property, so that field work may be completed prior to the scheduled private development of the site and commencement of construction activities. Work will be conducted in a phased approach, with the area scheduled for hospital construction scheduled first. Based on results of this initial investigation (i.e. location and depth of pipe,

analytical data, etc.) the investigation approach to the remaining line will be evaluated.

2.0 RCRA FACILITY INVESTIGATION RESULTS

2.1 Field Work

In 1977, prior to impending major road construction, some industrial waste line segments and manholes were removed. A portion of this activity included:

- Excavation and removal of manhole ULR-60.

The results of these field activities (DOE, 1979) and data evaluation indicate that Manhole ULR-60 was contaminated inside with approximately 50 pCi/g Pu-238, 2,560 pCi/g Pu-239, 235 pCi/g Am-241, and 340 pCi/g Cs-137. After removal, gross alpha analyses of soil samples were all less than or equal to 25 pCi/g. The inlet pipe from the HRL had no detectable activity and was sealed with a concrete plug. No analyses were conducted for analytes other than radionuclides. Up to 400 pCi/g gross-alpha activity was found in the inlet/outlet pipe at the base of ULR-61. The inlet and outlet pipes were sealed with cement and the structure left in place. The waste line section between ULR-60 and ULR-61 was left in place as well.

In March 1991, a portion of line 170 was removed in a decommissioning and demolition (D&D) event. This activity included:

- Excavation and removal of twenty-six feet of line beginning at the face of HRL-1 and continuing in the eastern direction. Only enough line was removed to complete the construction of the HRL addition and to reroute utility lines in this area

No fixed lab analytical data are available for the 1991 work effort.

- **Reporting Requirements**

The reporting requirements associated with SWMU 0-017 are summarized chronologically in Table 2.2-1.

Table 2.2-1
CHRONOLOGICAL SUMMARY OF REPORTING REQUIREMENTS

DOCUMENT	DATE	SUMMARY
OU 1071 Work Plan	May 1992	LANL submits work plan to EPA
Approval Letter	Received January 6, 1993	EPA gives approval to OU 1071 Work Plan

3.0 SAMPLING OBJECTIVE AND APPROACH/DESIGN

3.1 SAMPLING OBJECTIVE

The objective of this investigation is to verify the location and depth of waste line, to determine nature, rate, and extent of potential contamination by sampling beneath and within the waste line, and to determine potential risk. The results of the analytical and risk data, along with consideration of depth and access constraints, will be used to determine if the lines (170 and 171) should be excavated or left in place.

3.2 SAMPLING APPROACH/DESIGN

The 1992 RFI Work Plan for Operable Unit 1071 was developed jointly with the Environmental Protection Agency (EPA) Region 6. The goal was to ensure that these sites present no hazards that could constrain future use of the properties on which they are located. This sampling approach is intended to implement the

RFI Work Plan. Three tasks are described in the RFI Work Plan: Task 1 – Field Surveys, Task 2 – Surface Sampling, and Task 3 – Subsurface Sampling.

3.2.1 TASK 1 – FIELD SURVEYS

Three activities are described in the work plan under Task 1. Activity 1 – Site Survey will be conducted as specified in the plan including a detailed site map showing the remaining sections of the waste lines and associated structures. Activity 2- Geophysical Surveys will not be conducted because the pipeline is made of clay and is at a depth that geophysics would not provide conclusive data. Activity 3 – Radiological Survey will be conducted in conjunction with the subsurface sampling, but not with respect to aboveground lines, as the referenced aboveground lines (Line 167) are no longer in existence (see section 3.2.2

3.2.2 TASK 2 – SURFACE SAMPLING OF ABOVEGROUND LINES AND ANCHORS

Two memos (Cox, 1984, ER ID 30811) and (Montoya,1985, ER ID 7295) and a report (Elder, 1986), provide details of how Line 167 was removed from the north and south sides of Los Alamos Canyon. This activity was associated with a larger liquid waste line removal project conducted between 1981 to 1986. Line 167 under the canyon floor and ULR 33 were also removed at this time. To summarize the side canyon removals, the three-inch cast iron pipe was cut on each side of the concrete anchors and the sections between the anchors were removed. The approximately three foot-long section of pipe encased within each anchor was decontaminated and the ends were sealed with concrete. The concrete anchors were then buried with fill material to a depth of one foot above the encased pipe. The removed pipe and soil samples collected between the anchors were screened for gross alpha, beta, and gamma radiation. All samples were below established IWL guide lines (<25 pCi/g). Embedded alpha activity inside the pipe was less than 25 pCi/g. Beta-Gamma activity were at background levels.

