HSWA LANL 1/1106/21 /21-024(c;i)/t-21-027(c)

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: June 9, 1998
Refer to: EM/ER:98-187

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87501

SUBJECT: IA PLAN FOR TA-21, PRS 21-024(i) ACTIVITIES (FORMER OU 1106, FU 1)

Dear Mr. Garcia:

Enclosed for your information, please find a copy of the Interim Action Plan for Technical Area 21, Potential Release Site 21-024(i) activities. The need for this activity was identified because of the high erosion potential (AP 4.5 score 59) and known contamination at the site. This activity is planned for completion in Fiscal Year 1998.

If you have any questions, please call Dave McInroy at 667-0819 or Joe Mose at 667-5808.

Sincerely,

Julie A. Canepa, Program Manager
LANL/ER Project

Sincerely,

Theodore J. Taylor, Program Manager
DOE/LAAO

JC/TT/rfr

Enclosure: (1) IA Plan for TA-21, PRS 21-024(i)

Cy (w/ enc.):
D. Neleigh, EPA, R.6, 6PD-N
S. Dinwiddie, NMED-HRMB
M. Leavitt, NMED-GWQB
J. Parker, NMED-HRMB
G. Saums, NMED-SWQB
S. Yanicak, NMED-AIP, MS J993

Cy (w/o enc.):
T. Baca, EM, MS J591
T. George, EM/ER, MS M992
T. Longo, DOE-HQ, EM-453
D. McInroy, EM/ER, MS M992
G. McMath, CST-7, MS E525
J. Mose, LAAO, MS A316
J. Plum, LAAO, MS A316
G. Rael, AL-ERD, MS A906
C. Rodriguez, CIO/ER, MS M992
P. Schumann, ESH-19, MS M992
T. Taylor, LAAO, MS A316
T. Trujillo, AL-ERD, MS A906
J. Vozella, LAAO, MS A316
J. White, ESH-19, MS K490
EM/ER File, MS M992
RPF, MS M707

Interim Action Plan for Potential Release Site 21-024(i)

Environmental
Restoration
Project

April 28, 1998

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-98-1896

This page intentionally left blank.

TABLE OF CONTENTS

1.0 RATIONALE and OBJECTIVE of INTERIM ACTION

This interim action plan addresses a proposed interim action at potential release site (PRS) 21-024(i) at Los Alamos National Laboratory (LANL) Technical Area (TA) 21. This PRS consists of an abandoned septic system and its associated outfall. This site in its present condition poses a potential threat to human health and the environment because contaminants could migrate outside the septic tank and associated lines. This plan describes the site and its history, previous investigations, the proposed details of the interim action, confirmation sampling, waste management issues, site restoration, and the schedule and cost for completing the interim action.

1.1 Rationale for Proposed Interim Action

Phase I and Phase II investigations have revealed the following problems with PRS 21-024(i):

- The contents of a septic tank were not removed when the system was abandoned in 1965. The contaminated contents include radionuclides, metals, semivolatile organic compounds, and polychlorinated biphenyl (PCBs). While these materials are not classified as hazardous waste, they are not contained in a manner that would be considered protective.
- Elevated tritium levels and organic contaminates found in boreholes near the septic tank and lines indicate that the system may pose a risk of release to the environment.
- Radionuclides, metals, and PCBs are present in the outfall.
- The radioactivity, metals, and PCBs in the outfall are not contained and could potentially migrate, creating a threat to human health and the environment.

PRS 21-024(i) has also been evaluated for water quality concerns under LANL-ER Administrative Procedure (AP) 4.5. The site received a score of 59 and has been reviewed by the Surface Water Assessment Team.

The proposed interim action is to remove the septic tank as well as portions of the associated outfall to prevent any contaminant migration. This action is consistent with DOE's as-low-as-reasonably-achievable program to reduce radiation exposures to workers and the public. This interim action should also reduce the potential migration of other nonradiological contaminants.

