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Los Alamos National Laboratory

Environmental Restoration Project

EXPEDITED CLEANUP PLAN

for

SOLID WASTE MANAGEMENT UNIT 18-003(e)

June 1995
Revision 0

Environmental
Restoration

1475

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ACRONYMS

AOC	area of concern
AP	Administrative Procedure
CEARP	Comprehensive Environmental Assessment Response Program
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CST	Chemical Science and Technology (Division)
CST-3	Analytical Services (Group)
DOE	U.S. Department of Energy
EC	expedited cleanup
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
FPL	Field Project Leader
FTL	Field Team Leader
HSWA	Hazardous and Solid Waste Amendments
LANL, the Laboratory	Los Alamos National Laboratory
PCOC	potential contaminant of concern
PPE	personal protective equipment
PRS	potential release site
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAL	screening action level
SOP	Standard Operating Procedure
SSHASP	Site-Specific Health and Safety Plan
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	Technical Area
TCLP	Toxicity Characteristic Leaching Procedure
VOC	volatile organic compound

1.0 INTRODUCTION

This Expedited Cleanup (EC) Plan is for Solid Waste Management Unit (SWMU) 18-003(e) at TA-18, Los Alamos National Laboratory (the Laboratory), Los Alamos, New Mexico (Figure 1-1). This EC Plan is being proposed as part of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) described in the RFI Work Plan for Operable Unit 1093 (LANL 1993, 1085).

SWMU 18-003(e) is included in Table A of the original Hazardous Solid Waste Amendments (HSWA) module of the Laboratory's RCRA permit.

SWMU 18-003(e) consists of a deactivated septic tank that was filled with sand. Results from the RFI indicate the contents of the septic tank are hazardous waste and straightforward to remediate. The drainfield associated with SWMU 18-003(e) does not pose a potential risk to human health or the environment.

EC activities proposed by the plan include removing the tank contents, cleaning its interior, stabilizing the tank by filling it with concrete, and leaving it in place.

This EC Plan identifies the level of effort required from initial transmittal of the plan to the U.S. Environmental Protection Agency (EPA) for review, through implementation, to the completion of the final project report. In the development of this EC Plan, the following assumptions are made:

- Land use at the location of this SWMU will be for industrial purposes.
- Minimal delays in EC operations will result from inclement weather and site access delays. Delays that could result from the acquisition and scheduling of heavy equipment and from accepting waste at permitted disposal facilities cannot be anticipated and therefore are not considered within this plan.
- The site-specific health and safety plan (SSHASP) will be developed specifically to address chemicals of concern (COC) identified in this EC Plan. Deviations from these anticipated COC concentrations concern may necessitate adjustments to that plan.
- Any comments generated by agencies for public review may necessitate adjustments to the scope of this EC Plan.

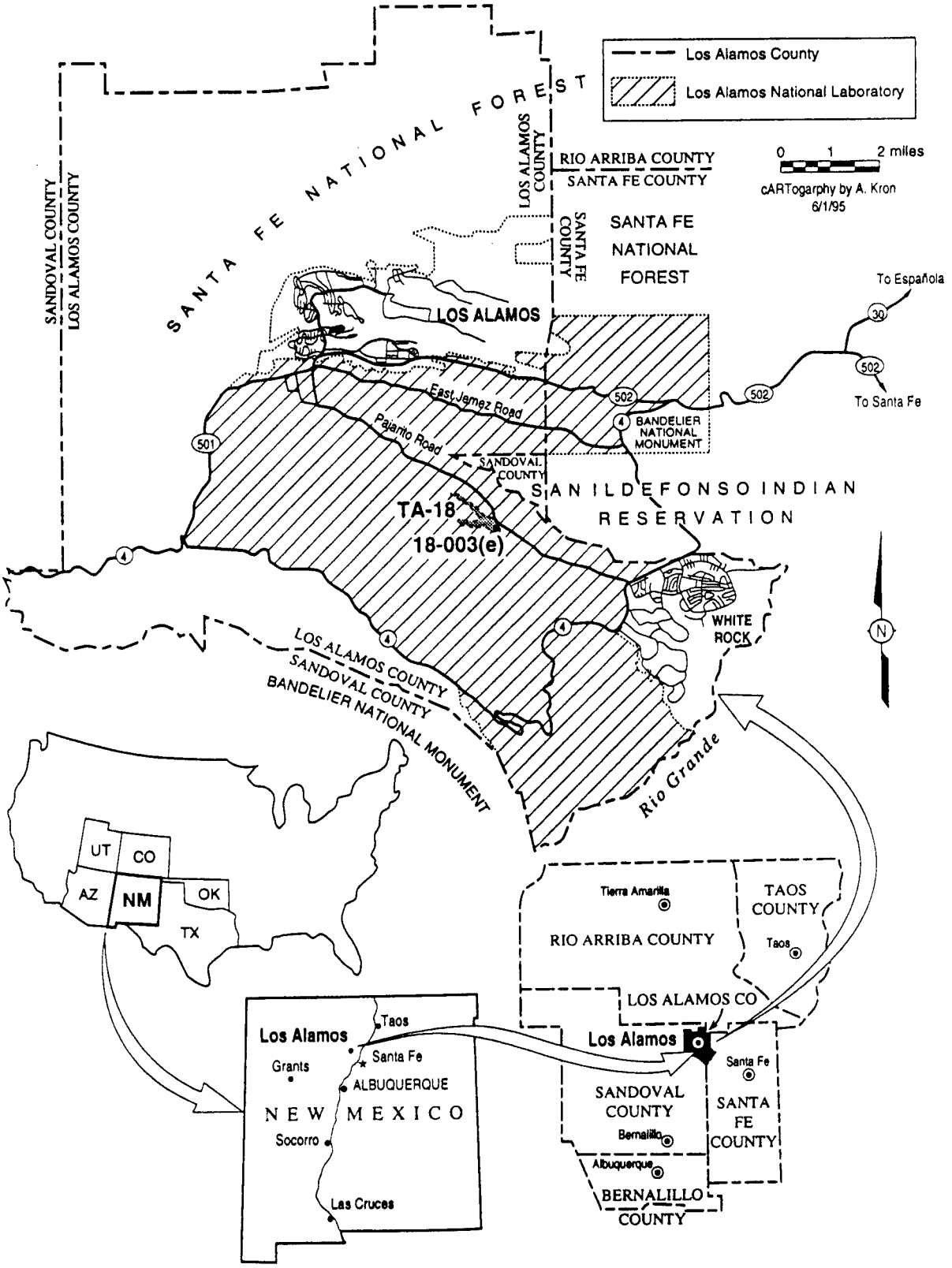


Figure 1-1. Regional location map.

2.0 SITE BACKGROUND AND ENVIRONMENTAL SETTING

2.1 Description of Septic Tank 18-40, SWMU 18-003(e)

SWMU 18-003(e) is a 500-gal. cylindrical concrete septic tank 6 ft in diameter and 6 ft, 2 in. high. Two inlet lines are located at right angles along the northern end of the tank, while a single outlet is situated along the southeastern section of the unit. A 2-ft diameter cast-iron manhole lid allows access to the tank. It is filled with sand to the upper concrete cover, preventing personnel entry. Vertical reinforced-concrete baffles, 6 in. high, are located in front of the inlet and outlet pipes, forming three sides of a square.

2.1.1 Operational History

SWMU 18-003(e), in service from 1951 until 1969, served Buildings TA-18-28, TA-18-31, TA-18-37, TA-18-129, and perhaps Septic Tanks TA-18-43 and TA-18-152. The SWMU primarily received sanitary waste, although it also received water from a sink in a small machine shop added to TA-18-28 in 1964.

2.1.2 Physical Setting

The tank is located south of TA-18-37 within the TA-18 outer security fence in the grassy area north of Kiva 3 (Figure 2-1). SWMU 18-003(e) lies entirely on U. S. Department of Energy (DOE)-owned land in Pajarito Canyon.

The prevalent soil type in the canyon bottom is the well-drained, alluvial-derived Totavi series. Alluvial channel-fill deposits are approximately 35 ft thick in the eastern portion of TA-18, where the SWMU is located. Pleistocene ash flows of the Bandelier Tuff directly underlie the soil and alluvial deposits.