Based on a preliminary site survey, it was confirmed that Line 167 was removed, that the concrete anchors are still in place, and that the ends of the encased pipes are plugged with concrete as documented in the referenced memos.

Removal and wipe sampling of the remaining three-foot sections of above ground pipe will not be completed as discussed in the work plan because the pipe was decontaminated and plugged with concrete, and is encased in the concrete anchors as confirmed by the preliminary site survey. It is proposed that documentation from the Line 167 removal be obtained to document existing contamination levels at the time the pipe was removed, and that the current condition of the concrete anchors be documented with photographs. Subsurface sampling will be performed as discussed in section 3.

3.2.3 TASK 3 – SUBSURFACE SAMPLING

Two activities are described in the work plan under Task 3. Activity 1 – Sampling and Removal of Buried Lines and Activity 2 – Coring at ULR-33.

3.2.3.1 Activity 1 – Sampling and Removal of Buried Lines

This activity is described in the work plan in three steps: site preparation, field screening and removing lines, and sampling material beneath the lines. Work plan activities may not have realized the actual depths of waste line burial. Research of engineering drawings and collection of survey data indicate that lines 170 and 171 may be buried at depths of 18 to 20 feet (see Figure 3.2.3.1-1). Given excavation equipment limitations, side slope stabilities and size of excavation and minimization of foundation damage to existing structures by maintaining safe distances, it may not be feasible to remove the remaining line segments as originally proposed in the work plan. Therefore, the following deviation is proposed.

Site Preparation

- End points of the line and approximate route and depth will be located by surveying.
- The parking lot east of the North Wing of LAMC (site of proposed construction of new wing) will be closed, fenced off, and posted.

Field Activities

Construction Activities

- A backhoe will be used to excavate two exploratory trenches (one at each end of the line) to verify depth. A trackhoe will be available from the excavation contractor in case the waste line is deeper than the backhoe can excavate.
- Clean soil removed from above the waste line will be stockpiled within the fenced area and later returned to the excavation during backfilling. During all soil excavation activities, soils will be screened with available site instruments (Ludlum 139 with a 43-4 air proportional probe, a Ludlum 221 with a 43-1 GM zinc sulfide scintillation probe, a Ludlum 2 with a 44-40 GM probe, and a photo-ionization detector or equivalent detectors and instruments) to determine nature and presence of potential contamination, and to determine final disposition of soil.

Excavation and Disposal of Pipe

All data indicate the piping is greater than 15 feet deep and will therefore be left in place. It is assumed that the depth of the pipe is below the soil/tuff interface, and therefore samples at this boundary will not be collected.

- The portion of the pipe exposed by the backhoe in the exploratory trenches will be removed and stockpiled separately on plastic sheeting. The contents inside the pipe will be sampled and sent to an off-site fixed laboratory for full suite analyses. A one-week turnaround will be requested for analysis of the samples.
- This is a deviation from the work plan which specifies that wipe samples will be collected from within the pipes and field screened for gross alpha, beta, and gamma radiation and organic vapors. The work plan calls for any sample with activity above action levels and/or the presence of organic contaminants and 50% of the remaining samples to be sent to an off-site fixed laboratory for analyses. The current proposed sampling is more conservative than that which the work plan suggested.
- Piping will be stockpiled separately to allow for appropriate waste disposal based on sample results.

Soil Sampling Immediately Under the Pipeline

- A drill rig will be used to collect soil samples every 30 feet from the soil immediately beneath the pipe. An attempt will be made to space the sampling points at pipe joint locations. A one-week turnaround will be requested for analysis of the samples

- This is a deviation from the work plan which specifies that these samples will be collected at 7 to 10 points in the excavated trench at intervals in which radioactivity or organic contaminants are detected above action levels. The work plan further states that all samples with positive field screen and 50% of the remaining samples will be sent to an off-site fixed laboratory for analyses. The current proposed sampling plan will collect as many, and perhaps more, samples than the work plan suggested and all samples will be sent to an off-site laboratory instead of only 50% suggested by the work plan.