1.2 Objective of Interim Action

Because of adjacent PRSs and commingling of contamination downgradient from PRS 21-024(i), this interim action cannot be considered a final remedy. The objective of this interim action is remove the major sources of contamination and stabilize PRS 21-024(i) until a final remedy is conceived of. The proposed final remedy will be based on further evaluations of adjacent PRSs for human health, ecological, and water quality issues.

2.0 SITE DESCRIPTION and CHARACTERIZATION DATA

2.1 Site Type and Description

PRS 21-024(i) is a solid waste management unit (SWMU) listed in the Hazardous and Solid Waste Amendments (HSWA) Module of LANL's Resource Conservation Recovery Act (RCRA) Part B operating permit. PRS 21-024(i) is an abandoned septic tank and outfall, as shown in the site map found in Annex 9.1 of this report. For planning purposes, PRS 21-024(i) has been divided into three areas: the septic tank with influent and effluent lines, the outfall area on the mesa top between the septic tank outlet line and the mesa edge, and the bench area beneath the mesa top and above Los Alamos Canyon.

2.1.1 Operational History

PRS 21-024(i) was a septic system that operated between 1945 and 1965. The system routed waste southeast from the research laboratory in building TA-21-152, through a concrete septic tank to a surface outfall (see Figure 9.1-1). The lines and septic system were abandoned in place in 1965 when building TA-21-209 was built and the present sewer system was put in place. Blow-down water from cooling towers contained in buildings TA-21-166 and TA-21-167 was also routed to this septic system via a main line from building TA-21-152. Effluent from the building and cooling towers was routed through a 6-in. vitrified-clay pipe (VCP) into the concrete septic tank (5 ft x 10 ft x 6 ft), flowed out through a 6-in. VCP pipe, and was discharged onto a broad, gentle slope about 60 ft from the south edge of DP Mesa. Typically the septic systems in place at TA-21 during this time serviced a variety of floor drains, janitorial sinks, showers, and toilets.

2.2 RFI Information and Other Decision Data

In 1992, a radiation survey was conducted and six soil samples were collected from three locations at PRS 21-024(i). In 1993, a more detailed radiation survey was performed: eleven soil samples were collected from eight locations, and a 20-ft deep borehole was drilled 2 to 3 ft south of the tank and sampled at 5-ft intervals. The results of these investigations were reported in the Phase Report 1C, TA-21 Operable Unit RCRA Facility Investigation (RFI) (LANL 1994, 1260) and Addendum, Phase Report 1C, TA-21 Operable Unit RFI (LANL 1995, 1261). All sample locations are shown in Figure 9.1-1. Samples were analyzed for metals, organic compounds, and radionuclides. Results of radiation surveys indicate that elevated levels of alpha-emitting radionuclides are present in the drainage channel beneath the 21-024(i) outfall line. Results of laboratory analyses showed metals (arsenic, lead, chromium, and barium) and radionuclides at levels greater than background.

The results of the 1992 and 1993 investigations also suggested a discrepancy between the radiation survey results and analytical laboratory results. The sum of isotopic activities from soil samples analyzed in off-site laboratories did not account for the elevated gross radiation levels detected with field instruments. Based on this information, further investigation was recommended for radioactive contamination (LANL 1995, 1261). A Phase II sampling and analysis plan (SAP) for PRS 21-024(i) (LA-UR-95-4259) was prepared in 1995 as a result of administrative authority (AA) comments on the Phase I RFI report. As requested by the AA, this SAP was intended to address both the radioactive contamination and the greater-than-background arsenic levels detected in the earlier investigations.

During the Phase II investigation, the septic tank was opened and sampled to identify the contaminants present in the tank. The tank itself was found to contain approximately 10 yd^3 of sludge with several inches of free standing water on top. Both the sludge and water were sampled for waste characterization. Visual

inspection and sampling of the tank contents and adjacent soil indicated that although the tank appeared to be intact, some migration of tritium and other compounds may have occurred. Sampling of the soil directly under the tank has not been performed. However, the elevated tritium (1186 pCi/l), organic compounds (Benzidine: 1.8 ppm, trichlorobenzene: 5 ppb) and metals (mercury: 1.7 ppm) in boreholes adjacent to the tank indicate that a contamination release may be present directly under the tank or associated lines.