Stream flow in the eastern section of Pajarito Canyon is ephemeral. A significant volume of surface flow in the form of stream and surface-water runoff recharges an unconfined, perched groundwater body in the channel-fill alluvium. The shallow groundwater is confined to the canyon alluvium extending from the top of the Bandelier Tuff to near ground surface. Thickness of the saturated zone varies seasonally, as does the depth to groundwater, which ranges from approximately 8 to 15 ft. The perched aquifer is believed to not be hydraulically connected with the regional groundwater system. The main aquifer is located approximately 300 ft below the perched alluvial groundwater.

2.2 Summary of Investigations

This septic tank and its drainfield were sampled in 1994 as part of the RFI Phase I characterization at TA-18.

2.2.1 Investigations Prior to RFI

No information is available regarding any sampling investigations in Septic Tank TA-18-40 being done prior to the RFI. However, the location and possible contaminants of the septic tank were noted in both the 1987 Comprehensive Environmental Assessment and Response Program (CEARP) report (DOE 1987, 0264) and the 1990 Solid Waste Management Units Report (LANL 1990, 0145).

2.2.2 RCRA Facility Investigation

During July 1994, multimedia samples were collected from the septic tank and associated drainfield to determine the potential effect of the inactive septic system on public health and the environment.

Septic Tank. Two samples of the tank's sand fill were obtained and analyzed for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), RCRA metals, isotopic plutonium and total uranium. Two boreholes were installed adjacent to the tank walls and sampled to determine the integrity of the structure.

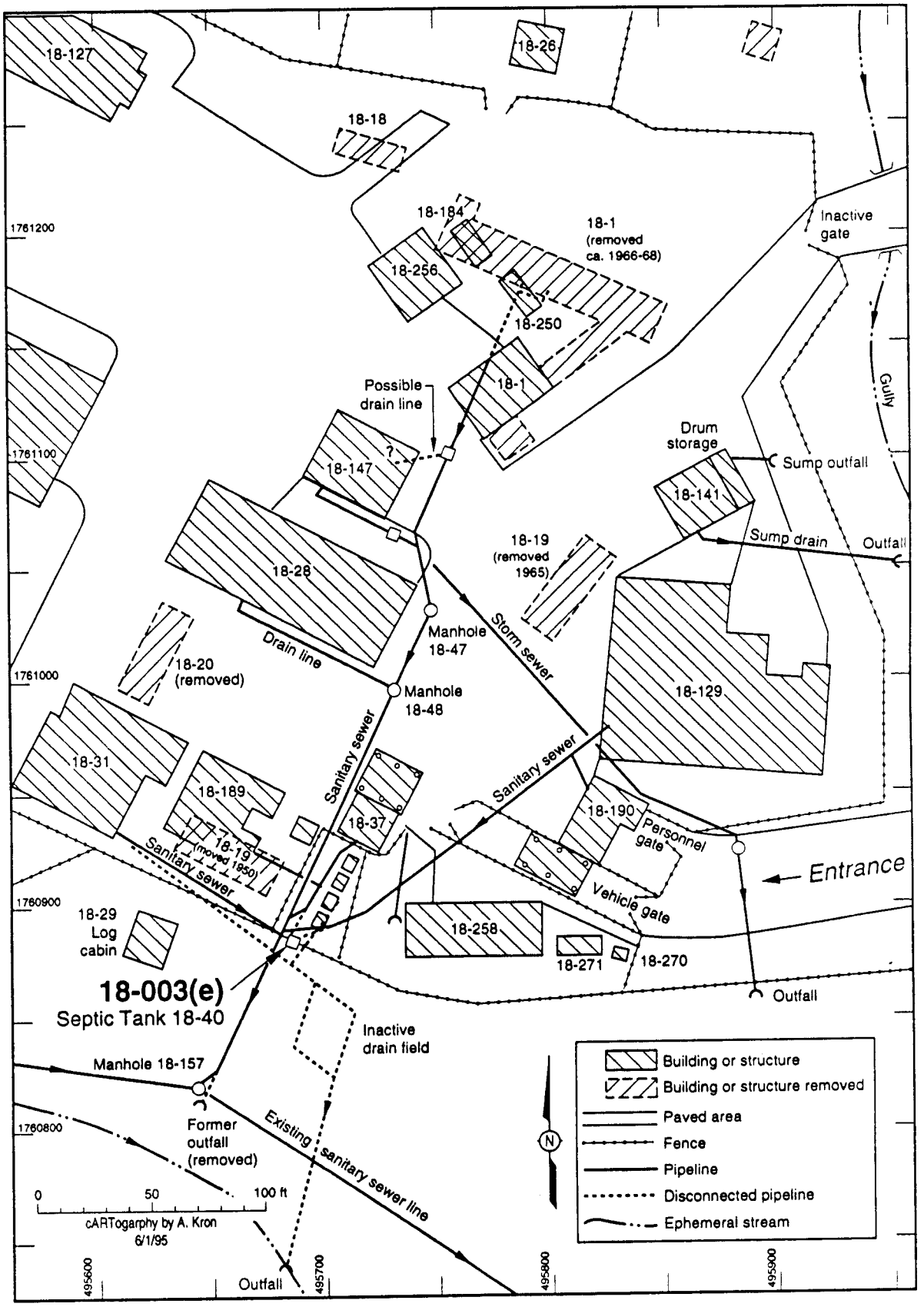


Figure 2-1. SWMU 18-003(e) location map.

Drainfield. Approximately 24 soil samples were collected in the drainfield and next to the septic tank and analyzed for VOCs, SVOCs, metals, isotopic plutonium and total uranium. Subsurface soil samples were collected at discrete intervals from several boreholes drilled throughout the leachfield.

Two boreholes encountered shallow groundwater. Shallow groundwater samples were collected from these locations. These water samples were also analyzed for chlorides and nitrates so that, based on comparisons with background soil and groundwater concentrations, the proximity of the sample locations to drainfield leach zones could be ascertained.

2.2.3 Evaluation of the Results

Appendix A presents a summary of the analytical data for samples collected from septic tank and drainfield. An evaluation of the results provided the following findings:

Septic Tank

- No radionuclides were detected at concentrations above background.
- Levels of detected metals were significantly below SALs.
- No identifiable compounds were detected in the SVOC analysis.
- The VOC analysis revealed slightly elevated concentrations. The maximum reported constituent concentrations (in mg/kg) were acetone (270); 2-butanone (24); 1,2 dichloroethane (1,2 DCA) (7); cis-1,2-dichloroethylene (cis 1,2 DCE) (660); and trichloroethene (TCE) (200). Concentrations were reported in liquid units (µg/l) because of the watery nature of the sand fill. However, for evaluation of risk, the material should be appropriately treated as a solid material. The measured concentrations are all below screening action levels (SAL) for soil.

Drainfield

- Total uranium and isotopic plutonium levels are below SALs and below or in the range of background.
- Levels of metals were significantly below SALs.
- SVOC analytes were below detection limits. The one exception, diethylphthalate (6.3 mg/kg), is several orders of magnitude below the corresponding SAL.
- VOC analytes in all soil and groundwater samples were below detection limit. The only exceptions were low levels of acetone (a probable laboratory contaminant) and TCE (20 µg/kg). These values are below SALs.

2.2.4 Conclusions

Based on analytical results, the contents of the septic tank are considered hazardous waste because of the presence of the following slightly elevated VOC constituents: 1,2 DCA; cis 1,2 DCE; and 1,1,1-trichloroethane (TCA). Concentrations of COCs remaining in the tank are all below SALs.

Analytical results from the associated drainfield reveals COCs significantly below SALs or below laboratory detection limits. TCE was detected at a low concentration at one sample location; however, the reported value is estimated because of laboratory uncertainty. The comparison of background nitrate levels with those observed at sample locations confirm samples were collected within soils affected by sanitary waste disposal.

2.3 Types and Volumes of Waste

The types and volume of the wastes expected to be generated by the proposed cleanup are presented in Table 2-1. Waste handling/disposal options for mixed waste versus hazardous waste are significantly

different. Therefore, EC field activities will not be implemented until analytical results for radioactive constituents have been received and reviewed.