Soil Sampling 3 Feet Below the Pipeline

- A drill rig will be used to collect soil samples at the sample locations described above (every 30 feet). These soil samples will be shipped and held by the contract laboratory until the analytical results from the soil immediately under the pipeline are received (5-day turnaround). If those overlying samples indicate contamination is present, these soil samples will be analyzed for appropriate suites in order to determine vertical extent of potential contamination. Lateral extent of potential contamination will be achieved by sampling along the pipe length (every 30 feet) and perpendicular to the pipe if necessary. A one-week turnaround will be requested for analysis of the samples.
- This is a deviation from the work plan, which does not specify that these samples will be collected. These samples are being collected in order to determine extent.

If the pipe is less than 15 feet in depth, the following is planned:

- A backhoe will be used to excavate down to the waste line. Clean soil removed from above the waste line will be stockpiled within the fenced area and later returned to the excavation (based on field screening) during backfilling.

- The pipe will be removed by the backhoe and stockpiled separately on plastic sheeting. The contents of the pipe, if any, will be sampled every 30 feet and sent to an off-site fixed laboratory for full suite analyses. A one-week turnaround will be requested for analysis of the samples.
- Piping will be stockpiled separately to allow for appropriate waste disposal based on sample results.
- One to two feet of soil from beneath the pipe where the pipe had been will then be removed along the entire length of the excavated. Soil will be stockpiled separately for each day of excavation to allow sequential backfilling and restoration as sample results are received. Soil samples will be collected at the same frequency and locations as stated above.
- Soil from beneath the waste line will be used for backfill if sample results indicate no contamination is present. If sample results indicate contamination is present, extent of contamination will be delineated with additional samples collected at the same sampling intervals as specified above, and a decision will be made as to whether or not the material is suitable for backfill.
- Sampling will be initiated in the first section of trench when the pipe is removed and underlying soil is exposed. Additional samples will be taken as the excavation progresses. It is assumed that when the last section of piping is sampled, analytical results will be back for the samples collected from the first sections. Backfilling or appropriate disposal can then be undertaken.

Site Restoration

- Restoration to the area to be covered by LAMC's new wing will be limited since it will be highly disturbed during subsequent LAMC construction activities.

3.2.3.2 Activity 2 – Coring at ULR-33

ULR-33 was identified as a blow off installation, presumably just for the portion of the line (167) in Los Alamos Canyon (see Figure 3.2.3.2-1). It is expected that this installation was for use in draining the portion of the line in the canyon if it ever needed to be taken out of service for repairs. It is unknown if it was ever used for its intended purpose. Under normal operating conditions, the line was a totally closed system with no opportunities for leaks except at the flanged pipe

connections. Manhole ULR 33 was removed from the bottom of the canyon in 1981 as part of the Townsite work.

Thus, the proposed completion of five boreholes in the vicinity of ULR-33 as discussed in the work plan, all within ten feet of each other, is excessive. If this installation was the source of periodic releases, this could be determined with one, and certainly no more than two boreholes. Therefore, it is proposed that this activity be conducted essentially as it is written in the work plan with the deviation that two boreholes will be drilled instead of five.

This activity will be conducted essentially as it is written in the work plan. The only deviation will be that instead of drilling 5 cores in the vicinity of ULR-33, 2 cores will be drilled instead. The location of the two proposed borings are on the upgradient (inlet) and downgradient (outlet) portion of the line, as these are deemed the most likely areas where potential leaks could have occurred. The total depth of the borings will be 10 feet; if visual and/or field screening determines that the borings are still in contamination at 10 feet, a field decision will be made to drill deeper in order to define the vertical extent of contamination. Lateral extent will be defined by locating offset borings a minimum of 10 feet from the previous boring to define lateral extent of contamination.

Additional subsurface sampling is proposed as part of this activity. Two anchor locations that secured Line 167 will be selected on each side of Los Alamos Canyon for hand auger sampling. A sample will be collected from the soil/tuff interface on the downslope side of the concrete anchor and analysed for the full suite of analytes. Determination of exact sample location will be made in the field and be based on a radiological survey.

