

LANL
HSWA
FU 1
TA 21
⑦

ERM/Golder Los Alamos Project Team
July 27, 1995

Voluntary Corrective Action Plan
for Potential Release Sites at TA-21 Septic Tanks

Sites under Field Unit 1 at TA-21

21-024(b), Septic Tank

21-024(d), Septic Tank

21-024(h), Septic Tank

1.0 INTRODUCTION

The following potential release sites (PRSs) at Los Alamos National Laboratory (LANL) have been selected for voluntary corrective action (VCA) because their remedies are obvious, are easily implemented, and will prevent transport of contaminated soil into the canyon, which might result in violation of state water quality regulations. These voluntary corrective actions have been grouped in a single plan because they are similar and located within the same technical area. The tasks in this action plan include assessing the extent of plutonium-239 contamination and removing contaminated structures and soil.

1.1 Field Unit 1, PRS 21-024(b)

The septic system at PRS 21-024(b) routed sewage from Building TA-21-17 (removed in 1969) through a concrete septic tank to the ground surface south of Building TA-21-5. The outfall is a short, cast iron pipe emerging 70 ft from the cliff edge with no clearly defined drainage channel. The septic tank and outlet pipe are not visible but were located and monitored during the RCRA facility investigation. A road, flanked by security fences and linking secured areas at TA-21, runs next to the site.

In 1992, a radiation survey was conducted and soil samples were collected from the drainage area at three depths from three locations. In 1993, a shallow borehole was advanced near the septic tank and samples were collected at four depths. Samples from both years were analyzed for radionuclides, metals, semivolatile organic compounds, and volatile organic compounds.

Results of these investigations [presented in *Phase Report Addendum 1B and 1C: Operable Unit 1106 RCRA Facility Investigation* (January 1995)] suggest that the only contaminant present at levels greater than LANL screening action levels is plutonium-239. (The screening action level for plutonium-239 is 18 pCi/g.) Soil samples collected in 1992 near the canyon edge had 324 pCi/g of plutonium-239 in the 0-to-6-in. depth, 145 pCi/g in the 6-to-12-in. depth, and 84 pCi/g in the 12-to-18-in. depth. Soil samples collected midway between the septic tank and the canyon edge had 36 pCi/g of plutonium in the 0-to-6-in. depth and less than the screening

10198



action level in the 6-to-12-in. and 12-to-18-in. depths. Soil samples collected near the septic tank had 22 pCi/g of plutonium-239 in the 0-to-6-in. depth and less than the screening action level in the 6-to-12-in. and 12-to-18-in. depths. Borehole samples collected in 1993 adjacent to the tank outlet had 29 pCi/g of plutonium-239 in the 4-to-6-ft depth and less than the screening action level in the 0-to-2-ft, 2-to-4-ft, and 6-to-8-ft depths.

Because the site has radioactive contamination only, it was proposed to EPA that no further action be taken for RCRA constituents and a risk assessment be performed for radioactivity in the document *Phase Report Addendum 1B and 1C: Operable Unit 1106 RCRA Facility Investigation* (January 1995). This proposal was accepted and a request for a Class 3 modification to the HSWA permit was recommended by EPA in a notice of deficiency (March 1995).

1.2 Field Unit 1, PRS 21-024(d)

The septic system at PRS 21-024(d) routed sewage from Building TA-21-1 (removed in 1965) through a concrete septic tank to the ground surface on the south rim above Los Alamos Canyon. The outfall terminates at the cliff edge. This septic tank is visible, open at the top, and filled with pieces of concrete, dirt, and rainwater. The outlet pipe is also visible.

In 1992, a radiation survey was conducted and soil samples were collected from the drainage area at a single depth from one location and at three depths from another location. In 1993, a shallow borehole was advanced near the septic tank and samples were collected at four depths. Samples from both years were analyzed for radionuclides, metals, semivolatile organic compounds, and volatile organic compounds.

Results of these investigations [presented in *Phase Report Addendum 1B and 1C: Operable Unit 1106 RCRA Facility Investigation* (January 1995)] suggest that the only contaminant present at levels greater than LANL screening action levels is plutonium-239. (The screening action level for plutonium-239 is 18 pCi/g.) Soil samples collected in 1992 from the bench below the canyon edge had 34 pCi/g of plutonium-239 in the 0-to-6-in. depth and less than the screening action level in the 6-to-12-in. and 12-to-18-in. depths. The soil sample collected near the septic tank had less than the screening action level in the 0-to-6-in. depth. Borehole samples collected in 1993 adjacent to the tank outlet had 27 pCi/g of plutonium-239 in the 0-to-2-ft depth, 34 pCi/g in the 2-to-4-ft depth, and less than the screening action level in the 4-to-6-ft and 6-to-8-ft depths.