TABLE 2-1
ANTICIPATED WASTE VOLUMES

Item	Type	Volume
Sand waste from tank	hazardous	5.5 yd^3
Decontaminated water	aqueous - potential hazardous	4 drums
PPE/Sampling Waste	solid - potential hazardous / noncontaminated	1gal.

This EC Plan proposes that the drainfield area be decommissioned in place. The tank contents contain slightly elevated levels of TCE, which is classified as a RCRA F-listed hazardous waste (40 CFR 261, Subpart D). In addition to the existing material in the tank, potentially contaminated water will be generated when the tank interior is washed following the removal of its existing contents. This EC Plan proposes consolidation of this wastewater with the removed tank residuals. As described in Section 3.3, the contents of the tank and the washwater will be pumped into containers, which will be handled by an approved off-site waste disposal facility. Treatment or stabilization of the residuals before its disposal may be necessary. The specific nature of this stabilization will be determined by the disposal facility.

Additional waste generated by this activity will be limited to decontamination water, disposable sampling equipment, and personal protective equipment (PPE). These materials will be handled in accordance with the waste management checklist (Annex 6.6) and treated as potentially mixed waste pending field screening and/or analytical results.

2.4 Potential Impacts on Public Health and the Environment

Potential exposure routes of receptors (animal and human) include

- inhalation (especially when the facility is disturbed);
- ingestion (in particular, receptors living onsite could be exposed by eating plants growing in soil contaminated by tank contents); or
- skin contact with contaminated soils or sediments.

Direct human contact with the soil surrounding the septic tank or in the drainfield would occur only through significant disturbance of the soil (Figure 2-2).

2.4.1 Potential Pathways

2.4.1.1 SWMU - In Place

Sources from which potential contaminants may migrate are the septic tank, associated piping and drainfield, and contaminated soils and gravels. Contaminants may reside in soils and sediments underlying and adjacent to the septic system components, in the air, and/or in plants. Transport mechanisms include surface water, subsurface water, wind, and plant uptake. Subsurface transport of potential contaminants is more critical where underground systems, such as septic systems, are in place.

2.4.1.2 SWMU - Remediation

EC activities will remove the tank's overburden and clean the septic tank interior. This could present additional temporary potential pathways for contaminant migration as a result of the increased surface exposure of contaminated materials. The primary pathways associated with these activities are wind dispersion and surface-water runoff.

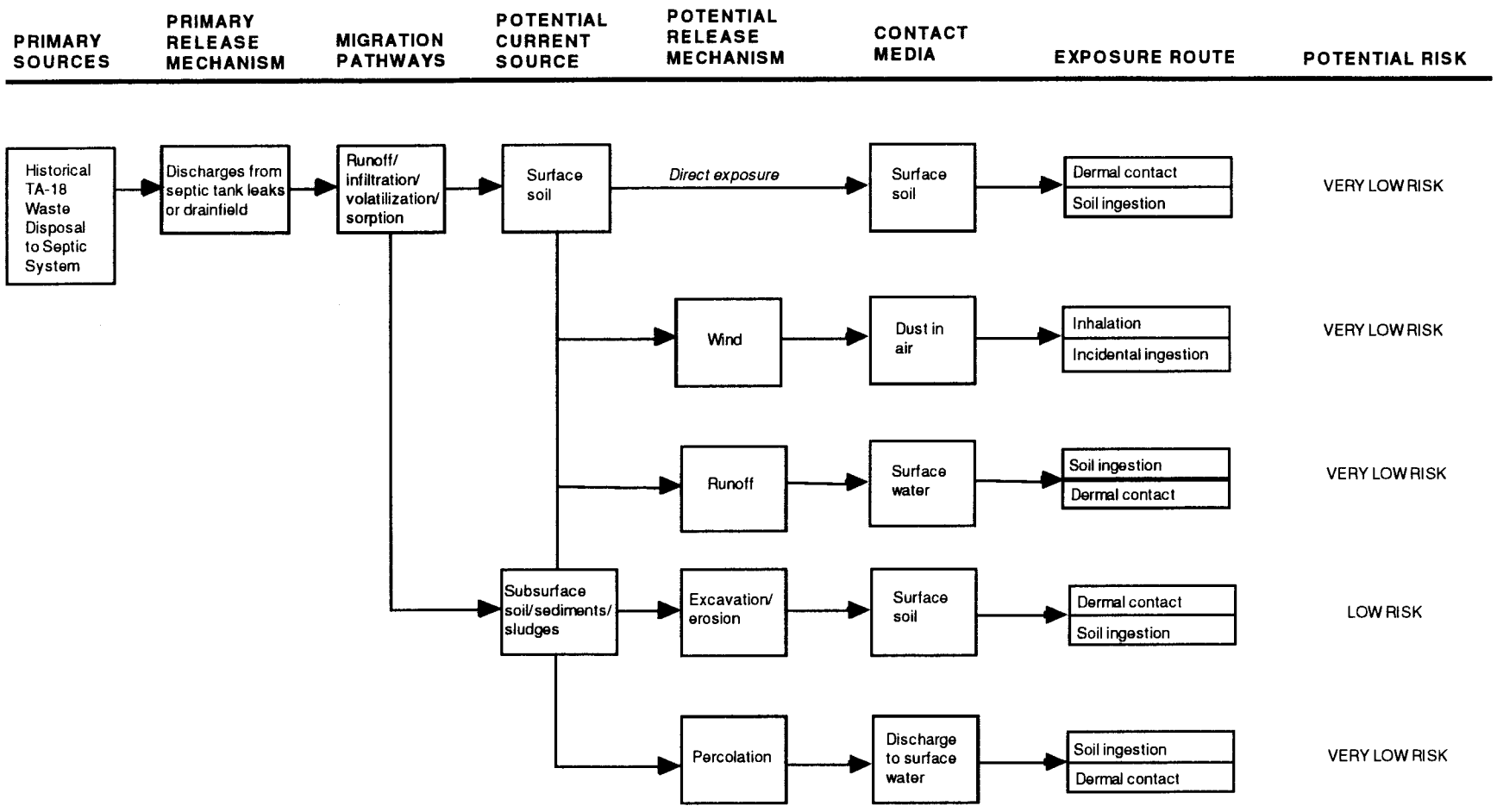


Figure 2-2. Conceptual exposure model for SWMU 18-003(e)

To minimize potential particulate dispersion, disturbed areas will be monitored both visually and mechanically for dust. Dust suppression techniques, such as the application of water or plastic sheeting over disturbed surfaces, may be implemented. Similarly, disturbed areas will be monitored for potential contaminant migration via surface-water runoff. Plastic sheeting, berms, or other temporary structural barriers may be implemented as necessary to minimize this risk.

Reported analytical results indicate the levels of VOCs present at the inactive septic system will be low enough that any potential contaminant migration by volatilization will not pose an unacceptable human or environmental risk. Soil and sand fill will be monitored using field instruments so that measures can be taken to protect human health and the environment if unanticipated levels of contaminant vapors are encountered.

During field activities, decontamination water, disposable PPE, and sampling equipment will be monitored for organic vapors and radioactive constituents. These materials will be placed in containers and disposed of according to an approved task-specific waste management checklist.

2.4.2 Future Land Use

This former septic system lies entirely on DOE-owned land; the residential community of White Rock lies to the east of TA-18. In the foreseeable future, land in the area of this SWMU is anticipated to be used exclusively for Laboratory operations or other industrial purposes (LANL 1994, 1171).

2.4.3 Cleanup Levels

SALs are risk-based, media-specific action levels with which the maximum concentrations of an analyte are compared to determine whether further evaluation of potential contamination is warranted (LANL 1993, 1085). SALs are based on regulatory levels (e.g., maximum contaminant levels) or are calculated using a risk-based methodology described in the proposed RCRA Subpart S, Corrective Action for Solid Waste Management Units (EPA 1990, 0432). An additional conservative modification of the Subpart S methodology was introduced to account for exposure to VOCs volatizing from water or soil. Calculation of the soil/water-to-air volatilization factor was based on an EPA equation and on chemical-specific parameters (LANL 1993, 1085).

