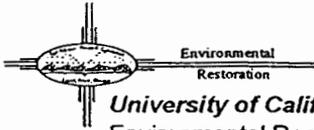


Los Alamos National Laboratory

ENVIRONMENTAL RESTORATION



University of California
Environmental Restoration, 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
Los Alamos, New Mexico 87544
505-665-7203
FAX 505-665-4504



Date: April 19, 1996
Refer to: EM/ER:96-220

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

SUBJECT: FINAL ACCELERATED CLEANUP REPORTS

~~21-024(d)~~
~~21-024(h)~~
21-024(h)

Dear Mr. Garcia:

Enclosed are the final reports and Certifications of Completion for the voluntary corrective actions completed in Fiscal Year 1995. The reports with potential release sites (PRs) listed in the Hazardous and Solid Waste Amendments (HSWA) Module of the Los Alamos National Laboratory's Resource Conservation and Recovery Act operating permit contain our request for no further action (NFA). Upon your approval of these reports, we will submit a permit modification request for NFA of these PRs.

For PRs not listed in the HSWA Module, reports are included as informational copies for your records.

If you have any questions, please call David Bradbury at 505-665-6208.

Thank you for your timely attention to this matter.

Sincerely,

Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,

Theodore Taylor, Program Manager
Los Alamos Area Office

JJ/TT/rfr



10221

12

- Enclosures: (1) Final Reports for HSWA: C-9-001, 6-007(f), 8-005, 16-016(b), 18-001(a), 19-002, 21-013(c), 21-013(d), 21-013(e), 21-024(d), 21-024(e), 21-024(h), 31-001, 33-016, 39-007(a), and 69-001
- (2) Final Reports for non-HSWA: C-0-036(a-d), C-0-041, C-10-001, C-21-027, C-36-001, 0-032, 1-001(f), 3-003(p), 3-022, 3-047(d), 3-051(c), 9-010(a-b), 16-011, 16-016(f), 20-003(c), 21-022(j), 39-002(c), 53-010, and 57-006
- (3) Certifications of Completion

Cy (w/enclosures):

B. Driscoll, EPA, R.6, 6PD-N, (2 copies of HSWA)
D. Griswold, ERD, AL, MS A906
/ J. Harry, EM/ER, MS M992
B. Hoditschek, NMED-HRMB
/ R. Kern, NMED-HRMB
N. Naraine, EM-453, DOE-HQ
M. Shaner, P&PI, MS J591 (5 copies)
N. Weber, Bureau Chief, NMED-AIP, MS J993
J. White, ESH-19, MS K490
S. Yanicak, NMED-AIP, MS J993
RPF, MS M707

Cy (w/o enclosures):

T. Baca, EM, MS J591
D. Bradbury, EM/ER, MS M992
T. Glatzmaier, DDEES/ER, MS M992
D. McInroy, EM/ER, MS M992
G. Rael, ERD, AL, MS A906
W. Spurgeon, EM-453, DOE-HQ
T. Taylor, LAAO, MS A316
J. Vozella, LAAO, MS A316
EM/ER File, MS M992

**Voluntary Corrective
Action Completion
Report for**

**Potential Release Site
21024 (d)
TA-21 Septic Tank**

Field Unit 1

**Environmental
Restoration
Program**

February 1996
Revision 1

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-96-258

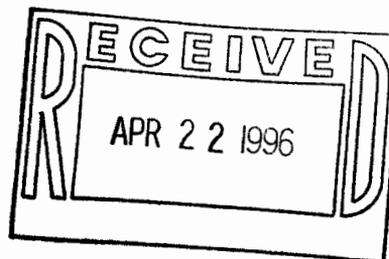
**Voluntary Corrective Action Completion Report
Potential Release Site 21-024(d)
TA-21 Septic Tank**

**Environmental Restoration Project
Field Unit One
Los Alamos National Laboratory**

Revision 1

January 23, 1996

**A Department of Energy
Environmental Cleanup Project**



CERTIFICATION OF COMPLETION

I certify that all the work pertaining to the voluntary corrective action (VCA) at PRS 21-024(d) has been completed in accordance with the Department of Energy approved VCA plan entitled *Voluntary Corrective Action Plan for Potential Release Sites at TA-21 Septic Tanks*. Based on my personal involvement or inquiry of the person or persons who managed this clean up, a review of all data gathered, and a visit to the site, to the best of my knowledge and belief all criteria of the plan have been met or exceeded. I believe that the completion of this VCA is protective to both human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Garry Allen
Field Unit One Project Leader
Environmental Restoration Project
Los Alamos National Laboratory



Date signed

Voluntary Corrective Action Completion Report Potential Release Site 21-024(d) TA-21 Septic Tank

DESCRIPTION

Potential release site (PRS) 21-024(d) is the location of a septic system that routed sewage from Building TA-21-1 (removed in 1965) through a concrete septic tank to the ground surface on the south rim of DP Mesa above Los Alamos Canyon. The outfall of the septic tank terminates at the cliff edge. Results of investigations at this site¹ suggested that the only contaminant present at levels greater than Los Alamos National Laboratory (LANL) screening action levels² was plutonium-239.