Because the site has radioactive contamination only, it was proposed to EPA that no further action be taken for RCRA constituents and corrective action be taken for radioactivity in the document *Phase Report Addendum 1B and 1C: Operable Unit 1106 RCRA Facility Investigation* (January 1995). This proposal was accepted and a request for a Class 3 modification to the HSWA permit was recommended by EPA in a notice of deficiency (March 1995).

1.3 Field Unit 1, PRS 21-024(h)

The septic system at PRS 21-024(h) discharged sewage from Building TA-21-151 through a concrete septic tank (abandoned in place in 1966) to the ground surface on the north rim of DP Mesa. Vitrified clay pipes carried effluent to the septic tank and then to the outfall. A corner of the septic tank is visible; the outlet pipe is not. The tank is under the road that provides access to the TA-21 sewage treatment plant.

In 1992, a radiation survey was conducted and soil samples were collected from the drainage area at two depths from one location and at three depths from two locations. In 1993, a shallow borehole was advanced near the septic tank and samples were collected at four depths. Samples from both years were analyzed for radionuclides, metals, semivolatile organic compounds, and volatile organic compounds.

Results of these investigations [presented in *Phase Report Addendum 1B and 1C: Operable Unit 1106 RCRA Facility Investigation* (January 1995)] suggest that the only contaminant present at levels greater than screening action levels is plutonium-239. (The screening action level for plutonium-239 is 18 pCi/g.) Soil samples collected in 1992 midway between the septic tank and the canyon edge had 33 pCi/g of plutonium-239 in the 6-to-12-in. depth and less than the screening action level in the 0-to-6-in. and 12-to-18-in. depths. Soil samples collected near the septic tank and near the canyon edge had less than the screening action level for plutonium-239 in all three depths. Borehole samples taken in 1993 adjacent to the tank outlet had less than the screening action level for plutonium-239 greater in all four depths.

Because the site has radioactive contamination only, it was proposed to EPA that no further action be taken for RCRA constituents and a risk assessment be performed for radioactivity in the document *Phase Report Addendum 1B and 1C: Operable Unit 1106 RCRA Facility Investigation* (January 1995). In a notice of deficiency (March 1995), EPA deferred accepting this proposal until information related to blank contamination could be presented. This information was provided in LANL's April 1995 response to EPA's notice of deficiency. With this information, EPA is expected to accept the proposal for no further action with a risk assessment for radioactivity and to recommend a request for a Class 3 modification to the HSWA permit.

2.0 SITE TYPE AND DESCRIPTION

A map of these sites is shown in Figure 2.1. Table 2.1 identifies each site and includes a description of each site location, site type, and waste type.

