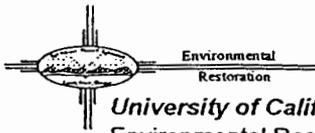


# Los Alamos National Laboratory

ENVIRONMENTAL RESTORATION



**University of California**  
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**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** 21-013(c)  
21-013(d)  
21-013(e)  
31-001

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.

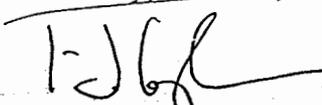
If you have any questions, please call David Bradbury at 505-665-6208.

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



10222

- 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 Sites**

**21-013(c)**

**21-013(d)**

**21-013(e)**

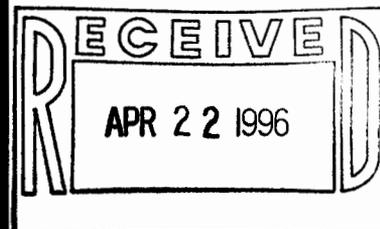
**31-001**

**Field Unit 1**

**Environmental  
Restoration  
Project**

**February 26, 1996  
Revision 1**

**A Department of Energy  
Environmental Cleanup Project**



**Los Alamos**  
NATIONAL LABORATORY

LA-UR-96-259

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- B. RFI Sampling Results for PRS 21-013(d)
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**FINAL REPORT**

**Voluntary Corrective Action Completion Report  
Potential Release Site 21-013(c)  
Surface Disposal Area**

**Environmental Restoration Project  
Field Unit 1  
Los Alamos National Laboratory**

**February 26, 1996**

**A Department of Energy  
Environmental Cleanup Project**

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**Voluntary Corrective Action Completion Report  
Potential Release Site 21-013(c),  
Surface Disposal Area**

**DESCRIPTION**

Potential Release Site (PRS) 21-013(c) is located in an unsecured area within Los Alamos National Laboratory's (Laboratory) Technical Area (TA) 21, and is accessible from DP Road off State Highway 502 via an unpaved road. The site boundaries are defined to the north by a dirt road leading to the sanitary treatment plant, to the south by a line extending eastward from the southeast corner of the asphalt parking lot for TA-21-209, to the west by the TA-21-209 parking lot fences, and to the east by the eastern limit of an excavated trench. Prior to the voluntary corrective action (VCA), the site consisted of mounds of earth, an excavated trench, and an earthen berm that contained scattered concrete, asphalt and metal debris. Four large concrete pylons and several piles of soil, asphalt, and concrete were also located on the site. Other surface debris included scrap metal and wood, cans, paper, glass, and plastic. Because radiological contamination is a general characteristic of TA-21, any materials to be removed from the area are assumed to be low-level waste pending confirmation.

The PRS had been disturbed in the past and appeared to contain only building materials. It is not known when materials were disposed of at this site. The site is included in the Hazardous and Solid Waste Amendments (HSWA) Module of the Laboratory's Resource Conservation and Recovery Act Permit, EPA I.D. NM0890010515.

**RFI HISTORY**

RCRA Facilities Investigation (RFI) field work was conducted in September and October, 1994. The RFI work plan called for a three-section by three-section grid to be laid out across the area where debris was disposed of. The size of the grid sections was not specified in the work plan; however the grid layout was to be based on the figure in the work plan (Figure 14.7-2, TA-21 Operable Unit RFI Work Plan for ER, May 1991) and on visual inspection of the site. The grid sections were to be of approximately equal dimensions.

Radiation surveys were to be performed in the grid area to identify elevated radiation levels. Samples were to be collected at the centers of the grid sections and at areas where radiation levels were elevated. The sampling intervals were to be 0-to-6 in, 0-to-2.5 ft, 2.5-to-5.0 ft, and 5.0-to-7.5 ft. Each location sampled was to generate a total of four samples. Because the purpose of these investigations was to confirm either the presence or the absence of contamination, the work plan specified that 25% of the 0-

to-6 in interval samples and 25% of the deeper samples be sent to off-site laboratories for analyses. Samples were to be selected for off-site analyses and were to include samples with elevated levels of radiation or volatile organic compounds.