4.0 SAMPLING ACTIVITIES AND ANALYTICAL METHOD

4.1 Sampling Activities

Confirmation samples will be collected using LANL-ER-SOP-04.01 Drilling Methods and Drill Site Management, and LANL-ER-SOP-06.26 Core Barrel Sampling for Subsurface Earth Materials. Samples will be collected at the locations and depths outlined in Section 3.2. Once collected, each sample will

be field-screened for worker health and safety purposes for gross alpha and beta/gamma radiation and organic vapors. Radiological field-screening methods for samples will consist of using a Ludlum 139 with a 43-4 air proportional probe and a Ludlum 2221 with a 43-1 zinc sulfide scintillation probe to detect gross alpha radiation and a Ludlum 2 with a 44-40 GM probe to detect gross beta/gamma radiation. A photo-ionization detector (PID) will be used to detect organic vapors. Equivalent detectors and instruments may be substituted as appropriate. Additional samples may be collected based on elevated worker safety radiological and/or organic vapor field screening results. After field-screening, samples will be submitted to the TA-21 radiological screening laboratory to address transportation requirements. All samples will then be submitted to a fixed laboratory for analysis of target analyte list (TAL) metals, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), PCB and Pesticides, tritium, gamma spec and isotopic plutonium and uranium. TCLP analysis will be conducted for waste characterization purposes on an appropriate number of samples, depending on whether the presence of contamination is indicated by field conditions or analytical results from soil samples.

4.2 Analytical Methods

All samples will be analyzed at analytical laboratories using EPA SW-846 methods (EPA, July 1992) for inorganic and organic chemicals, and radiological separation and alpha spectroscopy for isotopic plutonium and isotopic uranium, gamma spectroscopy for radionuclides, and Liquid Scintillation Counting for tritium. Proposed analytical suites and methods are summarized in Table 4.2-1. Certain chemicals have low background values or screening values and therefore special detection limits must be specified. Special required detection limits for these chemicals are presented in Table 4.2-2.

Table 4.2-1
ANALYTICAL SUITES AND METHODS
FOR CHARACTERIZATION/CONFIRMATION SAMPLING

Analyte Suite	Analytical Laboratory Method
Inorganic Chemicals	
TAL Metals and Cyanide	SW-846 Methods 6010 (inductively coupled plasma emission spectroscopy), 6020 (graphite furnace atomic absorption), 7000 (inductively coupled plasma mass spectrometry), and 7470 (cold vapor atomic absorption)
TCLP	SW-846 Method 1311
Organic Chemicals	
SVOCs	SW-846 Method 8270 (gas chromatography/mass spectroscopy)
VOCs	SW-846 Method 8260 (gas chromatography)
PCBs/Pesticides	SW-846 Method 8081
Radionuclides	
Radionuclides	Gamma spectroscopy
Tritium	LSC (Liquid Scintillation Counting)
Isotopic Plutonium	Alpha spectroscopy
Isotopic Uranium	Alpha spectroscopy

NA – not available

TABLE 4.2-2

SPECIAL REQUIRED DETECTION LIMITS IN SOILS

Chemical	Minimum Detection Limit Required is = or less than the following (mg/kg)
Antimony	0.5
Copper	4.0
Nickel	6.0
Selenium	0.3
Silver	1
Thallium	0.7

5.0 IMPLEMENTATION

5.1 Project Organization and Personnel

Table 5.1-1 shows the project organization and personnel for the SWMU 0-017 characterization/confirmation sampling.

TABLE 5.1-1
PROJECT ORGANIZATION AND PERSONNEL

Title	Name	Organization
Project Management		
Focus Area Leader	Roy Michelotti	EM/ER
Townsites Team Leader	Warren Neff	EM/ER
Field Team		
Field Team Leader (FTL)	Steve Calhoun	MK/PMC
Site Safety Officer (SS))/Radiation Screening Personnel (RSP)/ Alternate FTL	Clint Daymon	MK/PMC
Sampler	Randy Roybal	MK/PMC
Waste Manager (WM)	Mary Jane Winch	EM/ER

5.2 Project Schedule and Reporting

These sampling activities at SWMU 0-017 are scheduled to begin the first week in September, 1998. Additionally, LANL ER will notify NMED HRMB prior to actual field activities to accommodate the collection of split samples, if desired.

Actual field activities are expected to require no more than 10 working days to complete.

The results of these sampling activities will be evaluated, summarized and submitted to NMED HRMB as soon as available; NMED HRMB can then immediately apprise the property owner of the results.

6.0 REFERENCES

Cox, J., July 1984. " Line 167: Concrete Anchors Left in Place on North Side of Los Alamos Canyon." Los Alamos National Laboratory, Memorandum.