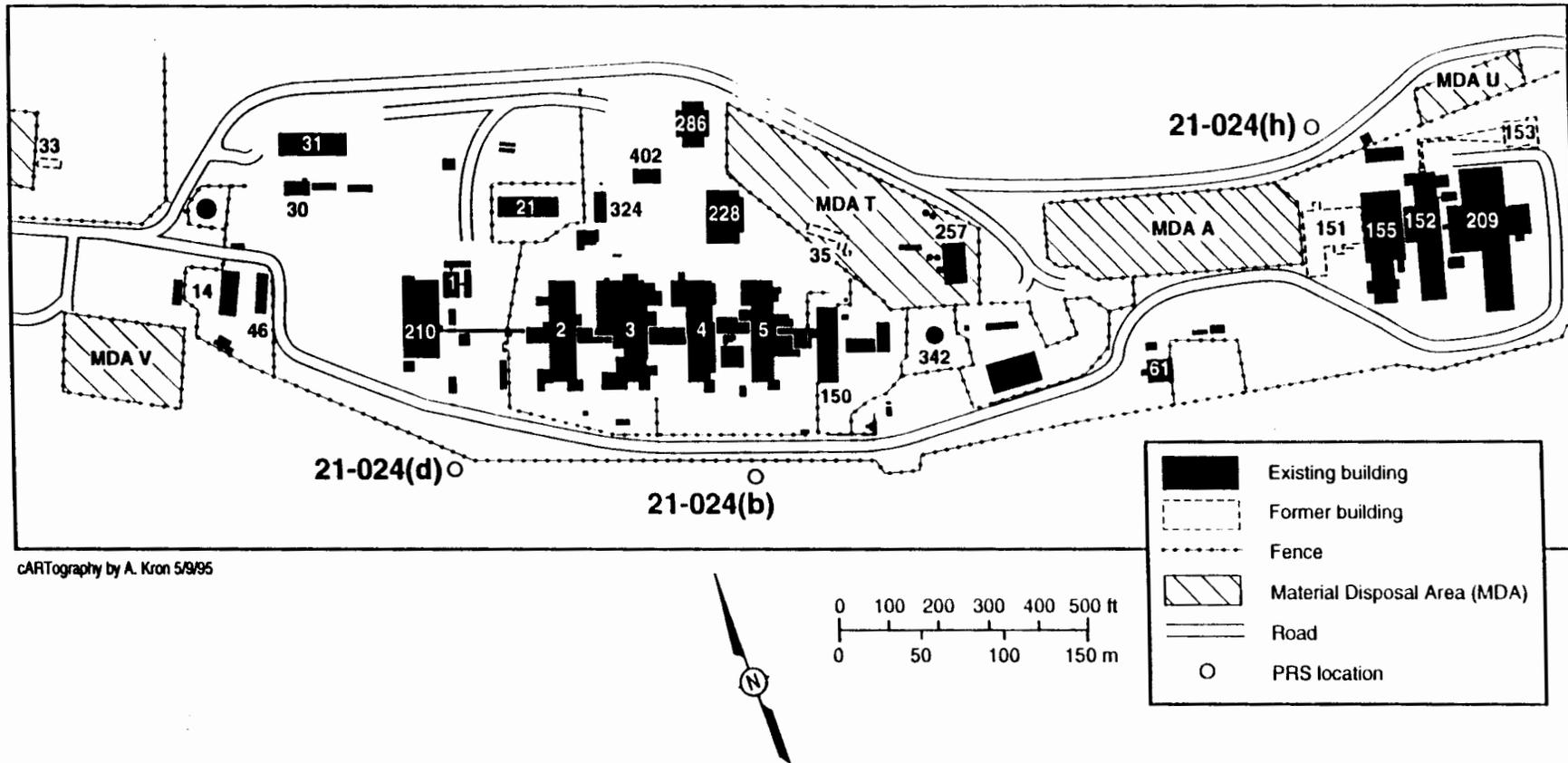


Figure 2.1 TA-21 sites proposed for Voluntary Corrective Action.

Table 2.1. Site Type and Description

No.	Field Unit	PRS Number	PRS Location (State Planar Coordinates)	PRS Type/ Description	Waste Type/ Description
1	1	21-024(b)	1632466.2, 1774055.9, 7134.9	Septic System/ Outfall	Soil, Pipe, Septic Tank Sludge, PPE, Decon Liquid
2	1	21-024(d)	1631879.7, 1774229.0, 7136.3	Septic System/ Outfall	Soil, Pipe, Septic Tank Sludge, PPE, Decon Liquid
3	1	21-024(h)	1633698.9, 1774309.8, 7116.8	Septic System/ Outfall	Soil, Pipe, Septic Tank Sludge, PPE, Decon Liquid

3.0 PROPOSED REMEDY

These potential release sites are listed in the Laboratory's Hazardous and Solid Waste Amendments (HSWA) permit; however, all three sites have been proposed for removal from the permit (a Class 3 modification) because no hazardous constituents are present, as discussed in the document *Phase Report 1C: TA-21 Operable Unit RCRA Facility Investigation Outfalls Investigation* (February 28, 1994). The proposed voluntary corrective actions address radiological contamination (plutonium-239) only. Field screening and analysis will be used to confirm the extent of radiological contamination.

Radioactively contaminated material will be managed and prepared for disposal as low-level radioactive waste. All other waste will be managed as nonhazardous solid waste. Uncontaminated soil will be left on-site; other nonhazardous construction debris will be properly disposed of at an industrial waste landfill. A single waste characterization scheme is being prepared for all three sites.

Disturbance of existing vegetation will be minimized. Clean fill material may be obtained from areas on-site or may be brought in from off-site. Each site disturbance will be regraded to adjacent contours and revegetated.

Future land use for these sites will continue to be industrial. The minimum cleanup level for these sites will be the same as that adopted by the TA-21 decontamination and decommissioning project, 75 pCi/g of plutonium-239. This level was calculated using a dose-based method¹, in accordance with DOE Order 5400.5. Field instruments will be chosen based on their ability to detect plutonium-239 at this level.