The phase I RFI began with a site visit to determine where the sampling grid was to be laid out. The debris piles were scattered; therefore, a three-section by three-section square grid would have resulted in very large grid sections, many of which would not contain debris. A decision was made to lay out 10 grid sections in an irregular pattern as shown in Figure 1, Phase I RFI Sampling Plan at PRS 21-013(c). This grid covered the area of interest more efficiently than the grid illustrated in the work plan and met the minimum number of sections and sampling points called for in the work plan. These grid sections were 20-m by 20-m, and grid lines were oriented north-south and east-west. The souther-most grid section (number 10) was added to include a small debris pile that was located away from the main body of piles.

The radiation survey was performed using alpha, beta/gamma, and low-energy gamma radiation detection instruments. Detected radiation levels were consistent with the local TA-21 background radiation levels. Therefore, no additional sampling locations were identified, based on elevated radiation levels.

Surface and subsurface samples were collected from the centers of each of 10 grid sections. The 0-6 in sample was collected using a spade or scoop method and the deeper samples were collected using a small, hollow-stem auger drill rig with a split-spoon sampler.

All the samples were field screened for alpha and beta/gamma radiation for worker health and safety and delivered to a mobil radiation laboratory for further radiation screening. In addition, all samples collected were screened for volatile organic compounds using an organic vapor monitor to check the head space of a closed container of soil or tuff from each sampling interval.

A total of 40 samples were collected during this investigation from ten locations. All ten of the 0-to-6 in samples were shipped to an off-site analytical laboratory for a full suite of analyses because of a concern that elevated alpha radiation screening results from the radiation survey indicated possible airborne radioactive contamination from the nearby former filter building TA-21-153 that served facilities at DP East. The 0-to-2.5 ft, 2.5-to-5.0 ft, and 5.0-to-7.5 ft samples were stored in refrigerators until analytical results from the mobile radiation laboratory could be assessed, usually within 24 hours of sample collection. A problem was noted with the mobile radiation laboratory's alpha detection instrument so the results of the field alpha radiation screening were substituted. The assessment of the field and mobile radiation screening results of the deeper samples indicated that there was no significant change in radiation levels from the 0-to-2.5 ft, 2.5-to-5.0 ft, and 5.0-to-7.5 ft intervals. All ten of the 0-to-2.5 ft interval samples were shipped to an off-site analytical laboratory for a full suite of analyses, instead of the reduced number specified in the workplan because of this PRS's proximity to filter building TA-21-153.

All sampling work is complete. Four organic chemicals (benzo[a]anthracene, benzo[b]fluoranthene, benzo[a]pyrene, and pentachlorophenol) and 2 radionuclides (thorium-228, and radium-224) were identified as chemicals of potential concern (COPCs) (i.e., chemicals whose maximum concentrations are greater than their screening action levels [SALs]). No additional COPCs were identified in the multiple chemical evaluation (MCE). See Appendix A for the RFI sampling results along with the MCE.

Thorium-228 and radium-224 are daughter products of thorium-232 and are difficult to detect with gamma spectroscopy. Because of the large uncertainty associated with these samples, the sample values are considered to fall within background levels. In addition, field screening of the site prior to remediation indicated that radioactivity at the site was not significantly elevated above background. In addition, the calculated 95% upper confidence levels (UCL) of the mean concentrations of the RFI data for the organic chemicals were below their respective preliminary remedial goals (PRGs). A multiple chemical evaluation (MCE) of the organic COPCs using PRG comparison ratios (95% UCL mean/PRG) indicated that the total contribution to potential risk was below the target value of  $1 \times 10^{-6}$ . Attachment 1 to Appendix A presents the comparison of the 95% UCLs of the mean for the organic chemicals with their respective PRGs, along with a presentation of the multiple chemical PRG analysis using RFI data. Appendix F in the approved VCA plan for this PRS provides a discussion of the multiple chemical PRG analysis and is provided in Attachment 2 to Appendix A in this report.