DOE (Department of Energy), April 1979. "Formerly Utilized MED/AEC Sites Remedial Action Program, Removal of a Contaminated Industrial Waste Line, Los Alamos, New Mexico." Final Report.

Elder, J.C., Cox, E.J., Hohner, D.P., Valentine, A.M., 1896. "Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981-1986)." Los Alamos Report LA-10821-MS (September 1986).

EPA (Environmental Protection Agency), July 1992. "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Third Edition, Final Update 1, Office of Solid Waste and Emergency Response, Washington, D.C.

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1071," Los Alamos National Laboratory Report LA-UR-92-810, Los Alamos, New Mexico.

Montoya, G., November 1995. "Line 167: Concrete Anchors Left in Place on South Side of Los Alamos Canyon." Los Alamos National Laboratory, Memorandum.

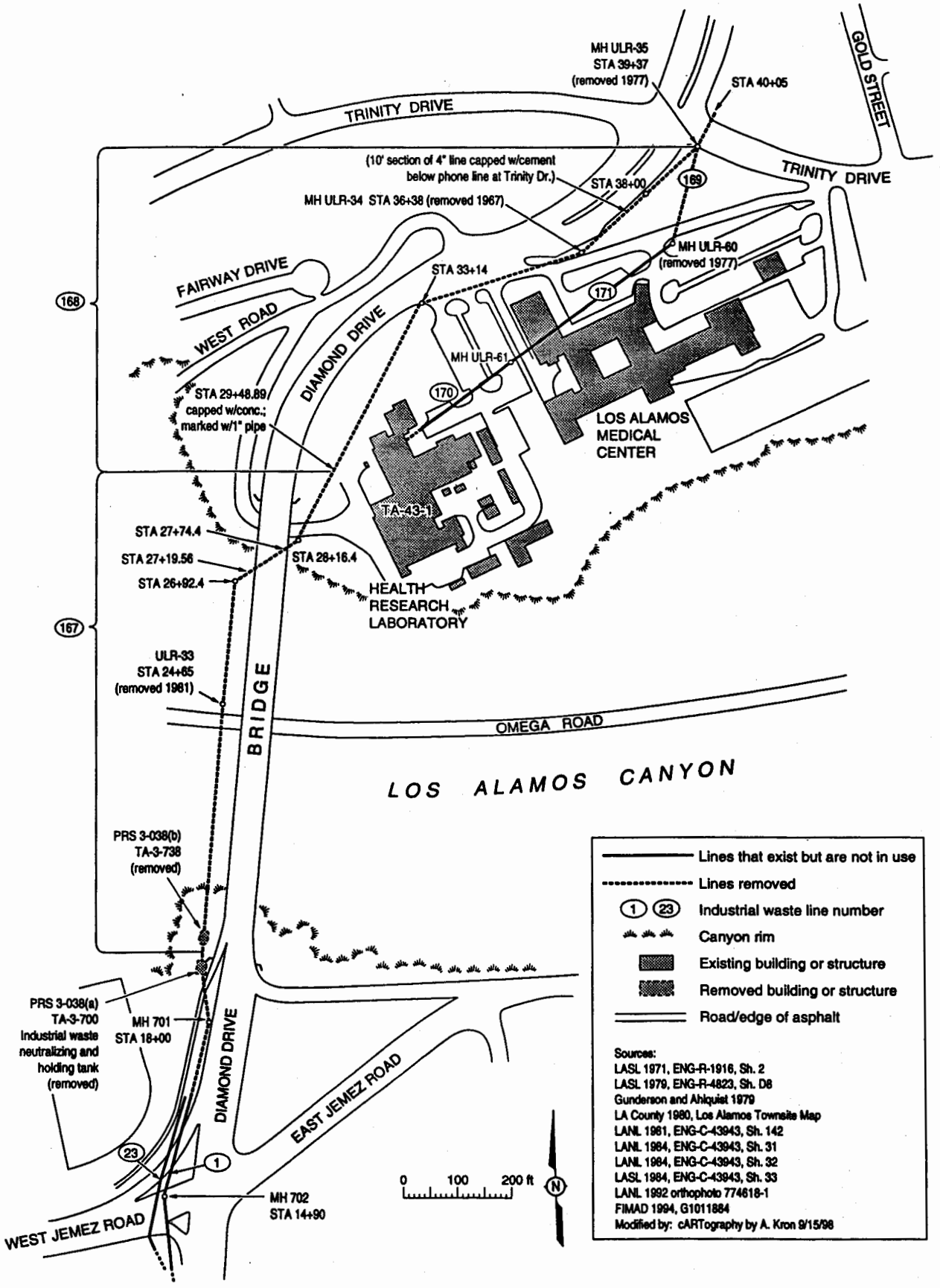

Figure 1.0-1 Location of PRS 0-017 waste lines.