Before beginning corrective actions, each site will be assessed using hand-held field instruments to define the extent of contaminated soil or structures. Contaminated areas will be clearly identified in the field, and all field personnel will be familiarized with each site before corrective actions begin. Field personnel will wear modified Level D personnel protective equipment.

¹ Code for Calculating Residual Radioactivity in Soil Ver. 5.60 (RESRAD 5.60), Washington, D. C.: U. S. Department of Energy

During corrective action, samples collected will be screened in the field using hand-held instruments. A percentage of these samples, including those suspected of contamination at levels greater than the cleanup level, will be analyzed at a mobile radiological laboratory.

3.1 PRS 21-024(b), Septic Tank #1

The proposed remedy for this site is removal of soil, septic tank contents, and structures that are contaminated in excess of cleanup criteria. Our approach requires that the road beside the site, which links secured areas of TA-21, be closed (possibly over a weekend) while it is excavated to expose the septic tank for sampling and possible cleanup.

The septic tank will be uncovered and its contents sampled using a hand auger or other appropriate method. Samples will be screened in the field for plutonium-239 using hand-held instruments (gross alpha and FIDLER) and mobile laboratory techniques (gross alpha screening). No hazardous constituents are expected; however, to characterize the tank's contents for waste disposal, samples will be analyzed in accordance with the waste characterization strategy. If sample results indicate the contents of the septic tank are contaminated, the tank will be cleaned out, monitored to ascertain that it is no longer contaminated, and filled with pea gravel. If samples indicate the septic tank is not contaminated, the tank will be cleaned out and filled with clean pea gravel for proper abandonment in accordance with the New Mexico Waste Water Bureau's Uniform Plumbing Code. (If the tank was previously filled for abandonment and the fill meets abandonment requirements, it will be opened and sampled but not cleaned out.)

If samples indicate the septic tank contents are contaminated, the inlet pipe will be excavated and removed to the extent practicable, considering its proximity to the access road and security fence. The end of the inlet pipe will be grouted, and the remaining pipe will be proposed for removal, if necessary, during decommissioning and decontamination activities. Soil beneath the pipe will be sampled using a spade and scoop, hand auger, or other appropriate method and screened for plutonium-239 using hand-held field instruments and mobile laboratory techniques. If plutonium-239 at levels greater than the cleanup level is indicated, the soil will be removed until the cleanup level is met, as indicated by hand-held field instruments. If plutonium-239 at levels less than the cleanup level is indicated, no further action will be taken.

An east-west trench will be excavated approximately 15 ft south of the septic tank to locate the outlet pipe. Sections of the pipe will be removed, and the inside of the pipe will be screened for plutonium-239 using hand-held field instruments. Soil beneath pipe joints will be sampled using a spade and scoop, hand auger, or other appropriate method. These samples will be screened for plutonium-239 using hand-held field instruments and mobile laboratory techniques. If plutonium-239 at levels greater than the cleanup level is indicated, the entire pipe will be removed. Soil around the pipe will be excavated until the cleanup level is met, as indicated by hand-

held field instruments. If plutonium-239 at levels less than the cleanup level is indicated, the removed pipe will be disposed of as uncontaminated waste. the trench will be filled with clean fill, and the remaining pipe will be abandoned in place.

In the drainage or outfall area, soil contaminated with plutonium-239 may erode and be transported into the canyon, possibly in violation of state water quality regulations; therefore, plutonium-239 contamination will be removed to the extent possible, even if it is found at levels less than the cleanup level. The drainage area will be surveyed for plutonium-239 on the mesa and cliff face below using hand-held field instruments. If plutonium-239 levels are elevated, as indicated by hand-held field instruments, soil will be excavated until elevated levels are no longer detected. If plutonium-239 levels are not elevated, as indicated by hand-held field instruments, no further action will be taken.

3.2 PRS 21-024(d), Septic Tank #2

The proposed remedy for this site, which does not have plutonium-239 contamination outside the septic tank in excess of the cleanup level, is to abandon the septic tank in accordance with New Mexico requirements. Our approach is to obtain samples of the tank's contents using a hand auger or other appropriate method. No hazardous constituents are expected; however, to characterize the tank's contents for waste disposal, samples will be analyzed in accordance with the waste characterization strategy. The tank will be cleaned out and filled with clean pea gravel for proper abandonment in accordance with the New Mexico Waste Water Bureau's Uniform Plumbing Code. (If the tank was previously filled for abandonment and the fill meets abandonment requirements, it will be opened and sampled but not cleaned out.)