Because there were no COPCs driving the cleanup at this site, a VCA was deemed appropriate to remove the surface debris. RFI data was collected prior to remediation, and did not include the areas beneath the waste piles (the focus of the VCA effort).

This VCA Completion Report is submitted in lieu of the RFI Report.

## **CORRECTIVE ACTION**

The cleanup followed the approved VCA Plan, with the following deviations: a modified confirmatory sampling plan was implemented, which added analyses for target analyte list (TAL) metals and eliminated toxicity characteristic leaching procedure (TCLP) metals. The TAL metal analysis was added to the confirmatory sampling to identify any potential contamination by total metals. The waste characterization sampling was modified to add laboratory analyses of the wood, concrete, and asphalt debris. The waste characterization sampling was modified to eliminate analysis for TCLP metals and add analysis for TAL metals because high levels of metals were not expected to be present based on previous sampling. In addition, reactive cyanide, high explosive compound, and total uranium analyses were added to provide a more complete waste characterization. Gross alpha/beta/gamma, americium-241, and isotopic uranium analyses were eliminated because any potential radioactive contamination should be detected by gamma spectroscopy, specific

isotopic analyses, and total uranium analysis. Cleanup activities began on August 8 and ended on August 21, 1995.

Trenches were excavated into the berm with a backhoe to verify the contents and allow for field screening and visual inspection. Following removal of debris, portions of the berm surface were recontoured. In an attempt to preserve the trees and shrubs that had been reestablished, the trench was not filled nor was the entire berm removed. Exploratory trenches were also dug into soil piles to allow for field screening and visual inspection. If the piles contained debris, the debris was removed and the piles were blended into existing contours. If the piles did not contain debris, the piles were not recontoured. The asphalt, concrete, and the remainder of the debris were excavated using a backhoe and hand-held tools. The debris was field screened for gross alpha/beta/gamma radioactivity and for volatile organic vapors using hand-held instruments. Field screening did not indicate the presence of radioactivity or volatile organic vapors above background levels.

The waste was segregated according to waste type and placed in appropriate, labeled containers, which are being stored at the site pending disposal. Approximately 50 yd<sup>3</sup> of asphalt and concrete were placed in four rolloff containers. Scrap metal was cut into short sections and placed in one 1-yd<sup>3</sup> plastic Kingbag. Wood was placed in two 1-yd<sup>3</sup> plastic Kingbags. Trash consisting of cans, paper, glass, and plastic was placed in one 1-yd<sup>3</sup> plastic Kingbag. Personal protective equipment was placed in plastic bags and placed in one 55-gal drum. The waste will be transported to the appropriate disposal site following evaluation of the waste analyses and completion of the appropriate waste disposal documentation.

RFI sampling data was unavailable prior to developing the VCA sampling plan. Historical evidence indicated that mercury and radiological contamination may be present. Therefore, mercury and the most health conservative indicator radionuclide (Cs-137) were selected as COPCs. Health conservative refers to those chemicals that are most toxic and will produce the lowest cleanup levels. Although mercury was identified as a COPC, the maximum level detected was below its background upper tolerance limit (UTL).

When the RFI sampling data became available, it was reviewed and six additional COPCs were identified. COPCs are chemicals that exceed their respective screening action level (SAL). COPCs identified at PRS 21-013(c) include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, pentachlorophenol, and two radionuclides, radium 224 and thorium 228. Waste characterization data were also reviewed to further refine the selection of chemicals of potential concern. Acetone was detected in the two confirmatory samples (at 11 ug/kg) at three orders of magnitude less than its PRG. No other organic compounds were detected in the confirmatory samples and no inorganic analytes were detected above their respective background UTLs or PRGs. Radioactivity at the site was within naturally occurring levels. Evaluation of the confirmatory analytical data confirmed that there was no residual contamination above PRGs present at the site.