In 1997 a radiological survey was conducted over the entire outfall area. The radiological survey identified sampling locations and confirmed the topographical limits to lateral migration. The results of the radiological survey were used in conjunction with visual inspection of sediment deposits to determine sample locations. Seventeen locations were identified to have elevated radiological readings and sediment deposits that contained material amounts adequate for sampling. The outfall was then sampled for radioactive isotopes (thorium, uranium, and plutonium), gamma spectroscopy, metals, semivolatile organic compounds, and PCBs. The sampling map in Annex 9.1 (Figure 9.1-2) shows the radiological survey results and sample locations with maximum values for nonradiological chemicals of potential concern (COPCs) for that location. Sampling locations within the survey area were sampled every six inches until the welded tuff soil interface was reached to bound the vertical extent of contamination. To assess the migration of contaminants into tuff, two sample locations were sampled six inches into the tuff (sample locations 21-05334 and 21-05325). Analytical results indicated no significant migration has occurred past the tuff interface.

3.0 INTERIM ACTION

3.1 Description of the Proposed Interim Action

An absorbent will be added to the septic tank's contents to stabilize any free-standing water associated with the sludge. The sludge will then be removed and containerized. After removing the sludge, the concrete tank will then be broken up into workable chunks and removed. Any soil showing elevated radioactivity will also be removed. Portions of the outlet line that are exposed during the excavation will be removed. The inlet line will be removed approximately 20 to 30 feet back from tank. This will allow inspection and evaluation of the line so that planning for the final remedy can be done. After removing the inlet line and a visual inspection, the remaining line will be grouted to prevent migration of any remaining line contents.

Soil that has been identified as having above-background radionuclides in the mesa top portion of the outfall will be removed. Soil will be removed by heavy equipment and containerized for disposal. Any vegetation removed to allow equipment access to the site will be screened for radioactivity. If safe, the vegetation will be chipped for site restoration soil enhancement. Soil will be removed until no elevated radioactivity is detected by a field instrument for detection of low energy radiation (FIDLER).

3.2 Site Restoration

Following interim action activities, the site will be restored to its preremediation condition. The tank and lines excavation areas will be backfilled with clean fill and restored to original condition. The excavated outfall area will be covered by clean fill and revegetated. All excavated areas will be surveyed and marked, and a 1 to 2 in. layer of gravel will be placed on excavated surfaces before the backfill is put in place. This will allow easy recognition of remediated areas for future investigations. Erosion control matting and/or

straw bales will be placed in appropriate areas to reduce erosion and encourage revegetation. Regrading will also be performed to prevent storm water run-on from crossing the site.

3.3 Additional Investigation

After interim action activities, additional samples will be taken on bench area beneath the mesa top to assess the following:

- The nature and extent of PCB contamination.
- The extent of mercury contamination and the possible contribution of mercury from other nearby PRSs.
- The nature and extent of other metals and radionuclides

4.0 SAMPLING AND MONITORING ACTIVITIES

4.1 Problem Definition

Sampling PRS 21-024(i) after remediation activities will ensure that interim action objectives were met and assess the need for further remediation or investigation. Samples will be taken around the footprint of the septic tank and its lines, as well as around the outfall.

4.2 Sampling: Septic Tank and Lines

Samples will be taken at four locations within the footprint of the septic tank after it has been removed. Samples will be taken at 0 to 12 in. and 12 to 24 in. intervals at each location. Additional samples will be taken at each of the four vertical edges of the excavation to evaluate if any migration has occurred from the tank. Samples will be analyzed for metals, gamma-emitting radionuclides, isotopic uranium, tritium, semivolatile and volatile organic chemicals, and PCBs/pesticides.