In the drainage or outfall area, soil contaminated with plutonium-239 may erode and be transported into the canyon, possibly in violation of state water quality regulations; therefore, plutonium-239 contamination will be removed to the extent possible, even if it is found at levels less than the cleanup level. The drainage area will be surveyed for plutonium-239 on the mesa and cliff face below using hand-held field instruments. If plutonium-239 levels are elevated, as indicated by hand-held field instruments, soil will be excavated until elevated levels are no longer detected. If plutonium-239 levels are not elevated, as indicated by hand-held field instruments, no further action will be taken.

3.3 PRS 21-024(h), Septic Tank #3

The proposed remedy for this site, which does not have plutonium-239 contamination outside the septic tank in excess of the cleanup level, is to abandon the septic tank in accordance with New Mexico requirements. Our approach requires that the road near the site, which provides access to the TA-21 sewage treatment plant, be closed for a day at a time. The septic tank will be uncovered and its contents sampled using a hand auger or other appropriate method. No hazardous constituents are

expected; however, to characterize the tank's contents for waste disposal, samples will be analyzed in accordance with the waste characterization strategy. The tank will be cleaned out and filled with clean pea gravel for proper abandonment in accordance with the New Mexico Waste Water Bureau's Uniform Plumbing Code. (If the tank was previously filled for abandonment and the fill meets abandonment requirements, it will be opened but not cleaned out.)

In the drainage or outfall area, soil contaminated with plutonium-239 may erode and be transported into the canyon, possibly in violation of state water quality regulations; therefore, plutonium-239 contamination will be removed to the extent possible, even if it is found at levels less than the cleanup level. The drainage area will be surveyed for plutonium-239 using hand-held field instruments. If plutonium-239 levels are elevated, as indicated by hand-held field instruments, soil will be excavated until elevated levels are no longer detected. If plutonium-239 levels are not elevated, as indicated by hand-held field instruments, no further action will be taken.

4.0 JUSTIFICATION/RATIONALE

These septic tank systems may pose a potential health hazard to on-site workers where levels of plutonium-239 are greater than the cleanup level. The contaminated material associated with these sites is expected to be of low volume and is restricted to an area defined by limited sampling. The cleanup alternatives are obvious, and their implementation is straightforward. Physical access to these sites will be coordinated with organizations that conduct daily activities at TA-21, including the Laboratory's CST and MST divisions and Johnson Controls World Services, Inc.

5.0 ESTIMATED WASTE VOLUMES BY TYPE

Table 5.1 describes each site, waste type, waste description, estimated bulk volume, proposed disposal containers, and anticipated disposal destination.

Table 5.1 Estimated Waste Volumes by Type

No.	Field Unit	PRS Number	Waste Type	Waste Description	Estimated Bulk Volume (yd ³)	Disposal Container Type	Anticipated Disposal
1	1	21-024(b)	Low-Level Radioactive Nonhazardous Solid	Soil, Pipe, Septic Tank Sludge, PPE, Decon Liquid	33	Rolloff Containers or 55-Gal. Drums (as needed for waste segregation)	TA-54 Low-Level Radioactive Waste Disposal Area/ Industrial Landfill
2	1	21-024(d)	Low-Level Radioactive Nonhazardous Solid	Soil, Septic Tank Sludge, PPE, Decon Liquid	38	Rolloff Containers or 55-Gal. Drums (as needed for waste segregation)	TA-54 Low-Level Radioactive Waste Disposal Area/ Industrial Landfill
3	1	21-024(h)	Low-Level Radioactive Nonhazardous Solid	Soil, Septic Tank Sludge, PPE, Decon Liquid	16	Rolloff Containers or 55-Gal. Drums (as needed for waste segregation)	TA-54 Low-Level Radioactive Waste Disposal Area/ Industrial Landfill

6.0 DESCRIPTION OF CONFIRMATORY SAMPLING

Table 6.1 describes each site, details the confirmatory sampling, and provides reference to figures.

If soil contaminated with plutonium-239 at levels greater than the cleanup level (as indicated by hand-held field instruments) is removed, a sample will be taken at that site to confirm that the remaining soil is no longer contaminated. The confirmatory sample will be taken at the septic tank, beneath the outlet line, or in the drainage area, depending on where soil was excavated. At least one and no more than three samples will be taken. Samples will be sent to a fixed laboratory and analyzed for plutonium-239.