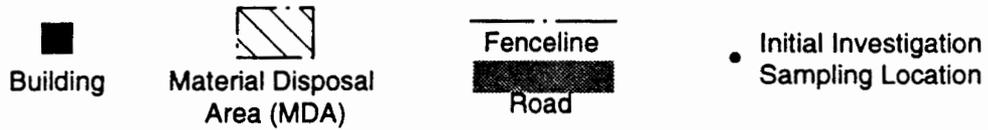
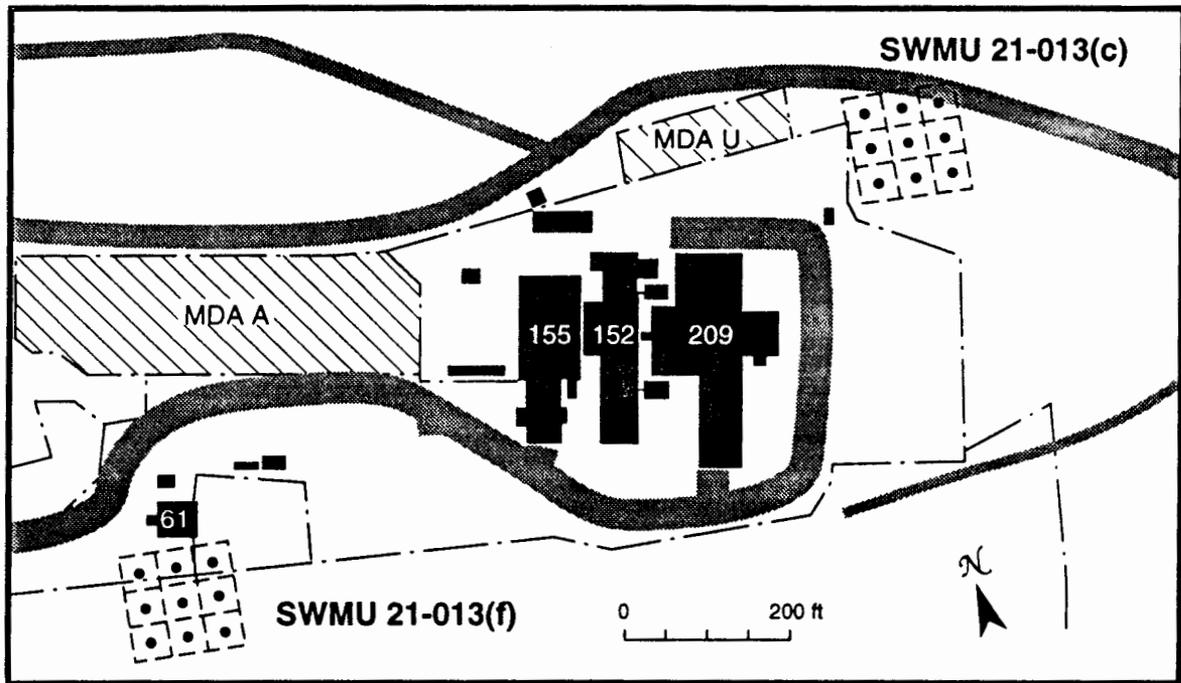
Confirmatory sampling was performed (Figure 2) to verify site cleanup. Analytical results and their comparison with the preliminary remediation goals (PRG) are presented in Table 1. Because there is no detectable residual contamination, no statistical comparison to PRGs could be conducted. Data on the radionuclides and all previously-obtained site characterization data, as well as VCA data, are available and will be provided upon request.

Confirmatory samples were collected on September 5, 1995, and were located where debris was removed from the site. Two confirmatory samples were collected: one at the south end of the earthen berm where the asphalt pile was located, and the other from the large mound near the northwest corner of the PRS. Samples were analyzed for gross alpha and beta by EPA method 900, for gross gamma by EPA method 901.1, volatile organic compounds by SW-846 method 8240, semi-volatile organic compounds by SW-846 method 8270, TAL metals by SW-846 method 6010 and 7471, polychlorinated biphenyls by SW-846 method 8080, tritium by EPA method 906, isotopic uranium by DOE method HASL 300, isotopic plutonium by DOE method HASL 300, americium-241 by EPA method 907, and strontium-90 by Standard Method 704.