PRS 21-024(d) is currently listed in the Hazardous and Solid Waste Amendments (HSWA) module of LANL's Resource Conservation and Recovery Act (RCRA) permit. When results of the RCRA facility investigation (RFI) at this site were reported,¹ LANL proposed to the Environmental Protection Agency (EPA) that no further action be taken for RCRA constituents and corrective action be taken for radioactivity. EPA accepted this proposal and recommended a request for a Class 3 modification to the HSWA module in a notice of deficiency.³

CORRECTIVE ACTION

PRS 21-024(d) at Field Unit 1, TA-21, was selected for voluntary corrective action (VCA). A VCA plan was prepared, and the plan was approved by the Department of Energy (DOE).^{4,5} The VCA was conducted according to the plan with minor deviations (noted below). This report provides the results of the VCA.

VCA activities at this PRS began on July 27 when the septic tank at PRS 21-024(d) was sampled to characterize its contents for waste disposal (Fig. 1). A hand auger was used to obtain one representative sample from the entire 0-to-8-ft depth of the tank; the sample was analyzed for metals (using toxicity characteristic leaching procedures [TCLP]), semivolatile organic compounds, and isotopic plutonium. Three additional samples were collected from the top, middle, and bottom of the tank contents and analyzed for volatile organic compounds. To ensure worker health and safety and to meet the requirements of the fixed analytical laboratory, samples were screened for radiation and volatile compounds using hand-held instruments and mobile laboratory techniques.

On August 22 and 23, the drainage area below the septic tank was surveyed for low-energy gamma radiation.⁶ At 13 locations in the drainage area where an increase in low-energy gamma radiation was identified (Fig. 1), additional field instruments were used to quantify alpha activity (also indicating possible plutonium-239 contamination). To verify field results, five samples from these locations were sent to an off-site laboratory for plutonium-239 analysis.

On September 7, 13, and 14, the solid contents of the septic tank were removed with a backhoe and placed in nine waste containers, resulting in 32 yd³ of solid waste. In addition, the liquid

¹ Phase Report Addendum 1B and 1C: Operable Unit 1106 RCRA Facility Investigation, LA-UR-94-4360, January 1995.

² Action level developed for Environmental Restoration Project screening assessments; for plutonium-239, this level is 18 pCi/g.

³ List of Deficiencies: Operable Unit 1106, RFI Reports 1B, 1C, and Addendum 1B and 1C, March 1995.

⁴ Voluntary Corrective Action Plan for Potential Release Sites at TA-21 Septic Tanks, July 27, 1995.

⁵ Field work approval from Theodore J. Taylor, August 3, 1995.

⁶ Low-energy gamma radiation is emitted by americium-241, which is a daughter of plutonium-241. Plutonium-241 is a contaminant of the plutonium-239 separation process and is commonly used to indicate the presence of plutonium-239.

contents (rain water) were pumped out of the tank into 23 drums, resulting in 1265 gal. of liquid waste. A sample of the liquid was sent to the mobile chemistry laboratory for analysis for semivolatile and volatile organic compounds. The containers and drums were moved to MDA V at TA-21 where they will be stored until they can be disposed of properly as low-level radioactive waste.

Backhoe operations were monitored for radiation and volatile compounds using hand-held instruments. When the tank was empty, a LANL radiation control technician swiped the walls of the tank and detected no removable radioactivity. In accordance with New Mexico regulations for abandoning septic tanks, the inlet and outlet lines were grouted with concrete, the tank was filled with pea gravel, and the area was regraded. On September 15, the surrounding area was reseeded and restored to original condition.

The VCA was completed with the following deviations from the approved VCA plan.

- Samples from the drainage area were sent to a fixed analytical laboratory to verify results obtained with field instruments, which was not required in the plan.
- A sample of the rain water that had collected in the septic tank was sent to a mobile chemistry laboratory to verify the absence of hazardous constituents, which was not required in the plan.

RESULTS

The results of septic tank contents analyses are presented in Table 1; the results of drainage area analyses are presented in Table 2. Copies of all data reports are available and will be provided upon request.

Septic Tank Contents. No semivolatile organic compounds were present at levels greater than the minimum level the analytical method can detect. One volatile organic compound, cis-1,2-dichloroethene, was detected in solid and liquid samples. In one solid sample, the volatile organic compound 1,4-dichlorobenzene was also detected. These compounds would be considered hazardous if they had been discarded as commercial chemical products, off-specification species, container residues, or spill residues thereof; at PRS 21-024(d), however, these criteria do not apply. The only metal detected in the toxicity characteristic leachate, barium, was present at levels less than the toxicity characteristic regulatory level.⁷ These results confirm the absence of RCRA hazardous constituents in the VCA waste.

Plutonium-238 was detected at a level less than the upper tolerance limit⁸ and process area baseline;⁹ plutonium-239 was detected at a level greater than the upper tolerance limit and process area baseline. These results confirmed the presence of radioactivity in the VCA waste. Because the cleanup level¹⁰ for plutonium-239 was not exceeded, however, cleanup actions at the septic tank were limited to abandonment in accordance with New Mexico regulations.

Drainage Area. Results of radiation surveys and field sample analyses indicated that plutonium-239 levels were less than the cleanup level throughout the drainage area, except possibly at sample location 21-4087 (Fig. 1). Results of laboratory analyses on samples from this and other locations confirmed that all samples had plutonium-239 levels less than the cleanup level.

⁷ Level at which a solid waste containing this compound is regulated as a characteristically toxic hazardous waste; documented in 40CFR261.24.

⁸ Limit at the 99th percentile with a 95% confidence level of a range of regional background concentrations; documented in *Statistical Comparisons to Background, Part I*, LA-UR-95-1217, March 28, 1995. Limit at the 95th percentile has not been calculated for plutonium isotopes.