Table 6.1 Description of Confirmatory Sampling

No.	Field Unit	PRS Number	Number of Samples	Sampling Location Description	Figure Reference
1	1	21-024(b)	1 - 3	Septic Tank, Outlet Pipe, Drainage Area	6.1
2	1	21-024(d)	1 - 3	Septic Tank, Outlet Pipe, Drainage Area	6.2
3	1	21-024(h)	1 - 3	Septic Tank, Outlet Pipe, Drainage Area	6.3

7.0 ESTIMATED SCHEDULE AND COST TO COMPLETE EACH VCA

Table 7.1 describes each site, estimated schedules, and costs that will be incurred.

Table 7.1 Estimated Schedule and Cost to Complete

No.	Field Unit	PRS Number	Date to Start VCA Process	Date to Complete VCA Process	Estimated Cost of Waste Disposal ^a	Total Estimated Cost
1	1	21-024(b)	4/24/95	10/16/95	\$37,950	\$179,190
2	1	21-024(d)	4/24/95	10/16/95	\$43,700	\$200,142
3	1	21-024(h)	4/24/95	10/16/95	\$18,400	\$132,572

- a Waste disposal costs are based on historical LANL costs (\$1150/yd³); they are estimated assuming waste volume will be 50% of total septic tank and drainage volume.