Site restoration included discing of disturbed areas with a tractor and disc harrow, then reseeding by hand with native grasses.

## **REQUEST FOR REGULATORY CONCURRENCE**

The results of activities presented herein serve as the formal request for regulator concurrence to remove PRS 21-013(c) from the HsWA Module and as the formal request for DOE concurrence that PRS 21-013(c) no longer be considered a PRS for radiological purposes.



**Figure 14.7-2** Surface disposal area SWMU 21-013(c) from TA-21 Operable Unit RFI Work Plan for ER, May 1991, page 14-67.

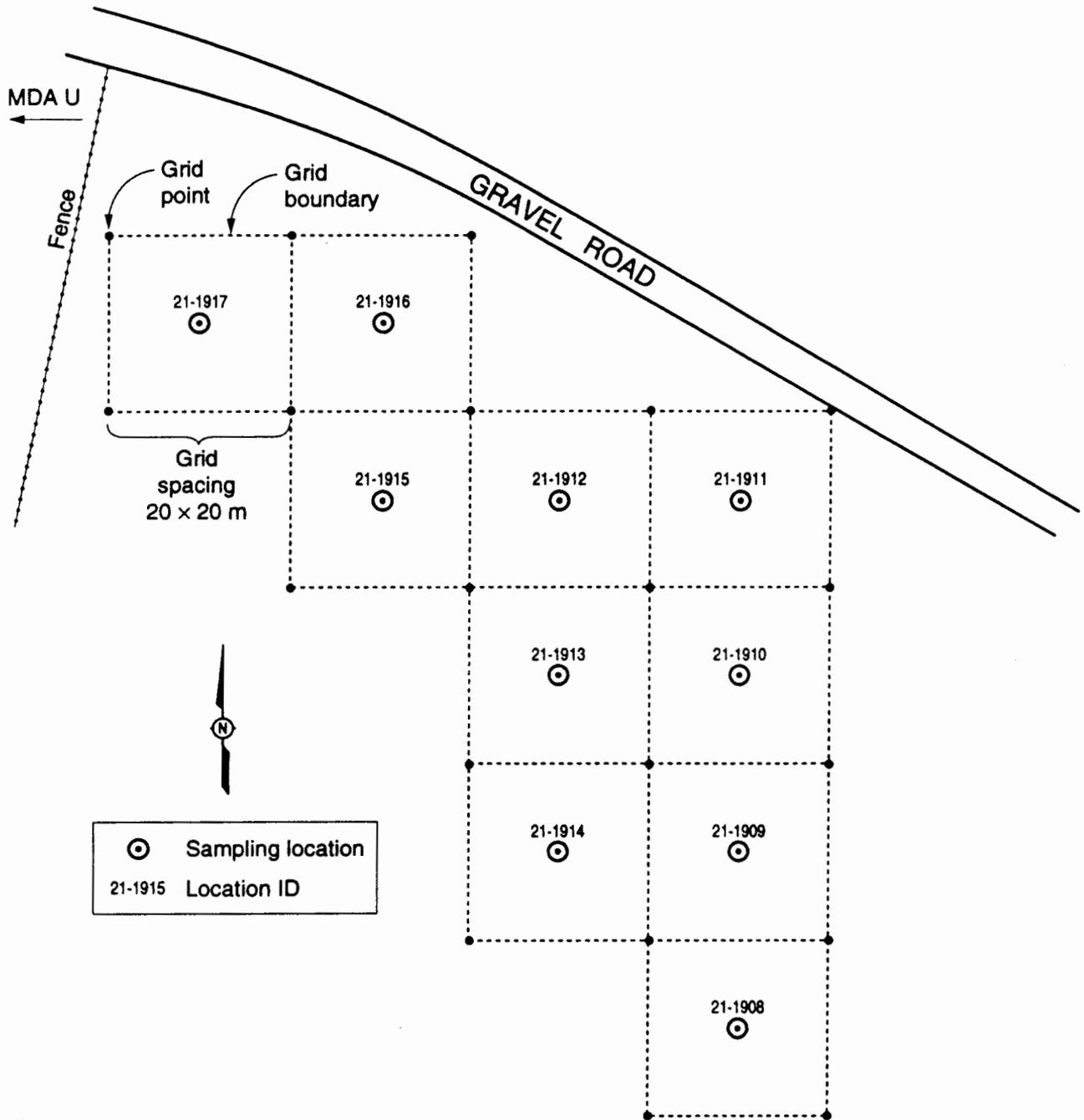


Figure 1. Phase I RFI actual sampling locations at PRS 21-013(c), surface disposal area.