SALs are calculated using the most current chemical, route-specific toxicity values and default exposure parameters. They are based on average daily exposures that will not result in exceeded target risks or hazard values (i.e., a cancer risk of 1 in a million for all Class A and B carcinogens, a cancer risk of 1 in 100,000 for all Class C carcinogens, and a hazard index of 1 for noncarcinogens).

The additive effects of multiple constituents is similarly evaluated by adding the ratios of the SAL comparison values (maximum concentrations/SAL) for each constituent with a similar toxic end point (e.g., cancer, kidney effects, liver effects). If the total value is less than 1, the additive effects of multiple constituents are not considered to present a human health risk. If multiple constituents are detected and the total sum of the SAL comparison ratios (maximum concentrations/SAL) is less than 1 (LANL 1993, 1017), then the cleanup standard will be met.

As indicated previously, measured concentrations of COCs in the drainfield and in soil next to the tank are below SALs; therefore, no cleanup of those soils is proposed. The tank contents, which are considered to be hazardous waste, will be removed for proper disposal. Low quantities of residual waste could remain in the tank following pressure rinsing. However, because COC concentrations are below SALs, this residual material does not pose an unacceptable risk.

3.0 EXPEDITED CLEANUP

3.1 Overview and Rationale

Analytical data, as discussed in Section 2.2, indicate that the septic tank contains hazardous waste. Sample results from boreholes adjacent to the septic tank walls indicate the tank is intact; no contaminants in these samples were detected at or above background levels. However, fractures in the tank or joint failures between the tank and inflow or outflow lines could develop, resulting in contamination to the surrounding soil material. Therefore, residual waste will be removed from the tank. The inside of the tank will be decontaminated. The waste removed from the tank and all decontamination fluids will be sampled and managed appropriately.

Analytical data for samples collected from drainfield soils and from underlying shallow groundwater indicate significant releases have not occurred. Therefore, the drainfield will be decommissioned in place without removal of any soil.

3.2 Permitting, Approval, and Notification Requirements

The Laboratory will be prepare and submit an excavation permit for execution of this plan.

Documentation will be prepared in accordance with Laboratory ER Administrative Procedure LANL-ER-AP-05.1, Readiness Review for Environmental Restoration Program Field Activities. Key documents to be prepared for this review include a SSHASP and a waste management checklist. The SSHASP will specify training requirements; all site workers must complete training prior to the implementation of this EC Plan.

3.2.1 Regulatory Notification/Permit Modifications

SWMU 18-003(e) is included in Table A of the Hazardous and Solid Waste Amendments module of the Laboratory's RCRA permit. Implementation of this EC will require a Class III modification to the Laboratory's RCRA permit. EPA and the New Mexico Environment Department have been notified of this project, and a request for a permit modification has been submitted. Implementation of this EC Plan will proceed upon receipt of EPA approval.

3.2.2 DOE Approval

If the Laboratory intends to implement this EC prior to receiving EPA approval, DOE approval must be documented through receipt of the signed Field Work Approval Form (Annex 6.7).

3.3 Cleanup Activities

SWMU 18-003(e) is located within a secured area at TA-18; therefore, site preparation will be limited to scheduling for site access and establishing work zones. Initially, the overburden from the tank will be removed to expose the tank's central portal. The tank contents will be vacuum pumped from the central portal, if possible; otherwise, the activities will proceed to the removal of the tank's concrete lid and subsequent content removal. The contents have been adequately characterized during the RFI effort; however, pending requirements by the permitted disposal facility, a sample of the tank's contents will be collected and analyzed to establish the current waste characterization profile.

Once the tank's contents have been removed and contained, the tank interior will be washed using a pressure wash. The wash liquid will then be pumped from the tank and placed in containers. Air exhausted from the vacuum unit will be filtered in a manner consistent with health and safety requirements. The consolidated solid waste and the wash liquid will be disposed of in accordance with the waste management checklist. The septic tank will then be filled with concrete. After allowing the concrete to dry, the lid of the tank will be replaced and overburden reapplied to its original location.

3.4 Waste Management Issues

As indicated in Section 2.3, wastes in the septic tank should be classified as hazardous wastes. Waste generated during this EC Plan will be handled in accordance with the waste management checklist.

3.4.1 Characterization of Materials for Disposal

Field screening of samples for radioactivity and organic vapors will be used to identify gross contamination. Previous analyses of the tank contents will be used to characterize the contents and associated wastewater, except as noted below. Characterization of PPE and other sampling wastes will be based on environmental sample analyses.

3.4.2 Treatment, Storage, and Disposal Plans

Wastes generated during the EC will generally be limited to liquids and sand (i.e., decontamination water, residual sand within the tank, and liquid waste from the tank cleaning). Because these wastes are from a single source area, the materials will be consolidated into one wastestream. Characterization of the wastestream prior to its consolidation may be necessary to ensure timely and economical disposal. Therefore, as concentrations of COCs are likely highest in the sand, a sample of these residuals will be obtained during the initial field activities. This sample will be analyzed for COCs as requested by the permitted transportation and disposal facilities.

Based on 1994 sample results, the projected classification of the consolidated wastestream will be as listed hazardous waste. Contractors, such as vacuum truck operators, and permitted disposal facilities can be readily obtained to handle listed waste. Transportation of the wastes to the permitted disposal facility by the selected subcontractor will be handled under appropriate manifests. Once at the disposal facility, the liquid waste may require treatment, such as stabilization.

3.5 Verification Plan

RFI sample results indicate the tank contents are hazardous waste. Samples collected from the periphery of the tank indicate the tank structure is intact and the surrounding soils pose no significant risk to human health or the environment. Analytical results from the drainfield reveal collection locations were within the septic leachfield and were significantly below SALs and/or background levels for all analytes. Therefore, as the contamination is limited to the tank's contents (which will be removed), no verification sampling is proposed.

3.6 Site Restoration Plan

Every attempt will be made to return the area to its preinvestigation condition. Excavated overburden will be compacted and the ground surface returned to its original condition.

3.7 Acceptance Inspection

The Laboratory proposes an Acceptance Inspection as the mechanism for DOE and EPA to assess that the Laboratory has implemented this EC Plan effectively. A minimum of 10 days' notification will be provided to the agencies before the start of field activities. At this time, a tentative date for the inspection will be agreed upon.

Field activities associated with this EC are not anticipated to generate waste other than construction debris and incidental administrative debris. If potentially contaminated waste is generated, it will be stored in a designated storage area pending laboratory analysis and/or field screening results and appropriately treated, stored, or disposed of.

An Acceptance Inspection Checklist will be used to document the scope of the inspection and will become part of the EC Final Report. The checklist and the timing of the inspection will be developed by the Laboratory and agreed to by the other agencies. This inspection checklist will contain specific items, criteria, and requirements to be inspected that will constitute acceptance of remediation activities.

The Acceptance Inspection will be conducted by an independent professional skilled in the appropriate technical discipline. During the Acceptance Inspection, written resolution and an anticipated schedule for completion will be identified for any outstanding items and documented on the inspection checklist. The Laboratory Field Project Leader (FPL) or designee will be responsible for completing outstanding inspection items and documenting their resolution in the EC Final Report.

Upon completion of remediation activities, the Laboratory will submit a written certification to EPA Region 6, stating that the remedy has been completed in accordance with the EC Plan and Acceptance Inspection Checklist. The certification will be signed by the Laboratory and by the independent professional conducting the inspection. The certification will accompany the EC Final Report.

3.8 Final Report

Following the completion of all field activities, a final report will be prepared. A proposed outline for this report is presented as Annex 6.8.

4.0 PROJECT MANAGEMENT

Overall implementation of this expedited cleanup will be managed by Gene Gould, the FPL, supported by the ICF Kaiser Field Team Leader (FTL), a Field Technician, and a Site Safety Officer (SSO).