⁹ Comparison value developed from the 95.5% confidence level of ambient analyte concentrations in soil from TA-21 process areas; documented in *Phase Report 1C: TA-21 Operable Unit RCRA Facility Investigation*, LA-UR-94-228, February 28, 1994.

¹⁰ Decontamination and Decommissioning Program cleanup level determined using RESRAD, Version 5.191, Code for Calculating Residual Radioactivity in Soil for a 100 mrem/yr dose to a resident farmer.

Because the cleanup level for plutonium-239 was not exceeded, no cleanup actions were taken in the drainage area.

CONCLUSIONS

This PRS can be removed from the HSWA module, as recommended by the EPA.³ The VCA addressed the radioactive contents of the septic tank and resulted in tank abandonment according to New Mexico regulations. This report serves as the formal request for DOE concurrence that PRS 21-024(d) need no longer be considered a discrete PRS for radiological issues, PRS 21-024(d) may be dropped from the list of Environmental Restoration Project PRSs, and no additional corrective action is necessary at PRS 21-024(d).

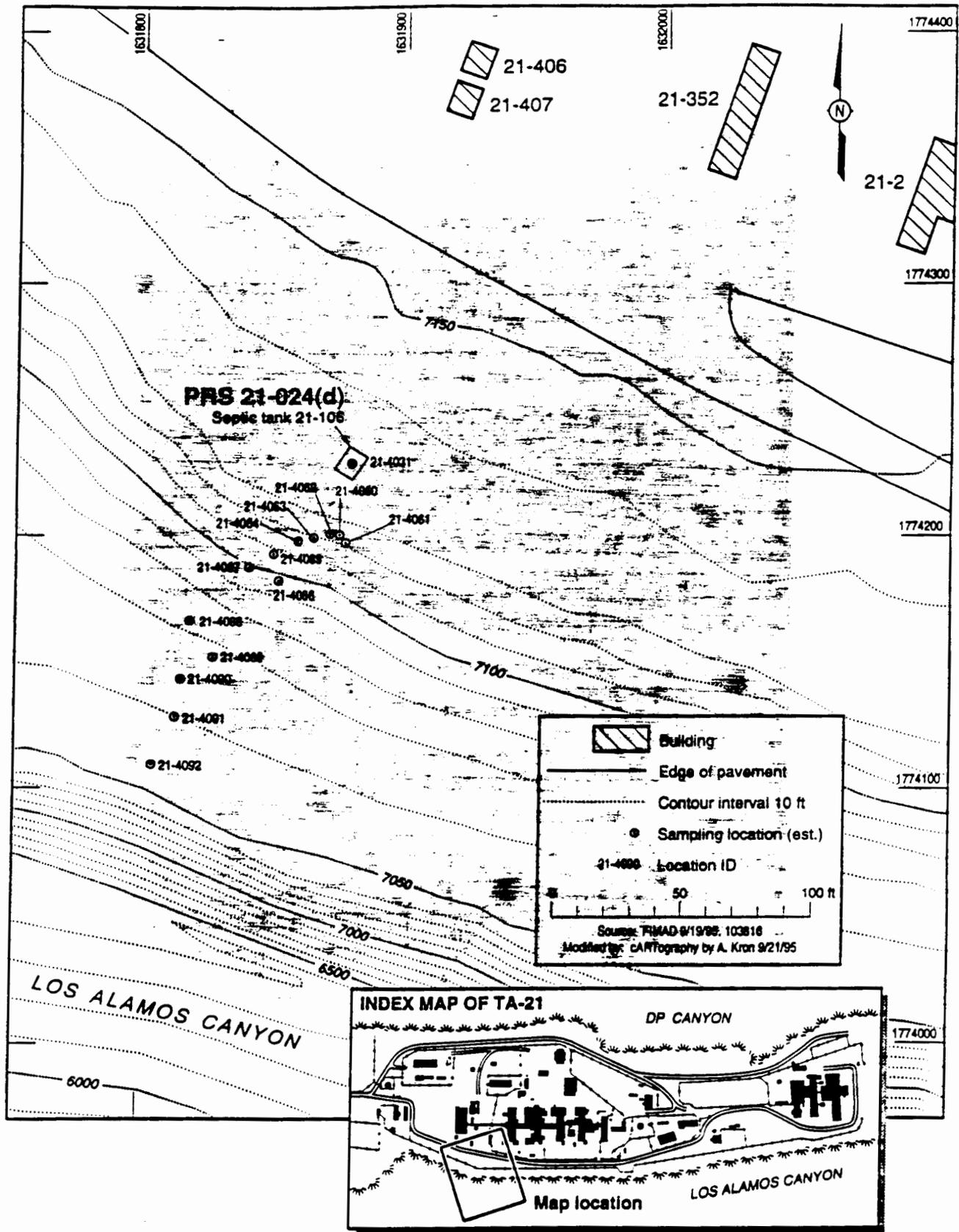


Fig. 1. Location of Samples Collected at PRS 21-024(d)

Table 1. Results of Septic Tank Contents Analyses for Waste Characterization at PRS 21-024(d)