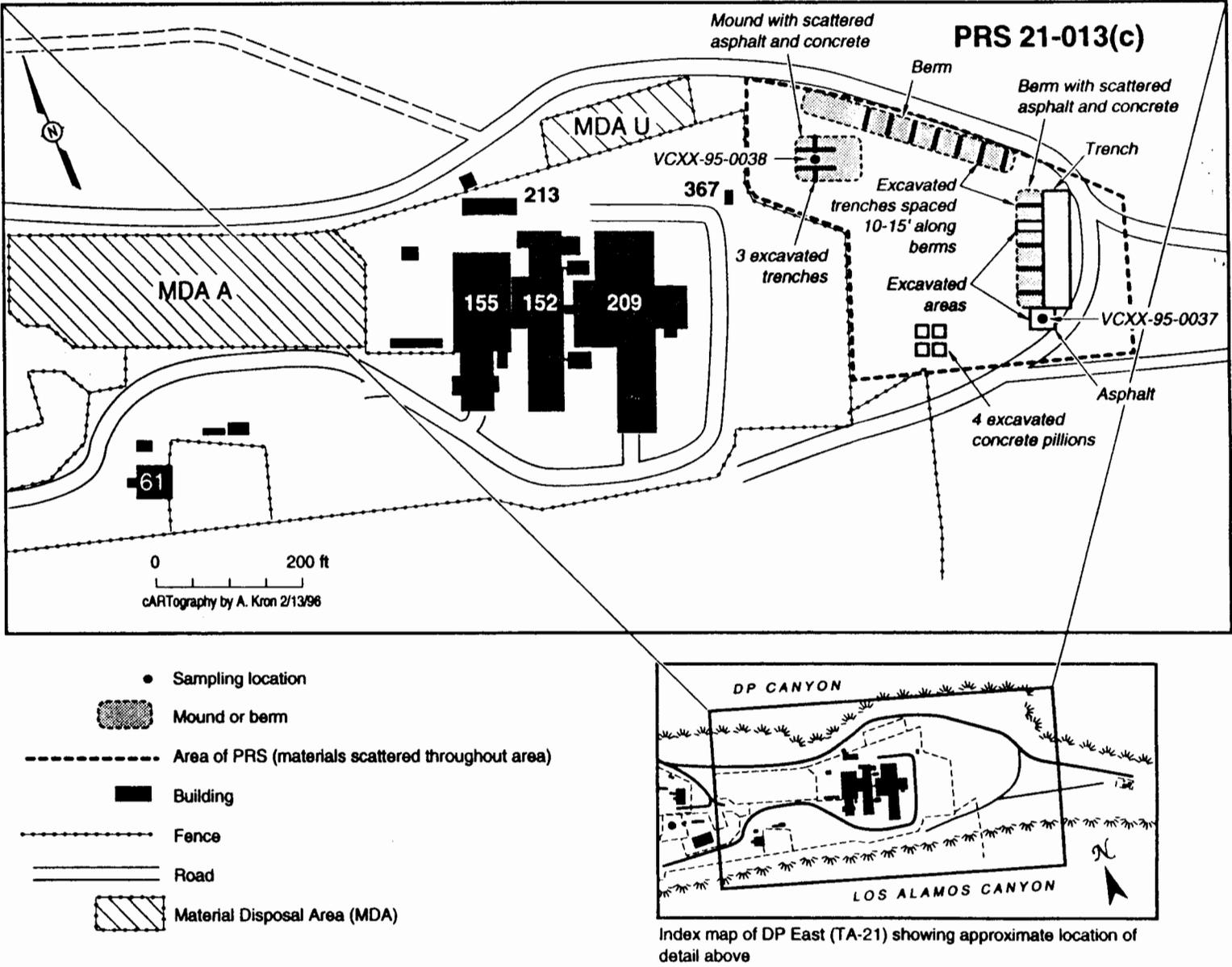


Figure 2. Excavation and confirmatory sampling locations for PRS 21-013(c).