4.1 Staffing and Resource Requirements

Total anticipated costs for the EC is $56,560, as detailed below:

Prefield Activities

Preparation of Waste Management Plan		$1,500
Preparation of Site Health and Safety Plan		5,600
Site Preparation/Subcontractor Scheduling/Preparation of Field Plan		8,400
Subtotal		$15,500

Field Activities

Removal of tank's contents and pressure work		5,800
Disposal of tanks residuals and wastewater		
Filling of tank with concrete		3,000
Site restoration/reseeding		1,000
Equipment to be rented includes:		
Backhoe		500
Subtotal		$10,300

Personnel Costs

ICF Kaiser FTL	$70/hr x 5 days	5,600
Site Health and Safety Officer	$70/hr x 5 days	5,600
LANL Field Supervisor	$70/hr x 5 days	5,600
Backhoe Operator	$60/hr x 2 days	960
		$17,760

Analytical Costs

Equipment Rinsate/Waste Disposal Characterization (3 samples)		12,000
Subtotal		$12,000

Post-Field Activities

Acceptance Inspection		500
Final report		500
Subtotal		$1,000
Total Estimated Cost		**$56,560**

4.2 Schedule

The proposed EC schedule is shown in Table 4-1. The submittal of this EC Plan to EPA in June 1995 will initiate the 60-day public review/comment period. No sooner than 15 days after the start of this period, a public meeting will be held. Pre-field work activities and development of implementation plans will be conducted concurrent to the public review period. Should this proposed EC Plan be approved by the agencies and the public, implementation of the remaining EC activities will be initiated in August. Completion of field work and the Acceptance Inspection should be completed in July, and the final EC Report will be submitted by December, 1995.

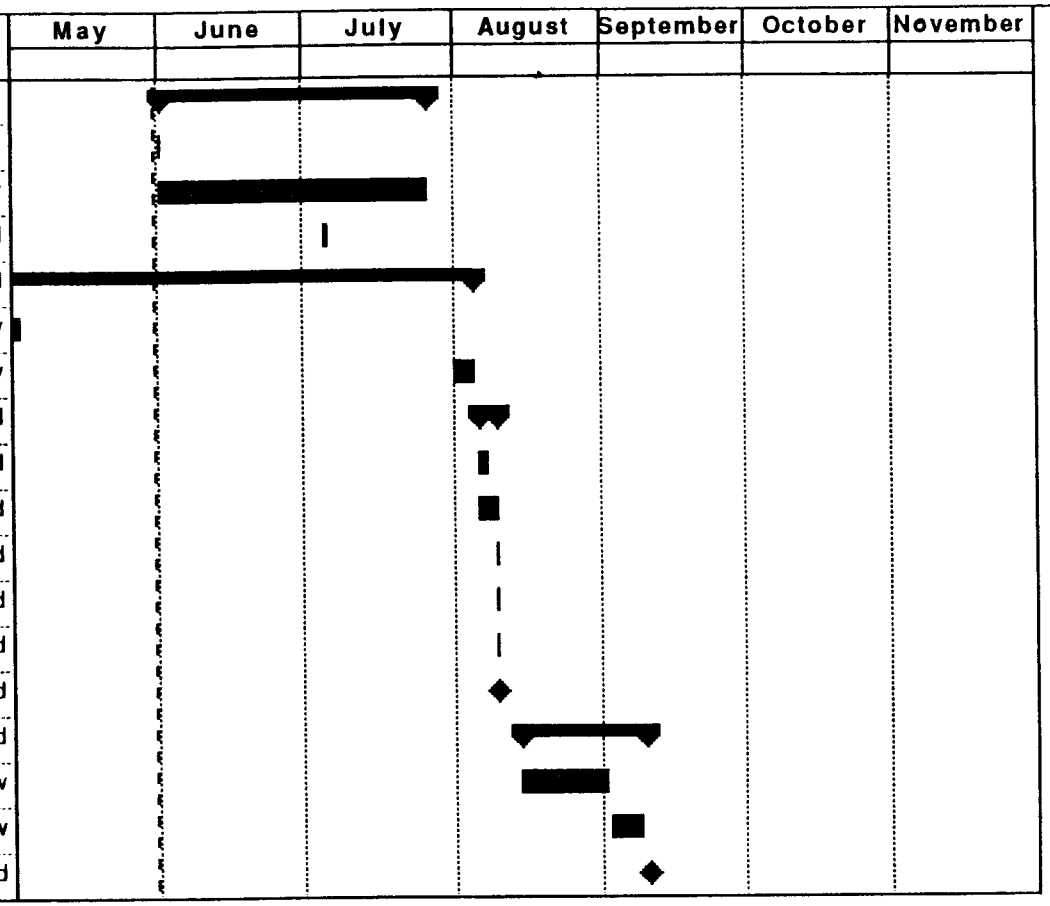
4.3 Stakeholder Notifications

Stakeholder notifications are an integral part of the procedure for conducting ECs. The ER Project office will notify state and local governments, external and internal stakeholders, and individuals on the ER Project mailing list of the availability of the EC Plan. The EC plan will be available to the stakeholders at the LANL Community Reading Room in Los Alamos; at the document repositories at the Los Alamos, Española, and Santa Fe public libraries; and at the San Ildefonso Pueblo Office of the Governor.

The submission of this EC Plan to EPA will trigger publication of a public notice indicating the start of the 60-day public comment period.

TABLE 4-1 PROPOSED SCHEDULE FOR SWMU 18-003(e)

ID	Name	Duration
1	1 PUBLIC ACCEPTANCE	55.38ed
2	1.1 SUBMIT EC PLAN TO EPA	1d
3	1.2 PUBLIC COMMENTS	8w
4	1.3 PUBLIC MEETINGS	1d
5	2 PLANNING	106.38ed
6	2.1 PREPARE HEALTH/SAFETY PLAN	2w
7	2.2 FIELD WORK PLANNING	1w
8	3 IMPLEMENT EXPEDITED CLEANUP	4.38ed
9	3.1 MOBILIZATION	1d
10	3.2 PERFORM CLEAN UP	3d
11	3.3 SITE RESTORATION	1d
12	3.4 INSPECTION & SUPERVISION	1d
13	3.5 DEMOBILIZATION	1d
14	3.6 COMPLETE EC	0d
15	4 ANALYSIS AND REPORT PREPARTION	26.38ed
16	4.1 SAMPLE ANALYSIS	3w
17	4.2 PREPARE FINAL REPORT	1w
18	4.3 SUBMIT REPORT	0d



Project: SWMU 36-003(a) schedul
Date: 5/31/95

Critical — Noncritical — Progress — Milestone — Summary

ICF KAISER ENGINEERS, INC.

5.0 REFERENCES

DOE (U.S. Department of Energy), 0264, October 1987. "Phase I: Installation Assessment, Los Alamos National Laboratory," Volumes 1 and 2, (draft), Comprehensive Environmental Assessment and Response Program, Albuquerque Operations Office, Albuquerque, New Mexico. (DOE 1987, 0264) (Title for Volume 2 not included).

EPA (US Environmental Protection Agency), July 27, 1990. "Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities," proposed rule, Title 40 Parts 264, 265, 270, and 271, Federal Register, Vol. 55., pp. 30798-30884 (EPA 1990, 0432).

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LANL (Los Alamos National Laboratory) February 1995. "Installation on Work Plan for Environmental Restoration," Revision 4, Los Alamos National Laboratory Report LA-UR-95-740, Los Alamos, New Mexico. (LANL 1995, 1164).

6.0 ANNEXES

6.1 Implementation SOPs

See Environmental Restoration Standard Operating Procedures, Volumes I and II, November 17, 1993, Los Alamos National Laboratory.

6.2 Quality Assurance Plan

See Quality Program Plan And Quality Assurance Project Plan For Environmental Restoration, last revision January 1993, Los Alamos National Laboratory, Los Alamos, New Mexico.

6.3 Health and Safety Plan

See Los Alamos National Laboratory (LANL) Environmental Restoration (ER) Project Health and Safety Plan (HASP) (LANL, February 11, 1995).

6.4 Records Management Plan

See Installation Work Plan for Environmental Restoration, Revision 4, Chapter IV, Records Management Program Plan.

6.5 Public Involvement Plan

See Installation Work Plan for Environmental Restoration, Revision 4, Chapter V, Public Involvement Program Plan.

6.6 Field Work Approval Form

6.7 Proposed Outline for Expedited Cleanup Final Report

6.8 RFI Analytical Reports

ANNEX 6.6
FIELD WORK APPROVAL FORM

This form must be completed prior to starting site remediation field work in Expedited Cleanups that do not have an EPA-approved work plan.