Comparison Value	Radionuclides		Metals ^a	Volatile Organic Compounds ^b	
	²³⁸ Pu (pCi/g)	²³⁹ Pu (pCi/g)	Ba (µg/L)	cis-1,2-dichloroethene (µg/kg)	1,4-dichlorobenzene (µg/kg)
Upper tolerance limit ^c	0.014	0.052	NC ^d	NC ^d	NC ^d
Process area baseline ^e	6.21	9.41	NC ^d	NC ^d	NC ^d
Toxicity characteristic regulatory level ^f	NC ^d	NC ^d	100,000	NC ^d	NC ^d

Location ID	Sample ID	Depth (ft)	Radionuclides		Metals ^a	Volatile Organic Compounds ^b	
			²³⁸ Pu (pCi/g)	²³⁹ Pu (pCi/g)	Ba (µg/L)	cis-1,2-dichloroethene (µg/kg)	1,4-dichlorobenzene (µg/kg)
21-4031	121-95-0311	0-2.5	NA ^g	NA ^g	NA ^g	13 - 16	ND ^h
21-4031	121-95-0312	2.5-5.0	NA ^g	NA ^g	NA ^g	21 - 37	ND ^h
21-4031	121-95-0313	5.0-8.0	NA ^g	NA ^g	NA ^g	17 - 24	64 - 130
21-4031	121-95-0314	0-8.0	0.01	11.6	1480	NA ^g	NA ^g
21-4031	121-95-0317	water ⁱ	NA ^g	NA ^g	NA ^g	65 ^j	ND ^h

a Analyzed using toxicity characteristic leaching procedures (TCLP)

b No semivolatile organic compounds present at levels greater than method detection limits

c Limit at the 99th percentile with a 95% confidence level of a range of regional background concentrations; limit at the 95th percentile has not been calculated for plutonium isotopes

d Not calculated in comparable units

e Comparison value developed from the 95.5% confidence level of ambient analyte concentrations in soil from TA-21 process areas

f Level at which a solid waste containing this compound is regulated as a characteristically toxic hazardous waste

g Not analyzed

h Not detected

i Sample of rain water that had collected in septic tank

j Units are µg/L

Table 2. Results of Drainage Area Analyses at PRS 21-024(d)

Comparison Value	²³⁹ Pu (pCi/g)
Upper tolerance limit ^a	0.052
Process area baseline ^b	9.41
Screening action level ^c	18
Cleanup level ^d	75

Location ID	Sample ID	Depth (in.)	Field Analysis	Lab Analysis
			Estimated ²³⁹ Pu (pCi/g)	²³⁹ Pu (pCi/g)
21-4060	121-95-0372	0-6	< 1	NA ^e
21-4061	121-95-0373	0-6	< 1	NA ^e
21-4061	121-95-0374	6-12	1	NA ^e
21-4061	121-95-0375	12-18	4	NA ^e
21-4062	121-95-0376	0-6	21	NA ^e
21-4062	121-95-0377	6-12	17	NA ^e
21-4063	121-95-0378	0-6	22	23.2
21-4063	121-95-0379	6-12	48	NA ^e
21-4064	121-95-0380	0-6	5	NA ^e
21-4085	121-95-0407	0-6	19	NA ^e
21-4086	121-95-0408	0-6	59	51.5
21-4087	121-95-0409	0-6	77	66.9
21-4088	121-95-0410	0-6	< 1	NA ^e
21-4089	121-95-0411	0-6	< 1	NA ^e
21-4090	121-95-0412	0-6	< 1	3.83
21-4090	121-95-0413	6-12	< 1	NA ^e
21-4091	121-95-0414	0-6	7	NA ^e
21-4092	121-95-0415	0-6	39	17.5

- a Limit at the 99th percentile with a 95% confidence level of a range of regional background concentrations; limit at the 95th percentile has not been calculated for plutonium isotopes
- b Comparison value developed from the 95.5% confidence level of ambient analyte concentrations in soil from TA-21 process areas
- c Action level developed for Environmental Restoration Project screening assessments
- d Decontamination and Decommissioning Program cleanup level determined using RESRAD, Version 5.191, Code for Calculating Residual Radioactivity in Soil for a 100 mrem/yr dose to a resident farmer
- e Not analyzed

001

5056654632:# 2

LOS ALAMOS
AREA OFFICE
(LAAO)

DOCUMENT REVIEW/RESPONSE

DOC TITLE: Final Reports and Cert. Of Completion for VCA's (TA-21 review)

LANL CST-18 BR

ENV. & PROJECTS-

1-2-98 : 4:48PM :

5056654632

01/03/96 17:32

SENT BY: DEPT. OF ENERGY

ITEM #	PAGE, SECTION #, OR DRAWING #.	COMMENTS	RESPONSE
1	Page 2 & 4	<p>PRS C-21-027, COOLING TOWER</p> <p>As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?</p>	
2	Page 1 & 4	<p>PRS 21-023(j), SUMP</p> <p>Was the sump located in building 21-3 as stated in the text on page 1, or in building 21-4 as shown in the figure on page 4?</p>	
3	Page 2 & 5	<p>As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?</p>	
4	Page 5	<p>For footnote "f" add the version of RESRAD used (5.191).</p>	
5	Page 2 & 5	<p>PRS 21-024(d), SEPTIC SYSTEM AND OUTFALL</p> <p>As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?</p>	<p>This limit has not been calculated for plutonium isotopes. Footnote 8 on page 2; footnote c, Table 1, on page 5; and footnote a, Table 2, on page 6 have been revised to provide this information.</p>
6	Page 2 & 6	<p>For footnotes referencing RESRAD calculations by D&D, add the RESRAD version 5.191.</p>	<p>Footnote 10 on page 2 and footnoted, Table 2, on page 6 have been revised.</p>