February 5, 1996  
J95412.REV

**Table 1. Summary of Confirmatory Sampling Analytical Results and Data Comparison, Potential Release Site 21-013(c), Surface Disposal Area**

Analyte	Loc ID	Sample ID	Matrix	Sample Value	Units	Depth (In.)	Analysis Qualifier
Acetone	21-09004	VCXX-95-0037	SOIL	0.011	MG/KG	0-6	
Acetone	21-09005	VCXX-95-0038	SOIL	0.011	MG/KG	0-6	
95% UCL of Mean				0.011			
PRG				5.22E+04	MG/KG		
Benzo(a)anthracene	21-09004	VCXX-95-0037		0.35	MG/KG	0-6	UJ
Benzo(a)anthracene	21-09005	VCXX-95-0038		0.34	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				7.84E+00	MG/KG		
Benzo(a)pyrene	21-09004	VCXX-95-0037		0.35	MG/KG	0-6	UJ
Benzo(a)pyrene	21-09005	VCXX-95-0038		0.34	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				7.84E-01	MG/KG		
Benzo(b)fluoranthene	21-09004	VCXX-95-0037		0.35	MG/KG	0-6	UJ
Benzo(b)fluoranthene	21-09005	VCXX-95-0038		0.34	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				7.84E+00	MG/KG		
Pentachlorophenol	21-09004	VCXX-95-0037		1.7	MG/KG	0-6	UJ
Pentachlorophenol	21-09005	VCXX-95-0038		1.6	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				4.77E+01	MG/KG		
R = Rejected because performance requirements in the sample or associated quality control analyses were not met. The analyte may or may not be present.							
U = Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.							

## CERTIFICATION OF COMPLETION

I certify that all work pertaining to the voluntary corrective action (VCA) 21-013(c) has been completed in accordance with the Department of Energy-approved VCA plan and entitled **VCA Plan for Potential Release Site 21-013(c), Surface Disposal Area**. Based on my personal involvement or inquiry of the person or persons who managed this cleanup, 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

28 Sept 95

\_\_\_\_\_  
Date Signed

**FINAL REPORT**

**Voluntary Corrective Action Completion Report  
Potential Release Site 21-013(d),  
Surface Disposal Area**

**Environmental Restoration Project  
Field Unit 1  
Los Alamos National Laboratory**

**February 26, 1996**

**A Department of Energy  
Environmental Cleanup Project**

## Voluntary Corrective Action Completion Report Potential Release Site 21-013(d), Surface Disposal Area

### DESCRIPTION

Potential Release Site (PRS) 21-013(d) is located in an unsecured area within Los Alamos National Laboratory's (Laboratory) Technical Area (TA) 21. The site is accessible from DP Road off State Highway 502. The site is referred to as the "cold dump." The site boundaries are defined to the north by the drop-off into the canyon, to the south by the fence along DP Road, to the west by the site access gate (and the eastern bound of PRS 21-013(e)) and to the east by the eastern fence. The site is vegetated with pine trees, shrubs, and grasses. Prior to the voluntary corrective action (VCA), piles of soil, asphalt, and concrete were present. Other surface debris included scrap metal and wood, cans, paper, glass, cork, and plastic bags. Because radiological contamination is a general characteristic of TA-21, any materials to be removed from the area are assumed to be low-level waste pending confirmation.

PRS 21-013(d) is inactive and was used to dispose of nonradioactive waste chemicals and/or materials and appeared to contain construction debris. The site is included in the Hazardous and Solid Waste Amendments (HSWA) Module of the Laboratory's Resource Conservation and Recovery Act Permit, EPA I.D. NM0890010515.