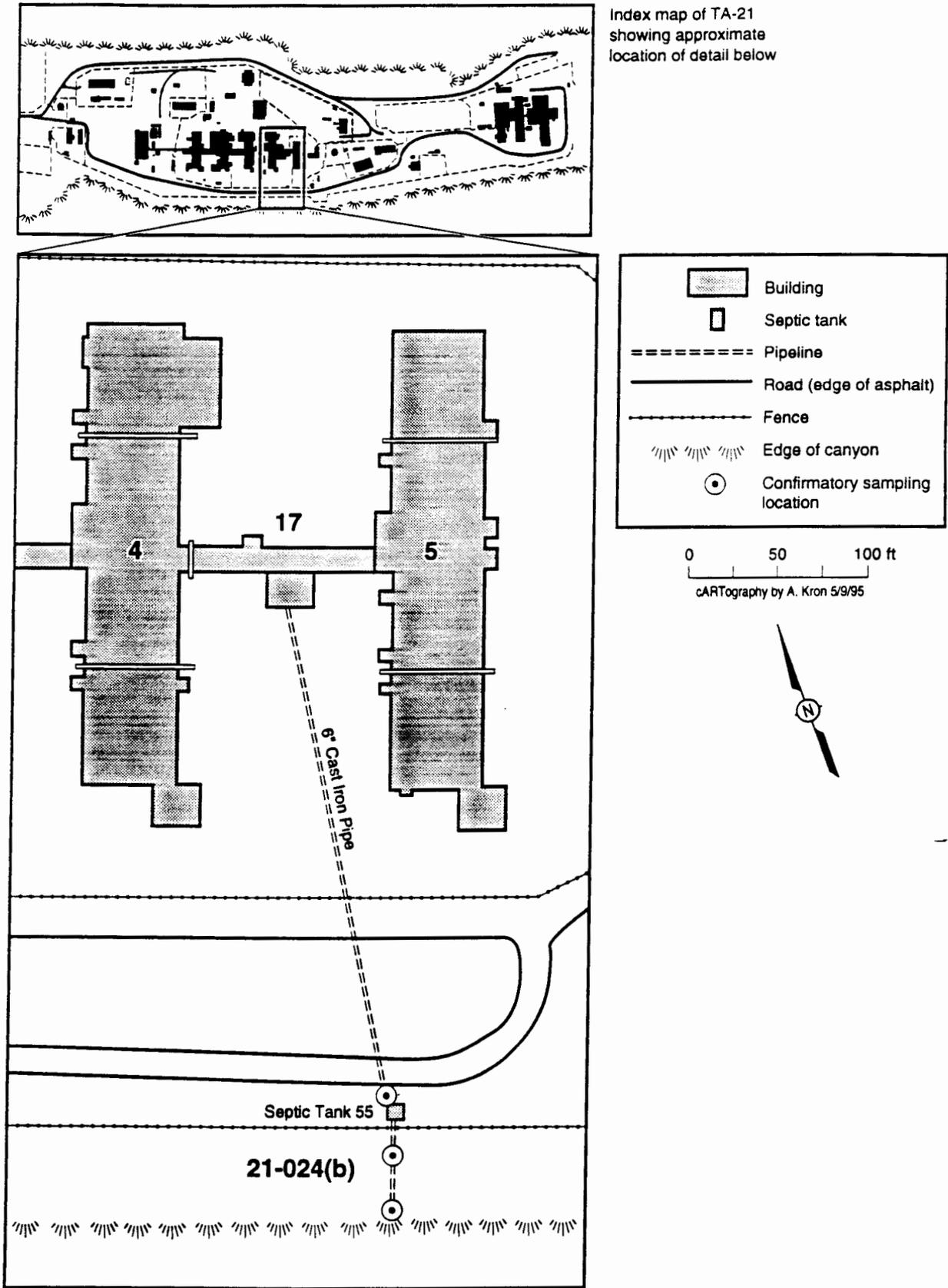
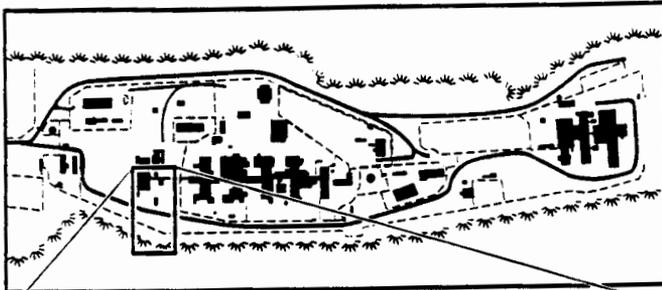
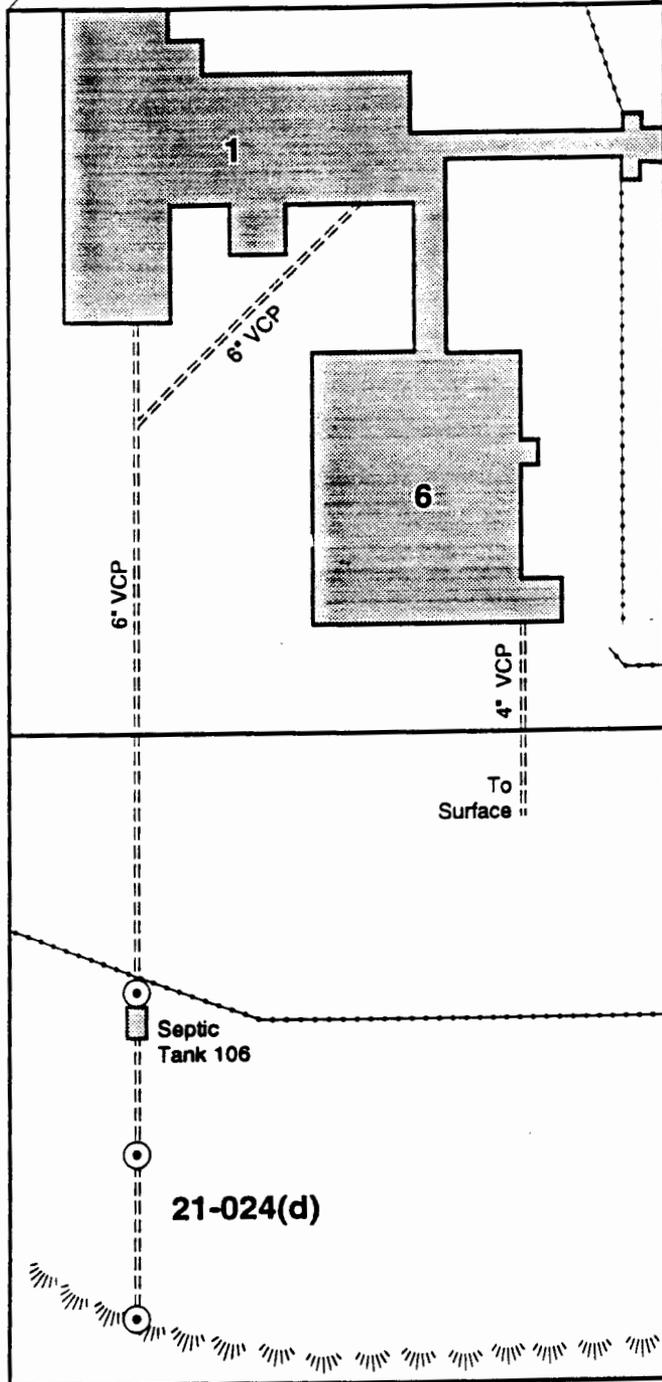


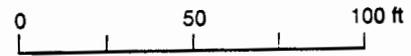
Figure 6.1 Possible confirmatory sampling locations at PRS 21-024(b).



