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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


7022

ENCLOSURE

SAP for SWMU 0-017
dated 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.**