REVIEWED BY: Joseph Mont. DOE/LAAO. (505667-5008)

DATE: 11/21/95

REVIEWED BY:

DATE:

LOS ALAMOS
 AREA OFFICE
 (LAAO)

DOCUMENT REVIEW/RESPONSE
 DOC TITLE: Final Reports and Cert. Of Completion for VCA's (TA-21 review)

ITEM #	PAGE, SECTION #, OR DRAWING #.	COMMENTS	RESPONSE
7	Page 2 & 5	FRS 21-024(e), SEPTIC SYSTEM AND OUTFALL. As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?	
8	Page 2 & 5	For footnotes referencing RBSRAD calculations by D&D, add the RBSRAD version 5.191.	
9	Page 2	Footnotes 10 and 11 are the same, delete 11 and change reference in text.	
10	Page 2 & 6	FRS 21-024(b), SEPTIC SYSTEM AND OUTFALL. As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?	
11	Page 2 & 6	For footnotes referencing RBSRAD calculations by D&D, add the RBSRAD version 5.191.	

REVIEWED BY: Joseph Moe, DOE/LAAO, G80667-SM8

DATE: 11/21/95

REVIEWED BY:

DATE:

**Voluntary Corrective
Action Completion
Report for**

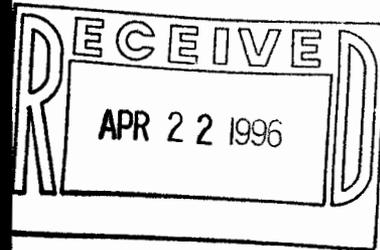
**Potential Release Site
21-024(h)
TA-21 Septic Tank**

Field Unit 1

**Environmental
Restoration
Program**

February 1996
Revision 1

A Department of Energy
Environmental Cleanup Program



Los Alamos
NATIONAL LABORATORY

LA-UR-96-256

**Voluntary Corrective Action Completion Report
Potential Release Site 21-024(h)
TA-21 Septic Tank**

**Environmental Restoration Project
Field Unit One
Los Alamos National Laboratory**

Revision 1

January 23, 1996

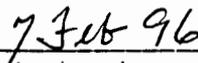
**A Department of Energy
Environmental Cleanup Project**

CERTIFICATION OF COMPLETION

I certify that all the work pertaining to the voluntary corrective action (VCA) at PRS 21-024(h) has been completed in accordance with the Department of Energy approved VCA plan entitled *Voluntary Corrective Action Plan for Potential Release Sites at TA-21 Septic Tanks*. Based on my personal involvement or inquiry of the person or persons who managed this clean up, a review of all data gathered, and a visit to the site, to the best of my knowledge and belief all criteria of the plan have been met or exceeded. I believe that the completion of this VCA is protective to both human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Garry Allen
Field Unit One Project Leader
Environmental Restoration Project
Los Alamos National Laboratory



Date signed

Voluntary Corrective Action Completion Report

Potential Release Site 21-024(h)

TA-21 Septic Tank

DESCRIPTION

Potential release site (PRS) 21-024(h) is the location of a septic system that routed 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. Results of investigations at this site¹ suggested that the only contaminant present at levels greater than Los Alamos National Laboratory (LANL) screening action levels² was plutonium-239.

PRS 21-024(h) is currently listed in the Hazardous and Solid Waste Amendments (HSWA) module of LANL's Resource Conservation and Recovery Act (RCRA) permit. When results of the RCRA facility investigation (RFI) at this site were reported,¹ LANL proposed to the Environmental Protection Agency (EPA) that no further action be taken for RCRA constituents and risk assessment be performed for radioactivity. In a notice of deficiency,³ EPA requested additional information on organic contamination found in laboratory blanks, which LANL provided in its response to the notice. It is expected that EPA will recommend a request for a Class 3 modification to the HSWA module.

CORRECTIVE ACTION

PRS 21-024(h) at Field Unit 1, TA-21, was selected for voluntary corrective action (VCA). A VCA plan was prepared, and the plan was approved by the Department of Energy (DOE).^{4,5} The VCA was conducted according to the plan with minor deviations (noted below). This report provides the results of the VCA.

VCA activities at this PRS began on July 27 when the septic tank at PRS 21-024(h) was sampled to characterize its contents for waste disposal (Fig. 1). A hand auger was used to obtain one representative sample from the entire 0-to-8-ft depth of the tank; the sample was analyzed for metals (using toxicity characteristic leaching procedures [TCLP]), semivolatile organic compounds, and isotopic plutonium. Two additional samples were collected from the top and middle of the tank contents and analyzed for volatile organic compounds (a third planned sample, from the bottom of the tank contents, was inadvertently omitted). To ensure worker health and safety and to meet the requirements of the fixed analytical laboratory, samples were screened for radiation and volatile compounds using hand-held instruments and mobile laboratory techniques.

On August 21 and 22, the drainage area below the septic tank was surveyed for low-energy gamma radiation.⁶ At four locations in the drainage area where an increase in low-energy gamma radiation was identified (Fig. 1), additional field instruments were used to quantify alpha activity (also indicating possible plutonium-239 contamination).

On September 6 and 7, the contents of the septic tank were removed with a backhoe and placed in five waste containers, resulting in approximately 18 yd³ of solid waste. The containers were

¹ Phase Report Addendum 1B and 1C: Operable Unit 1106 RCRA Facility Investigation, LA-UR-94-4360, January 1995.