4.3 Sampling: Outfall Soil

A radiation survey will be performed on the excavated area at the 21-024(i) outfall. The survey will be performed using FIDLER; results will be used to determine if site (TA-21) background radiation levels have been achieved. Samples will be collected in a random grid pattern across the survey area and also outside the excavated area to assess the post-interim action conditions so that effective planning for the final remedy can be done. The number of samples to be taken will depend on the amount of area remediated. At each sampling location, material will be collected every 6 in. to a depth of 1 ft below the surface of the tuff. Samples will be analyzed for gross alpha/beta radioactivity, metals, gamma-emitting radionuclides, isotopic uranium and thorium, tritium, semivolatile and volatile organic chemicals, and PCBs/pesticides.

5.0 MAINTENANCE and INSPECTION

Periodic inspections and maintenance will be performed on the contoured and revegetated mesa top to insure that erosion and storm water run-on does not occur.

6.0 WASTE MANAGEMENT

6.1 Estimated Types and Volumes of Waste

TABLE 6.1-1

TYPES AND VOLUMES OF WASTE

Item	Waste Type	Volume Estimate
Concrete debris/VCP	Solid waste, low-level radioactive waste.	6 yd^3
Sludge	Solid waste, low level radioactive/PCB waste.	10 yd^3
Soil	Solid waste, low-level radioactive/PCB waste.	50 yd^3
Personal protective equipment (PPE)	Solid waste, low-level radioactive/PCB waste.	2 yd^3

6.2 Method of Management and Disposal

6.2.1 Septic Tank and Lines

Excavating the septic tank will generate approximately 10 yd^3 of sludge containing organic, metal, PCB, and radiological contaminants. The sludge will be stabilized for liquid content and placed in B-25 boxes for transport and disposal at TA-54. The tank removal will produce approximately 6 yd^3 of debris (concrete) and soil. Other solid waste generated will include disposable coveralls, gloves, paper towels, plastic sheeting, and other miscellaneous debris.

The VCP piping will be containerized and taken to TA-54 for disposal. Additional waste sampling may be needed if a large amount of sludge or waste is found to be remaining inside the lines associated with the septic tank. Any associated soil removed with the lines will be containerized and sampled for waste characterization before disposal at TA-54.

6.2.2 Outfall

Soil removal at the outfall may generate up to 50 yd^3 of contaminated material. This soil will be containerized in B-25 boxes for transport to TA-54 for disposal. Other solid waste generated will include disposable coveralls, gloves, paper towels, plastic sheeting, and other miscellaneous debris.

7.0 SCHEDULE AND COST

Interim action field operations at PRS 21-024(i) are scheduled to begin in May 1998. Septic tank, sludge, and soil removal from of the outfall, as well as associated site restoration, will take approximately three weeks. The interim action should be complete by May 31, 1998.

Uncertainties that may extend the time period of the interim activities include the unknown extent of contamination beneath the septic tank and lines.

The following costs have been estimated for PRS 21-024(i).

TABLE 7.0

ESTIMATED COSTS FOR THE INTERIM ACTION AT 21-024(i).

Activity	Cost
Pre-field activities	$12,300
Field activities	$67,500
Waste management and disposal	$75,400
Sampling and analyses	$10,200
Post-field activities	$39,700
Total	**$205,100**

8.0 REFERENCES

LANL (Los Alamos National Laboratory), February 28, 1994. "Phase Report 1C, TA-21 Operable Unit RCRA Facility Investigation, Outfalls Investigation," Los Alamos National Laboratory Report LA-UR-94-228, Los Alamos, New Mexico. (LANL 1994, 1260)

LANL (Los Alamos National Laboratory), January 1995. "Phase Report Addendum 1B and 1C Operable Unit 1106 RCRA Facility Investigation," Los Alamos National Laboratory Report LA-UR-94-4360, Los Alamos, New Mexico. (LANL 1995, 1261)

LANL (Los Alamos National Laboratory), January 1996. "Sampling and Analysis Plan for Potential Release Site 21-024(I) Septic System and Outfall" LA-UR-4259.