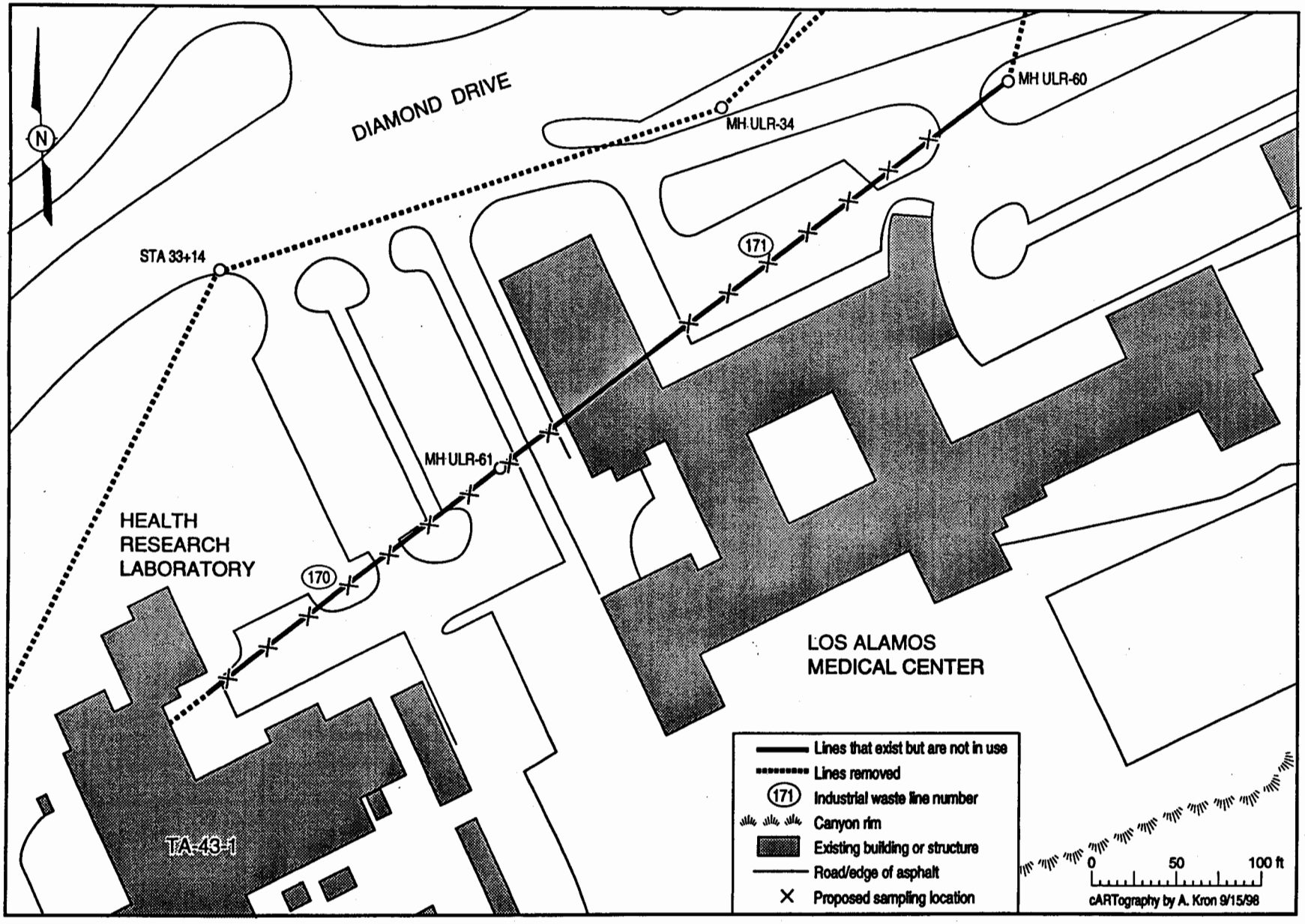

Figure 3.2.3.1-1 Proposed sampling locations for hospital portion of PRS 0-017.