² Action level developed for Environmental Restoration Project screening assessments.

³ List of Deficiencies: Operable Unit 1106, RFI Reports 1B, 1C, and Addendum 1B and 1C, March 1995.

⁴ Voluntary Corrective Action Plan for Potential Release Sites at TA-21 Septic Tanks, July 27, 1995.

⁵ Field work approval from Theodore J. Taylor, August 3, 1995.

⁶ Low-energy gamma radiation is emitted by americium-241, which is a daughter of plutonium-241. Plutonium-241 is a contaminant of the plutonium-239 separation process and is commonly used to indicate the presence of plutonium-239.

moved to MDA V at TA-21 where they will be stored until they can be disposed of properly. Backhoe operations were monitored for radiation and volatile compounds using hand-held instruments.

During backhoe operations, field instruments detected organic vapors emanating from the bottom layer of the septic tank contents, and a sample was collected and sent to the mobile chemistry laboratory for analysis for volatile organic compounds. When the tank was empty, a LANL radiation control technician swiped the walls of the tank and detected no removable radioactivity.

In accordance with New Mexico regulations for abandoning septic tanks, the inlet and outlet lines were grouted with concrete, the tank was filled with pea gravel, and the area was regraded.

The VCA was completed with the following deviations from the approved VCA plan.

- No waste characterization sample was collected from the 5-to-8-ft depth of the septic tank. The sample container was labeled but empty when the analytical laboratory received it. According to the plan, this sample should have been collected and analyzed for volatile organic compounds.
- During backhoe operations, a sample was collected from the 5-to-8-ft depth of the septic tank and analyzed for volatile organic compounds, which was not required in the plan during backhoe operations.

RESULTS

The results of septic tank contents analyses are presented in Tables 1 and 2; the results of drainage area analyses are presented in Table 3. Copies of all data reports are available and will be provided upon request.

Septic Tank Contents. No semivolatile organic compounds were present at levels greater than the minimum level the analytical method can detect. Several volatile organic compounds were detected:

- trichloroethene and its anaerobic degradation products, cis-1,2-dichloroethene and trans-1,2-dichloroethene, which potentially represent a hazardous (F-listed) solvent;
- 1,1,1-trichloroethane and its anaerobic degradation products, 1,1-dichloroethane and 1,2-dichloroethane, which potentially represent a hazardous (F-listed) solvent;
- benzene, toluene, ethylbenzene, and xylenes, which are characteristic components of gasoline; and
- 1,3-dichlorobenzene, which is typically used as a fumigant and insecticide. This compound would be considered hazardous if it had been discarded as a commercial chemical product, off-specification species, container residue, or spill residue thereof. At PRS 21-024(h), however, these criteria do not apply; thus this compound does not represent a hazardous constituent.

The only metal detected in sample toxicity characteristic leachate, barium, was present at levels less than the toxicity characteristic regulatory level.⁷ These results suggest the presence of hazardous constituents in the VCA waste; however, further waste characterization is required.

Plutonium-238 and plutonium-239 were detected at levels less than the process area baseline⁸ but greater than the upper tolerance limit.⁹ These results suggest the presence of radioactivity in the VCA waste and the possibility that a portion of the excavated tank contents may be

⁷ Level at which a solid waste containing this compound is regulated as toxic and therefore hazardous.

⁸ Companion value developed from the 95.5% confidence level of ambient analyte concentrations in soil from TA-21 process areas; documented in *Phase Report 1C: TA-21 Operable Unit RCRA Facility Investigation*, LA-UR-94-228, February 28, 1994.

⁹ Limit at the 99th percentile with a 95% confidence level of a range of regional background concentrations; documented in *Statistical Comparisons to Background, Part I*, LA-UR-95-1217, March 28, 1995. Limit at the 95th percentile has not been calculated for plutonium isotopes.

considered mixed waste. Further waste characterization is required. Because the cleanup level¹⁰ was not exceeded, cleanup actions at the septic tank were limited to abandonment in accordance with New Mexico regulations.

Drainage Area Samples. During the 1993 RFI, no organic compounds were detected in the drainage area. During the VCA, results of radiation surveys, field analyses, and field sample analyses indicated that plutonium-239 levels were less than the cleanup level throughout the drainage area, and in most locations, less than the process area baseline and screening action level. Because the cleanup level was not exceeded, no cleanup actions were taken in the drainage area.

CONCLUSIONS

This PRS can be removed from the HSWA module, since the request for information on organic contamination in laboratory blanks was fulfilled in LANL's response to EPA's notice of deficiency.³ The VCA addressed radioactive contamination in the septic tank and drainage area and resulted in tank abandonment according to New Mexico regulations. Further investigation is required to determine how the VCA waste will be disposed of. This report serves as the formal request for DOE concurrence that PRS 21-024(h) need no longer be considered a discrete PRS for radiological issues, PRS 21-024(h) may be dropped from the list of Environmental Restoration Project PRSs, and no risk assessment for radioactivity is necessary at PRS 21-024(h).

¹⁰ Decontamination and Decommissioning Program cleanup level determined using RESRAD, Version 5.191, Code for Calculating Residual Radioactivity in Soil for a 100 mrem/yr dose to a resident farmer.