9.0 ANNEXES

9.1 Site and Sampling Maps

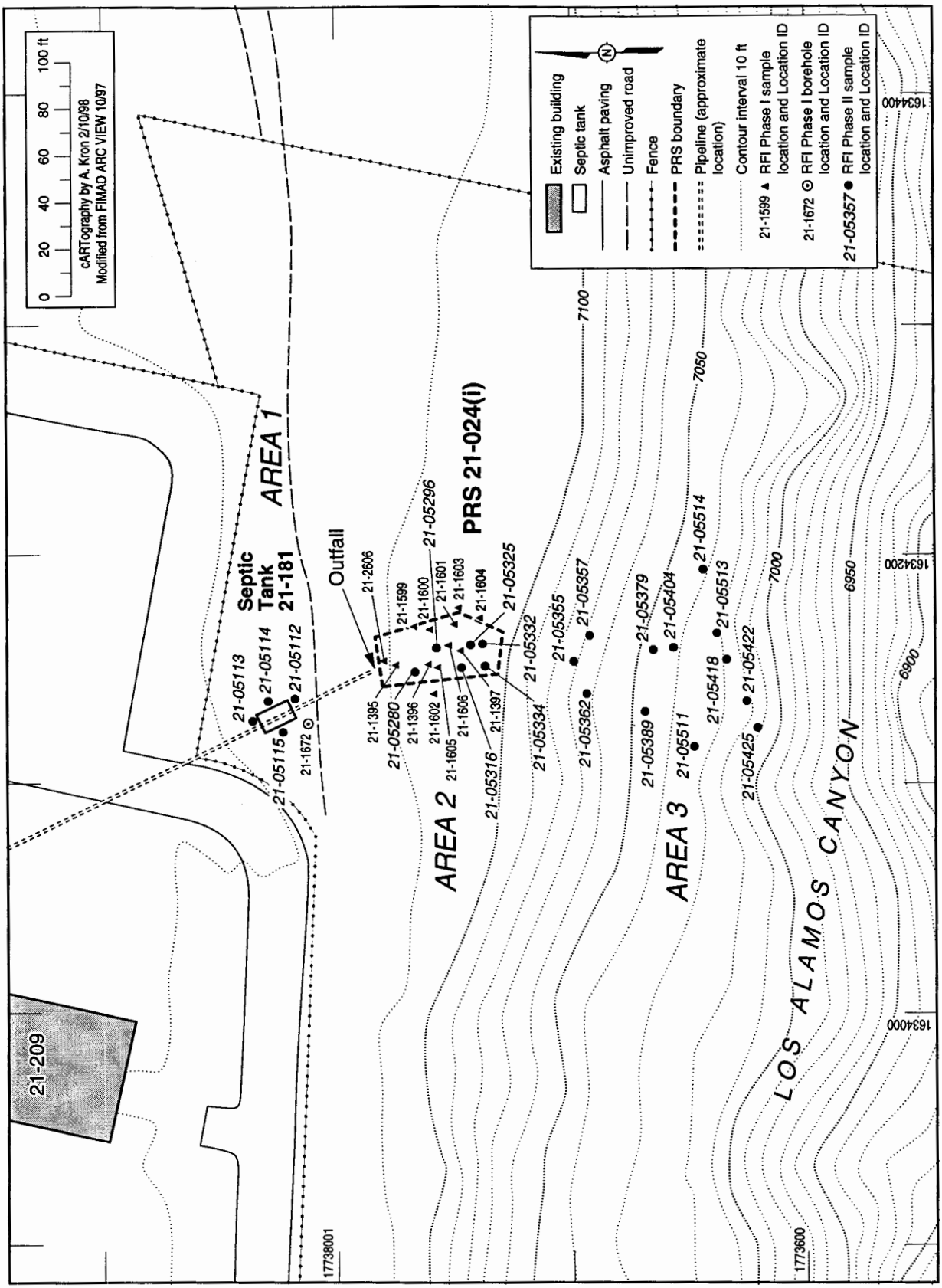

Figure 9.1-1. PRS 21-024(i) Site Map

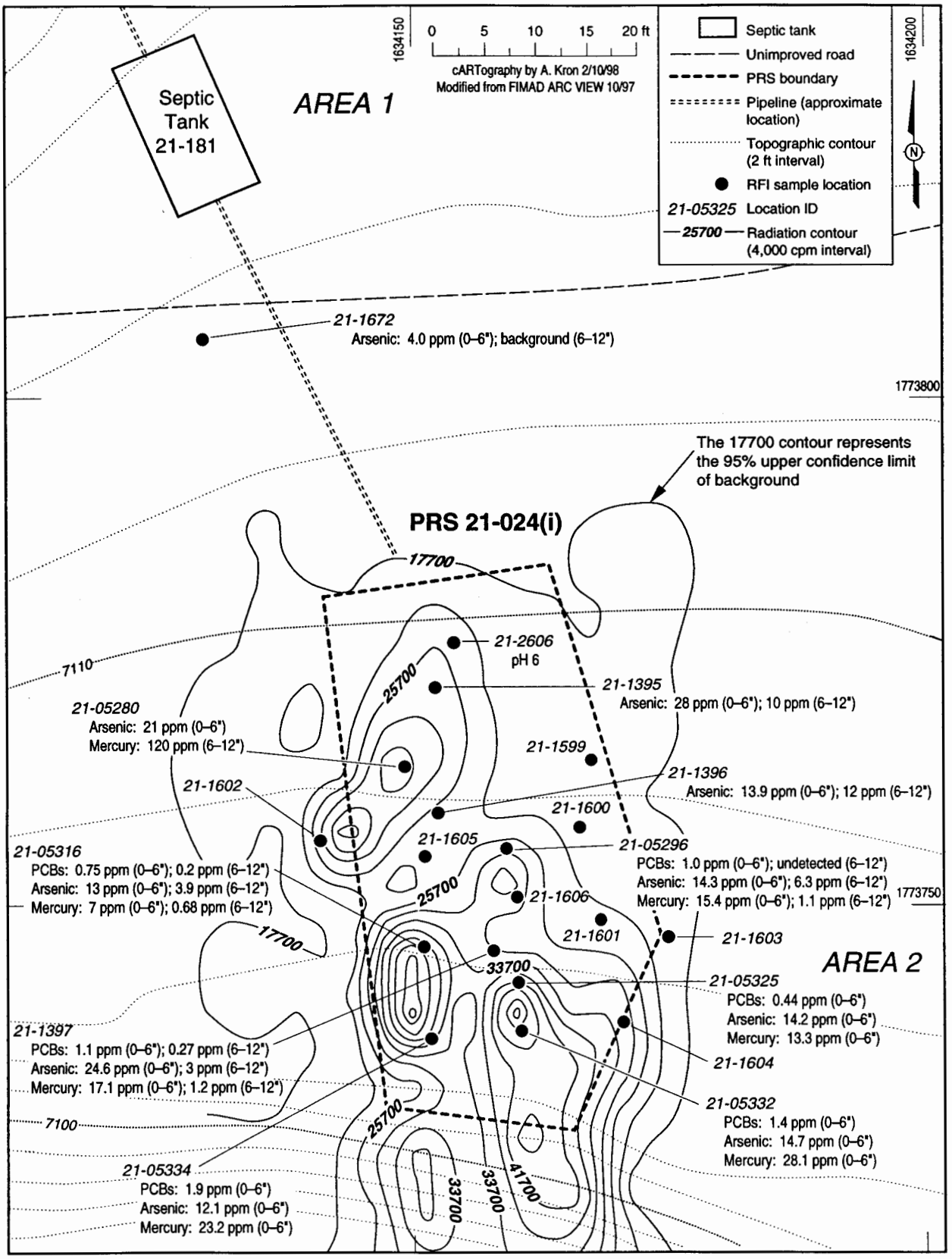

Figure 9.1-2. PRS 21-024(i) Sampling Map

9.2 Implementation SOPs

ER-SOP-01.01	General Instructions for Field Investigations
ER-SOP-01.10	Waste Characterization
ER-SOP-10.04	FIDLER Instrument System