I, _____, DOE-LAAO, **APPROVE** the field work as proposed in the accompanying Expedited Cleanup Plan (TA-18) for the decommissioning of SWMU 18-003(e) the inactive sewer line and drainfield.

I, _____, DOE-AL, **DO NOT APPROVE** the field work as proposed for SWMU 18-003(e) (TA-18) as described in the accompanying Expedited Cleanup Plan for the decommissioning of the inactive sewer line and drainfield.

The following reasons reflect the decision for disapproval:

Signed: _____ Date: _____

ANNEX 6.7
PROPOSED OUTLINE FOR EXPEDITED CLEANUP REPORTS

1.0 Summary of Expedited Cleanup

- 1.1 Overview
- 1.2 Expedited Cleanup

2.0 Site Restoration

3.0 Modifications to the EC Plan

4.0 Quantities and Types of Waste Generated

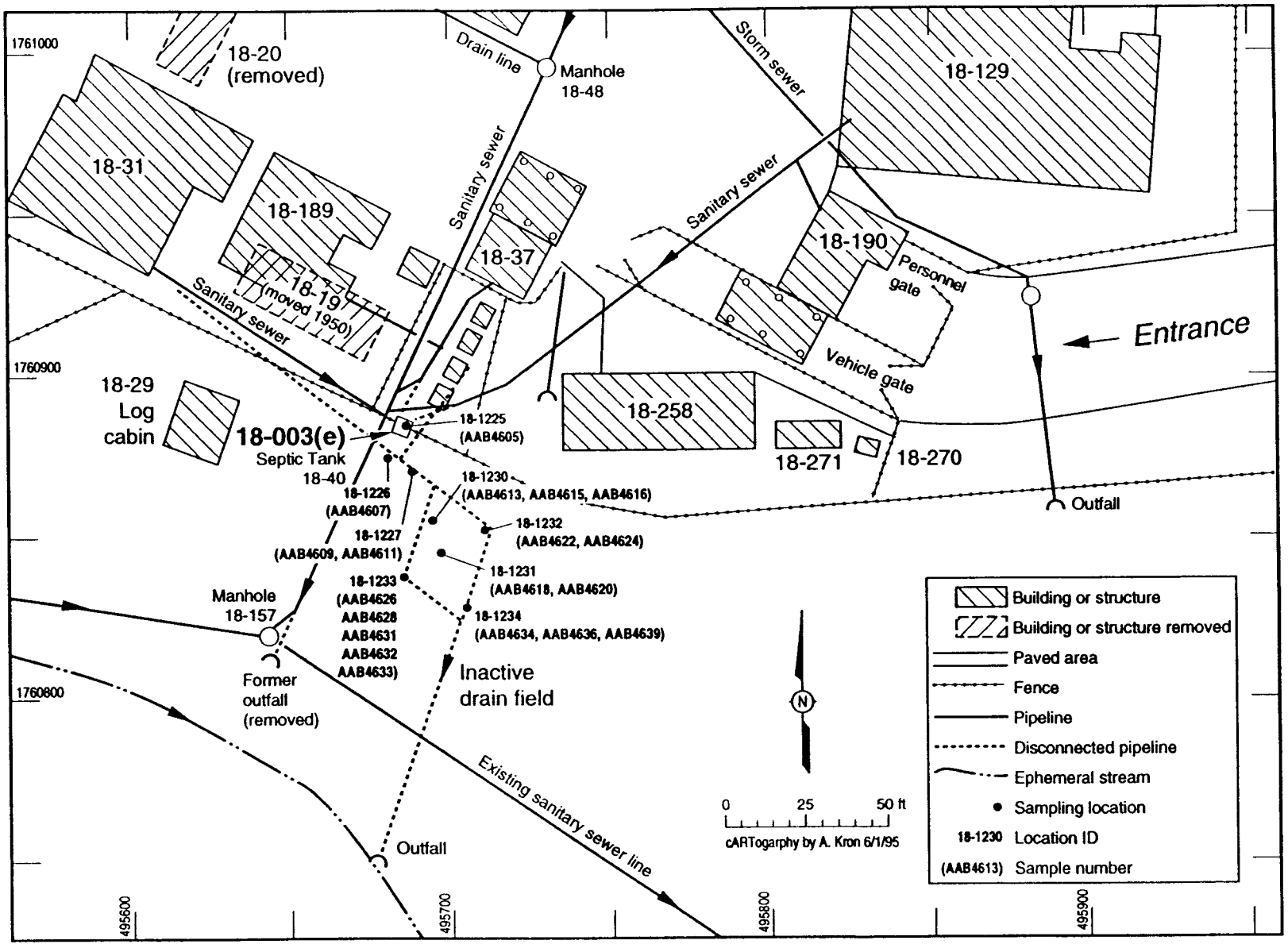
5.0 Outstanding Items from the Acceptance Inspection

6.0 Problems Encountered and Lessons Learned

APPENDIXES

- A Analytical Data
- B Acceptance Inspection Checklist
- C Wastestream Inventory
- D Photographs
- E Certification of Completion

ANNEX 6.8
ANALYTICAL DATA FROM RFI AT SWMU 18-003(e)



Sampling locations for SWMU 18-003(e).

MEASURED CONCENTRATIONS OF COPCs FOR OU 1093

PRS	Sample Number	Location ID	Sample Type	Units	Metals	Nitrates/ Chlorides	Radionuclides	SVOCs	VOCs	SALs	CRQLs	Background
Septic Tank	AAB4605	18-1225	Soil	mg/kg	1140 Aluminum (J)	None Detected		None Detected		~	40	58900
			2-4 ft	mg/kg	72.1 Barium					5600	40	1140
				mg/kg	9140 Calcium					~	1000	54400
				mg/kg	4.2 Chromium					400	10	34.2
				mg/kg	5840 Iron					~	20	35600
				mg/kg	2.1 Lead					400	0.6	39
				mg/kg	622 Magnesium					~	1000	16100
				mg/kg	107 Manganese					11000	3	1030
				mg/kg	13.2 Vanadium					560	10	66
				mg/kg	8.7 Zinc					24000	4	101
				mg/kg					.270 Acetone	8000	0.01	~
				mg/kg					.024 2-Butanone	4000	0.01	~
				mg/kg					.007 1,2-Dichloroethane	0.2	0.01	~
				mg/kg					.660 Cis1,2 -Dichloroethylene	~	0.01	~
				mg/kg					.200 Trichloroethene	1000	0.01	~
				pci/g			0.003 PU-239/240 TPU			18	~	0.052
				pci/g			0.006 PU-238 TPU			20	~	0.014
				ug/g			0.249 U (Total)			160	NA	2.09
Septic Tank	AAB4607	18-1226	Soil	mg/kg	3670 Aluminum(J)			None Detected	None Detected	~	40	58900
			0-5 ft	mg/kg	73.3 Barium					5600	40	1140
				mg/kg	2190 Calcium					~	1000	54400
				mg/kg	4.6 Chromium					400	10	34.2
				mg/kg	8.9 Copper					3000	5	15.7
				mg/kg	7470 Iron					~	20	35600
				mg/kg	23.8 Lead					400	0.6	39
				mg/kg	376 Manganese					11000	3	1030
				mg/kg	1410 Potassium					~	1000	6180
				mg/kg	76.9 Zinc					24000	4	101
				ug/g		15.5 Nitrates						
				ug/g		24.9 Chlorides						
				pci/g			28.14 K-40			~	~	36.1
				ug/g			1.53 U (Total)			160	~	2.09

Boldface values at or above SALs
(J) = Indicates estimated value
NA = Not Applicable, ~ = Not Avail
* =