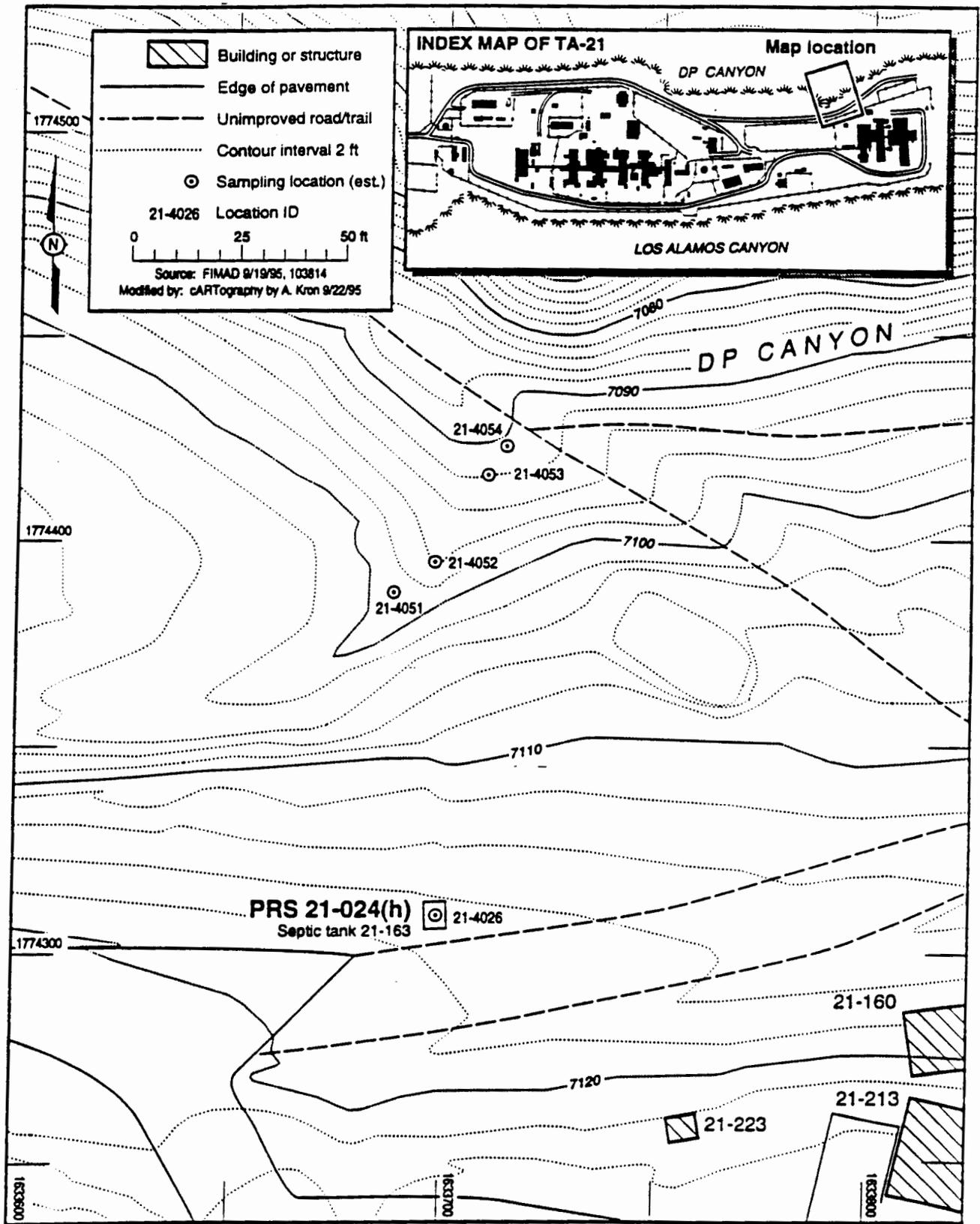


Fig. 1. Location of Samples Collected at PRS 21-024(h)

Table 1. Results of Organic Compounds Analyses of Septic Tank Contents for Waste Characterization at PRS 21-024(h)

Loc. ID	Sample ID	Depth (ft)	Semivolatile Organic Compounds	Volatile Organic Compounds ^a												
				trichloro-ethene (µg/kg)	cis-1,2-dichloro-ethene (µg/kg)	trans-1,2-dichloro-ethene (µg/kg)	1,1,1-trichloro-ethane (µg/kg)	1,1-dichloro-ethane (µg/kg)	1,2-dichloro-ethane (µg/kg)	benzene (µg/kg)	toluene (µg/kg)	ethyl-benzene (µg/kg)	m,p-xylene (µg/kg)	o-xylene (µg/kg)	1,3-dichloro-benzene (µg/kg)	
21-4026	121-95-0301 ^b	0-2.5	NA ^c	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d
21-4026	121-95-0302 ^b	2.5-5.0	NA ^c	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d	ND ^d
21-4026	121-95-0451 ^e	5.0-8.0	NA ^c	140 160	2400 2800	25 26	25 33	140 170	2 ^f ND ^d	17 23	31 49	4 ^f 2 ^f	13 ND ^d	11 16	11,000 18,000	
21-4026	121-95-0304 ^b	0-8.0	ND ^d	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c	NA ^c

a Each sample analyzed twice

b Sample analyzed at off-site laboratory

c Not analyzed

d Not detected

e Sample analyzed at mobile chemistry laboratory

f Estimated quantity

Table 2. Results of Radionuclides and Metals Analyses of Septic Tank Contents for Waste Characterization at PRS 21-024(h)