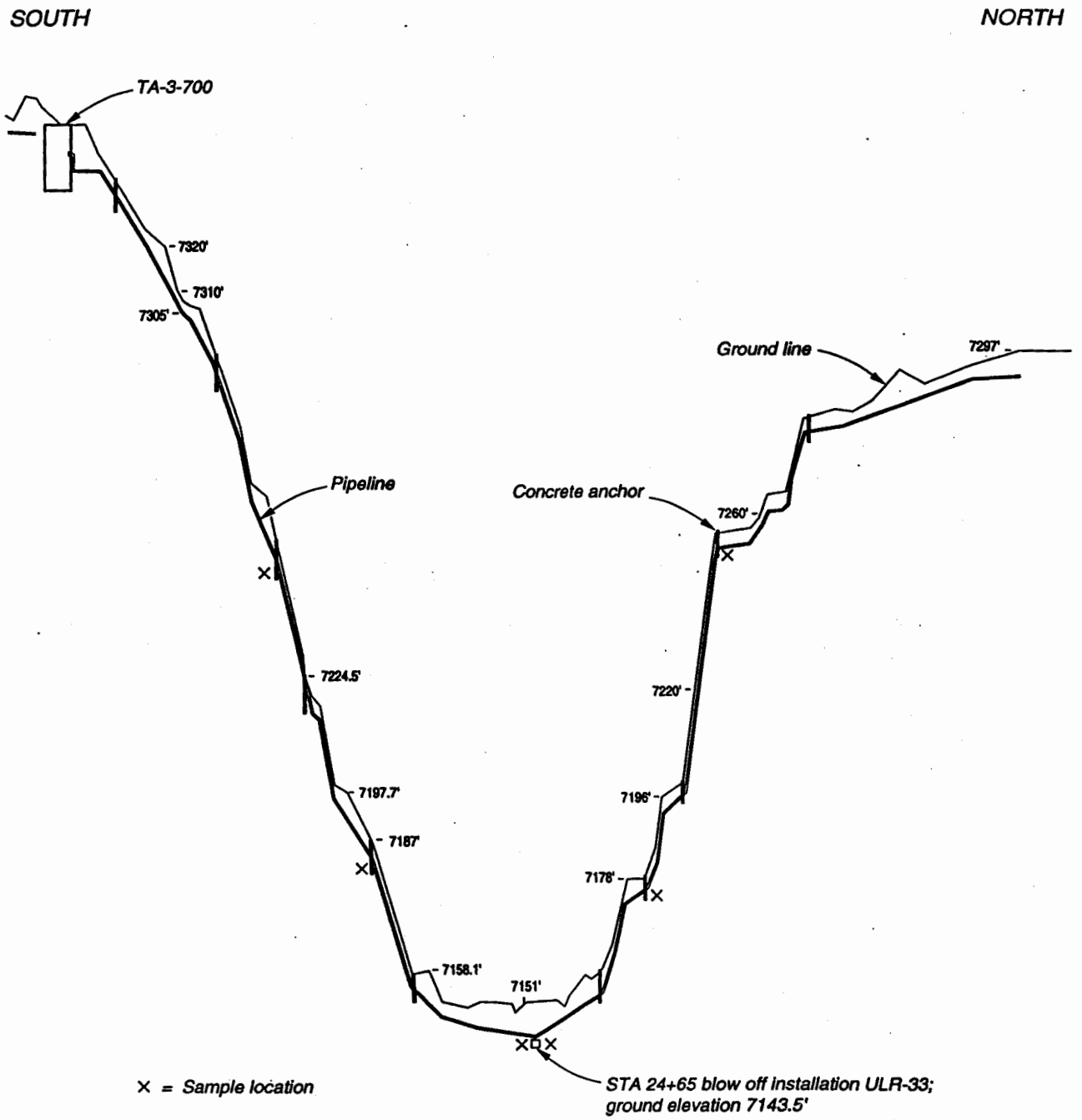

Figure 3.2.3.2-1 Cross section view of pipeline in Los Alamos Canyon showing proposed sampling locations for a portion of PRS 0-017.