MEASURED CONCENTRATIONS OF COPCs FOR OU 1093

PRS	Sample Number	Location ID	Sample Type	Units	Metals	Nitrates/ Chlorides	Radionuclides	SVOCs	VOCs	SALs	CRQLs	Background
Septic Tank	AAB4609	18-1227	Soil	mg/kg	9390 Aluminum(J)			None Detected	None Detected	~	40	58900
			5-10 ft	mg/kg	1.3 Arsenic					~	2	11.6
				mg/kg	68.4 Barium					5600	40	1140
				mg/kg	1110 Calcium					~	1000	54400
				mg/kg	9.1 Chromium					400	10	34.2
				mg/kg	5.3 Copper					3000	5	15.7
				mg/kg	11300 Iron					~	20	35600
				mg/kg	5.8 Lead					400	0.6	39
				mg/kg	690 Magnesium					~	1000	16100
				mg/kg	240 Manganese					11000	3	1030
				mg/kg	7.6 Nickel					1600	8	26.7
				mg/kg	669 Potassium					~	1000	6180
				mg/kg	17.3 Vanadium					560	10	66
				mg/kg	5.8 Zinc					24000	4	101
				ug/g		2.65 Chlorides						
				pci/g			0.01 PU-239/240			18	~	0.052
				pci/g			0.006 PU-238 TPU			20	~	0.014
				ug/g			0.598 U (Total)			160	NA	2.09
Septic Tank	AAB4611	18-1227	Soil	mg/kg	4800 Aluminum (J)			None Detected	None Detected	~	40	58900
			0-5 ft	mg/kg	68.0 Barium					5600	40	1140
				mg/kg	1670 Calcium					~	1000	54400
				mg/kg	5.9 Chromium					400	10	34.2
				mg/kg	10.0 Copper					3000	5	15.7
				mg/kg	8180 Iron					~	20	35600
				mg/kg	19.5 Lead					400	0.6	39
				mg/kg	972 Magnesium					~	1000	16100
				mg/kg	299 Manganese					11000	3	1030
				mg/kg	997 Potassium					~	1000	6180
				mg/kg	10.8 Vanadium					560	10	66
				mg/kg	65.9 Zinc					24000	4	101
				ug/g		2.2 Nitrates						
				ug/g		2.84 Chlorides						
				pci/g			0.001 PU-239/240 TPU			18	~	0.052
				pci/g			0.004 PU-238 TPU			20	~	0.014
				ug/g			0.020 U (Total)			160	~	2.09

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MEASURED CONCENTRATIONS OF COPCs FOR OU 1093

PRS	Sample Number	Location ID	Sample Type	Units	Metals	Nitrates/ Chlorides	Radionuclides	SVOCs	VOCs	SALs	CRQLs	Background
Drainfield	AAB4613	18-1230	Soil	mg/kg	2150 Aluminum(J)	None Detected		None Detected	None Detected	~	40	58900
			0-5 ft	mg/kg	1.5 Arsenic					~	2	11.6
				mg/kg	44.7 Barium					5600	40	1140
				mg/kg	851 Calcium					~	1000	54400
				mg/kg	2.5 Chromium					400	10	34.2
				mg/kg	2.9 Copper					3000	5	15.7
				mg/kg	5230 Iron					~	20	35600
				mg/kg	26.7 Lead					400	0.6	39
				mg/kg	275 Mangenese					11000	3	1030
				mg/kg	5.8 Vanadium					560	10	66
				mg/kg	25.1 Zinc					24000	4	101
				pci/g			0.0019 PU-238			20	~	0.014
				pci/g			0.0004 PU-239			18	~	0.052
				ug/g			1.02 U (Total)			160	~	2.09
Drainfield	AAB4615	18-1230	Soil	mg/kg	3240 Aluminum(J)			None Detected	None Detected	~	40	58900
			5-10 ft	mg/kg	1.3 Arsenic					~	2	11.6
				mg/kg	57.6 Barium					5600	40	1140
				mg/kg	790 Calcium					~	1000	54400
				mg/kg	3.7 Chromium					400	10	34.2
				mg/kg	3.0 Copper					3000	5	15.7
				mg/kg	6020 Iron					~	20	35600
				mg/kg	6.9 Lead					400	0.6	39
				mg/kg	231 Manganese					11000	3	1030
				mg/kg	10.4 Vanadium					560	10	66
				mg/kg	21.3 Zinc					24000	4	101
				ug/g		2.72 Chlorides						
				pci/g			0.0019 PU-238			20	~	0.014
				pci/g			0.9771 RA-226			5	~	~
				ug/g			1.18 U (Total)			160	~	2.09
Drainfield	AAB4616	18-1230	Soil	mg/kg	3230 Aluminum (J)			None Detected		~	40	58900
			5-10 ft	mg/kg	41.3 Barium					5600	40	1140
				mg/kg	712 Calcium					~	1000	54000
				mg/kg	3.8 Chromium					400	10	34.2
				mg/kg	3.2 Copper					3000	5	15.7
				mg/kg	6400 Iron					~	20	35600
				mg/kg	3.7 Lead					400	0.6	39
				mg/kg	217 Manganese					11000	3	1030
				mg/kg	8.2 Vanadium					560	10	66
				mg/kg	27.4 Zinc					24000	4	101
				ug/g		2.78 Chlorides						
				pci/g			0.0003 PU-238			20	~	0.014
				pci/g			0.0005 PU-239			18	~	0.052
				ug/g			1.16 U (Total)			160	~	2.09
				mg/kg					.038 Acetone	8000	0.01	~

Boldface values at or above SALs
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* =

MEASURED CONCENTRATIONS OF COPCs FOR OU 1093

PRS	Sample Number	Location ID	Sample Type	Units	Metals	Nitrates/ Chlorides	Radionuclides	SVOCs	VOCs	SALs	CRQLs	Background
Drainfield	AAB4618	18-1231	Soil	mg/kg	3240 Aluminum(J)			None Detected		~	40	58900
			0-5 ft	mg/kg	1.5 Arsenic					~	2	11.6
				mg/kg	63.8 Barium					5600	40	1140
				mg/kg	1360 Calcium					~	1000	54400
				mg/kg	3.8 Chromium					400	10	34.2
				mg/kg	16.7 Copper					3000	5	15.7
				mg/kg	10500 Iron					~	20	35600
				mg/kg	56.2 Lead					400	0.6	39
				mg/kg	586 Magnesium					~	1000	16100
				mg/kg	391 Manganese					11000	3	1030
				mg/kg	4.1 Nickel					1600	8	26.7
				mg/kg	684 Potassium					~	1000	6180
				mg/kg	8.6 Vanadium					560	10	66
				mg/kg	45 Zinc					24000	4	101
				ug/g		6.76 Chlorides						
				pci/g			0.0071 PU-238			20	~	0.014
				pci/g			0.0059 PU-239			18	~	0.052
				ug/g			2.09 U (Total)			160	~	2.09
				mg/kg					0.20 Trichloroethene (J)			
Drainfield	AAB4620	18-1231	Soil	mg/kg	2530 Aluminum(J)			None Detected		~	40	58900
			5-10 ft	mg/kg	1.3 Arsenic					~	2	11.6
				mg/kg	33.0 Barium					5600	40	1140
				mg/kg	762 Calcium					~	1000	54400
				mg/kg	4.0 Chromium					400	10	34.2
				mg/kg	2.6 Copper					3000	5	15.7
				mg/kg	5910 Iron					~	20	35600
				mg/kg	7.9 Lead					400	0.6	39
				mg/kg	206 Manganese					11000	3	1030
				mg/kg	7.3 Vanadium					560	10	66
				mg/kg	23.3 Zinc					24000	4	101
				ug/g		4.28 Chlorides						
				pci/g			0.0018 PU-238			20	~	0.014
				pci/g			0.001 PU-239			18	~	0.052
				ug/g			1.58 U (Total)			160	~	2.09
				mg/kg					.026 Acetone	8000	0.01	~

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MEASURED CONCENTRATIONS OF COPCs FOR OU 1093