Comparison Value	Radionuclides		Metals ^a
	²³⁸ Pu (pCi/g)	²³⁹ Pu (pCi/g)	Ba (µg/L)
Upper tolerance limit ^b	0.014	0.052	NC ^c
Process area baseline ^d	6.21	9.41	NC ^c
Toxicity characteristic regulatory level ^e	NC ^c	NC ^c	100,000

Location ID	Sample ID	Depth (ft)	Radionuclides ^f		Metals ^a
			²³⁸ Pu (pCi/g)	²³⁹ Pu (pCi/g)	Ba (µg/L)
21-4026	121-95-0301	0-2.5	NA ^g	NA ^g	NA ^g
21-4026	121-95-0302	2.5-5.0	NA ^g	NA ^g	NA ^g
21-4026	121-95-0451	5.0-8.0	NA ^g	NA ^g	NA ^g
21-4026	121-95-0304	0-8.0	ND ^h , 0.061 ^f	0.43 ^f , 0.61 ^f	672

- a Analyzed using toxicity characteristic leaching procedures (TCLP)
 b Limit at the 99th percentile with a 95% confidence level of a range of regional background concentrations; limit at the 95th percentile has not been calculated for plutonium isotopes
 c Not calculated in comparable units
 d Comparison value developed from the 95.5% confidence level of ambient analyte concentrations in soil from TA-21 process areas
 e Level at which a solid waste containing this compound is regulated as a characteristically toxic hazardous waste
 f Each sample analyzed twice
 g Not analyzed
 h Not detected

Table 3. Results of Drainage Area Analyses at PRS 21-024(h)

Comparison Value	²³⁸ Pu (pCi/g)
Upper tolerance limit ^a	0.052
Process area baseline ^b	9.41
Screening action level ^c	18
Cleanup level ^d	75

Location ID	Sample ID	Depth (in.)	Field Analysis
			Estimated ²³⁸ Pu (pCi/g)
21-4051	121-95-0351	0-6	< 1
21-4051	121-95-0352	6-12	< 1
21-4051	121-95-0353	12-18	< 1
21-4052	121-95-0354	0-6	< 1
21-4052	121-95-0355	6-12	< 1
21-4052	121-95-0356	12-18	10
21-4053	121-95-0357	0-6	< 1
21-4053	121-95-0358	6-12	< 1
21-4053	121-95-0359	12-18	9
21-4054	121-95-0360	0-6	< 1
21-4054	121-95-0361	6-12	5

- a Limit at the 99th percentile with a 95% confidence level of a range of regional background concentrations; limit at the 95th percentile has not been calculated for plutonium isotopes
 b Comparison value developed from the 95.5% confidence level of ambient analyte concentrations in soil from TA-21 process areas
 c Action level developed for Environmental Restoration Project screening assessments
 d Decontamination and Decommissioning Program cleanup level determined using RESRAD, Version 5.191, Code for Calculating Residual Radioactivity in Soil for a 100 mrem/yr dose to a resident farmer

ITEM #	PAGE, SECTION #, OR DRAWING #.	COMMENTS	RESPONSE
7	Page 2 & 5	<p>FRS 21-024(e), SEPTIC SYSTEM AND OUTFALL</p> <p>As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?</p>	
8	Page 2 & 5	<p>For footnotes referencing RESRAD calculations by D&D, add the RESRAD version 5.191.</p>	
9	Page 2	<p>Footnotes 10 and 11 are the same, delete 11 and change reference in text.</p>	
10	Page 2 & 6	<p>FRS 21-024(h), SEPTIC SYSTEM AND OUTFALL</p> <p>As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?</p>	
11	Page 2 & 6	<p>For footnotes referencing RESRAD calculations by D&D, add the RESRAD version 5.191.</p>	<p>This limit has not been calculated for plutonium isotopes. Footnote 9 on page 2; footnote b, Table 2, on page 6; and footnote a, Table 3, on page 6 have been revised to provide this information.</p>
			<p>Footnote 10 on page 2 and footnote d, Table 3, on page 6 have been revised.</p>

REVIEWED BY: Joseph Mose, DOE/LAAO, (505)667-5808

DATE: 11/21/95

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LOS ALAMOS
AREA OFFICE
(LAAO)

DOCUMENT REVIEW/RESPONSE
DOC TITLE: Final Reports and Cert. Of Completion for VCA's (TA-21 review)

Page 1 of 2

ITEM #	PAGE, SECTION #, OR DRAWING #.	COMMENTS	RESPONSE
1	Page 2 & 4	<p>PRS C-21-027, COOLING TOWER</p> <p>As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?</p>	
2	Page 1 & 4	<p>PRS 21-022(j), SUMP</p> <p>Was the sump located in building 21-3 as stated in the text on page 1, or in building 21-4 as shown in the figure on page 4?</p>	
3	Page 2 & 5	<p>As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?</p>	
4	Page 5	<p>For footnote "f" add the version of RESRAD used (5.191).</p> <p>PRS 21-024(d), SEPTIC SYSTEM AND OUTFALL</p>	
5	Page 2 & 5	<p>As per EPA, shouldn't the UTL's be calculated based on the 95th percentile with a 95% confidence level of a range of regional background concentrations?</p>	
6	Page 2 & 6	<p>For footnotes referencing RESRAD calculations by D&D, add the RESRAD version 5.191.</p>	

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