Index map of TA-21 showing approximate location of detail below



	Building
	Septic tank
	Pipeline
	Road (edge of asphalt)
	Fence
	Edge of canyon
	Confirmatory sampling location



cARTography by A. Kron 5/9/95



Figure 6.2 Possible confirmatory sampling locations at PRS 21-024(d).

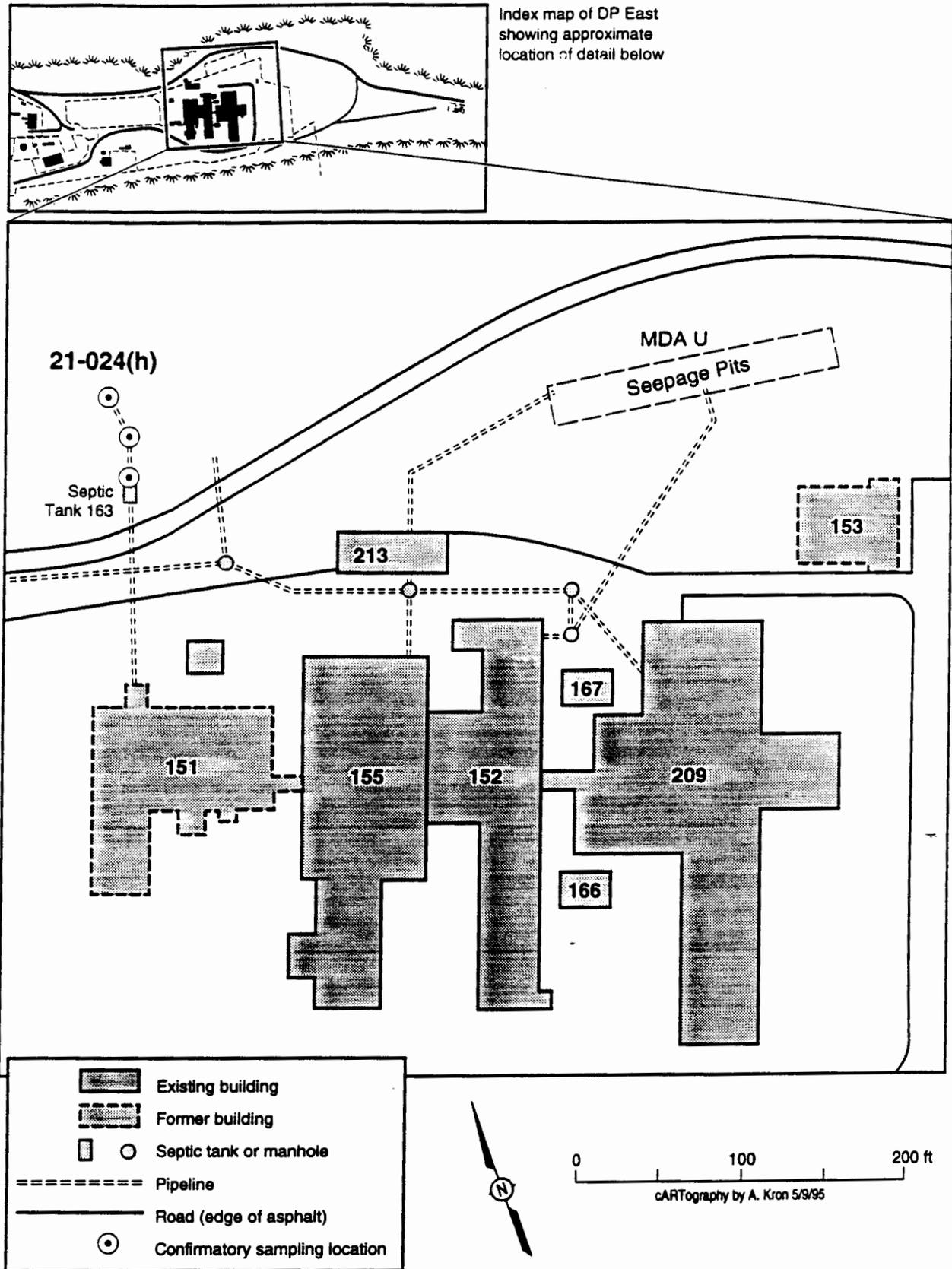


Figure 6.3 Possible confirmatory sampling locations at PRS 21-024(h).