PRS	Sample Number	Location ID	Sample Type	Units	Metals	Nitrates/ Chlorides	Radionuclides	SVOCs	VOCs	SALs	CRQLs	Background
Drainfield	AAB4622	18-1232	Soil	mg/kg	1990 Aluminum(J)			None Detected		~	40	58900
			0-5 ft	mg/kg	1.1 Arsenic					~	2	11.6
				mg/kg	59.0 Barium					5600	40	1140
				mg/kg	1170 Calcium					~	1000	54400
				mg/kg	2.2 Chromium					400	10	34.2
				mg/kg	104 Copper					3000	5	15.7
				mg/kg	4760 Iron					~	20	35600
				mg/kg	50.3 Lead					400	0.6	39
				mg/kg	545 Potassium					~	1000	6180
				mg/kg	7 Vanadium					560	10	66
				mg/kg	34.3 Zinc					24000	4	101
				ug/g		3.31 Nitrates						
				ug/g		16.4 Chlorides						
				pci/g			0.0013 PU-238			20	~	0.014
				pci/g			0.0023 PU-239			18	~	0.052
				ug/g			1.82 U (Total)			160	~	2.09
				mg/kg					.029 Acetone	8000	0.01	~
Drainfield	AAB4624	18-1232	Soil	mg/kg	5460 Aluminum(J)					~	40	58900
			5-10 ft	mg/kg	1.9 Arsenic					~	2	11.6
				mg/kg	52.3 Barium					5600	40	1140
				mg/kg	671 Calcium					~	1000	54400
				mg/kg	3.3 Chromium					400	10	34.2
				mg/kg	7770 Iron					~	20	35600
				mg/kg	9.4 Lead					400	0.6	39
				mg/kg	293 Manganese							
				mg/kg	10.6 Vanadium					560	10	66
				mg/kg	32 Zinc					24000	4	101
				ug/g		9.49 Chlorides						
				pci/g			0.0021 PU-238			20	~	0.014
				pci/g			0.0033 PU-239			18	~	0.052
				ug/g			1.18 U (Total)			160	~	2.09
				mg/kg				6.3 Diethylphthalate		64000	0.33	~
				mg/kg					.029 Acetone	8000	0.01	~
Drainfield	AAB4626	18-1233	Soil	pci/g	~	~	0.01 PU-238			20	~	0.014
			0-5 ft	pci/g								
Drainfield	AAB4628	18-1233	Soil	pci/g	~	~		~	None Detected	5600	40	1140
			5-10 ft	pci/g						4	~	1
				pci/g						~	~	~
				pci/g						~	~	~
				pci/g			0.03 PU-238			20	~	0.014
				pci/g			0.01 PU-239			18	~	0.052

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MEASURED CONCENTRATIONS OF COPCs FOR OU 1093

PRS	Sample Number	Location ID	Sample Type	Units	Metals	Nitrates/ Chlorides	Radionuclides	SVOCs	VOCs	SALs	CRQLs	Background
Drainfield	AAB4631	18-1233	Water	ug/L	4830 Aluminum(J)		None Detected	None Detected	None Detected	~	40	58900
				ug/L	18500 Calcium					~	1000	54400
				ug/L	3030 Iron					~	20	35600
				ug/L	6.9 Lead					400	0.6	39
				ug/L	5440 Magnesium					~	1000	16100
				ug/L	538 Manganese					11000	3	1030
				ug/L	6840 Potassium					~	1000	6180
				ug/L	23,600 Sodium					~	1000	1880
				ug/L	111 Zinc					24000	4	101
				ug/L		1280 Nitrates						
				ug/L		20.1 Chlorides						
Drainfield	AAB4632	18-1233	Water	ug/L	13.3 Lead	None Detected		~	~	400	0.6	39
				ug/L	44.2 Zinc					24000	1000	1880
				ug/L			0.0311 PU-238			20	~	0.014
Drainfield	AAB4633	18-1233	Water	ug/L	72.9 Zinc	None Detected		~	~	24000	0.6	39
				ug/L			0.145 PU-238			20	~	0.014
				ug/L			0.0961 PU-239			18	~	0.052
Drainfield	AAB4634	18-1234	Soil	mg/kg	2280 Aluminum(J)			~		~	40	58900
			0-5 ft	mg/kg	1.1 Arsenic					~	2	11.6
				mg/kg	48.4 Barium					5600	40	1140
				mg/kg	1210 Calcium					~	1000	54400
				mg/kg	4.2 Chromium					400	10	34.2
				mg/kg	19.1 Copper					3000	5	15.7
				mg/kg	6480 Iron					~	20	35600
				mg/kg	25.5 Lead					400	0.6	39
				mg/kg	275 Manganese					11000	3	1030
				mg/kg	599 Potassium					~	1000	6180
				mg/kg	7.1 Vanadium					560	10	66
				mg/kg	37 Zinc					24000	4	101
				ug/g		3.08 Chlorides						
				pci/g						~	~	36.1
				pci/g						~	~	~
				pci/g						~	~	~
				pci/g			0.0022 PU-239			18	~	0.052
				ug/g			2.43 U (Total)			160	~	2.09
				mg/kg					.031 Acetone	8000	0.01	~

Boldface values at or above SALs
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MEASURED CONCENTRATIONS OF COPCs FOR OU 1093

PRS	Sample Number	Location ID	Sample Type	Units	Metals	Nitrates/ Chlorides	Radionuclides	SVOCs	VOCs	SALs	CRQLs	Background
Drainfield	AAB4636	18-1234	Soil	mg/kg	2710 Aluminum(J)			None Detected		~	40	58900
			5-10 ft	mg/kg	1.2 Arsenic					~	2	11.6
				mg/kg	52.9 Barium					5600	40	1140
				mg/kg	968 Calcium					~	1000	54400
				mg/kg	16 Chromium					400	10	34.2
				mg/kg	9.4 Copper					3000	5	15.7
				mg/kg	6700 Iron					~	20	35600
				mg/kg	11 Lead					400	0.6	39
				mg/kg	294 Manganese					11000	3	1030
				mg/kg	5.4 Nickel					1600	8	26.7
				mg/kg	8.1 Vanadium					560	10	66
				mg/kg	27.3 Zinc					24000	4	101
				ug/g		5.16 Chlorides						
				pci/g						~	~	36.1
				pci/g						~	~	~
				pci/g						~	~	~
				pci/g			0.0023 PU-238			20	~	0.014
				pci/g			0.005 PU-239			18	~	0.052
				pci/g						~	~	~
				ug/g			2.15 U (Total)			160	~	2.09
				mg/kg					.041 Acetone	8000	0.01	~
Drainfield	AAB4639	18-1234	Water	ug/L	1590 Aluminum(J)			None Detected	None Detected	~	40	58900
				ug/L	2190 Calcium					~	1000	54400
				ug/L	1090 Iron					~	20	35600
				ug/L	4.1 Lead					400	0.6	39
				ug/L	5670 Magnesium					~	1000	16100
				ug/L	194 Manganese					11000	3	1030
				ug/L	20,500 Sodium					~	1000	1880
				ug/L	238 Zinc					24000	4	101
				ug/L		944 Nitrates						
				ug/L		28.2 Chlorides						
				pci/L			0.0917 PU-239			18	~	0.052
Background	AAB2435	18-1060	Soil	ug/g		<1.04 Cl						
Well BG1			2-4 ft	ug/g		2.38 N03						
Background	AAB2437	18-1060	Soil	ug/g		1.83 Cl						
Well BG1			7-9 ft	ug/g		<1.06 N02/N03						
Background	AAB2439	18-1060	Soil	ug/g		4.68 Cl						
Well BG1			12-14 ft	ug/g		<1.12 N02/N03						
Background	AAB2442	18-1060	Water	ug/L		15.5 mg/L Cl						
Well BG1				ug/L		99.7 ug/L N02/N03						

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MEASURED CONCENTRATIONS OF COPCs FOR OU 1093

PRS	Sample Number	Location ID	Sample Type	Units	Metals	Nitrates/ Chlorides	Radionuclides	SVOCs	VOCs	SALs	CRQLs	Background
Background	AAB2443	18-1063	Soil	ug/g		<2.59 Cl						
Well BG2			2-4 ft	ug/g		1.02 N03						
Background	AAB2445	18-1063	Soil	ug/g		19.8 Cl						
Well BG2			7-9 ft	ug/g		10.3 N03						
Background	AAB2447	18-1063	Soil	ug/g		16.8 Cl						
Well BG2			12-14 ft	ug/g		13.7 N03						
Background	AAB2450	18-1063	Water	ug/L		24.2 mg/L Cl						
Well BG2				ug/L		<5 ug/L N03						

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