Prior to the VCA, the "cold dump" area appeared to have been scraped and the material removed. During the VCA at PRS 21-013(e), located northwest of the "cold dump," surface debris was observed in the area surrounding the "cold dump." It was decided to clean up the remaining debris while workers were on location. A plan was submitted detailing the procedures and methods used to implement the VCA.

### RFI HISTORY

RCRA Facilities Investigation (RFI) field work was conducted in August, 1994. The RFI work plan called for a three-section by three-section grid to be laid out across the area where debris was disposed of. The size of the grid sections was not specified in the work plan; however the grid layout was to be based on the figure in the work plan (fig. 14.7-1, TA-21 Operable Unit RFI Work Plan for ER, May 1991) and on visual inspection of the site. The grid sections were to be of approximately equal dimensions.

Radiation surveys were to be performed in the grid area to identify elevated radiation levels. Samples were to be collected at the centers of the grid sections and at areas where radiation levels were elevated. The sampling intervals were to be 0-to-6 in, 0-to-

2.5 ft, 2.5-to-5.0 ft, and 5.0-to-7.5 ft. Each location sampled was to generate a total of four samples. Because the purpose of these investigations was to confirm either the presence or the absence of contamination, the work plan specified that 25% of the 0-to-6 in interval samples and 25% of the deeper samples be sent to off-site laboratories for analyses. Samples were to be selected for off-site analyses and were to include samples with elevated levels of radiation or volatile organic compounds.

The phase I RFI began with a site visit to determine where the sampling grid was to be laid out. The debris piles were scattered, and there was no definite point where the debris associated with PRS 21-013(d) ended and the debris associated with PRS 21-013(e) began. The PRSs are located near the edge of DP Canyon and the locations of debris piles followed the irregular east-west line of the canyon edge. A decision was made to conduct the phase I RFI for the two PRSs together, laying out 26 grid sections in an irregular pattern, as shown in figure 3, Phase I RFI Sampling Plan at PRS 21-013(d,e), to provide the boundaries for the radiation survey. This grid covered the area of interest more efficiently than the grids illustrated in the work plan and met the minimum number of sections and sampling points called for in the work plan. The grid sections were 20-m by 20-m, and grid lines were oriented north-south and east-west. The additional eight grid sections (18 grid sections were specified in the work plan) would only be sampled if radiation survey results indicated the presence of contamination.

The radiation survey was performed using alpha, beta/gamma, and low-energy gamma radiation detection instruments. Detected radiation levels were consistent with the local TA-21 background radiation levels at all but a few locations where radiation levels were marginally elevated. Therefore, no additional sampling locations beyond the 18 specified in the workplan were identified, and the few grid sections that were elevated were sampled and submitted for further analyses.

Nine grid sections at PRS 21-013(d) were sampled resulting in a total of 36 samples. Surface and subsurface samples were collected from the centers of each of 9 grid sections. The 0-6 in sample was collected using a spade or scoop method and the deeper samples were collected using a small, hollow-stem auger drill rig with a split-spoon sampler.

All the samples were field screened for alpha and beta/gamma radiation for worker health and safety and delivered to a mobil radiation laboratory for further radiation screening. In addition, all samples collected were screened for volatile organic compounds using an organic vapor monitor to check the head space of a closed container of soil or tuff from each sampling interval.

Samples collected from PRS 21-013(d) were stored in refrigerators until analytical results from the mobile radiation and chemistry laboratories could be assessed, usually within 24 hours of sample collection. The assessment of the field, mobile radiation laboratory, and mobile chemistry laboratory screening results indicated that there was no significant change in radiation levels from the 0-to-6 in, 0-to-2.5 ft, 2.5-to-

5.0 ft, and 5.0-to-7.5 ft intervals. Elevated organic vapor readings noted during sample collection were attributed to organic matter that was encountered during the drilling. Because all screening data indicated the absence of radioactive or organic contamination, a cross-section was selected from both the surface (0-to-6 in) and the near-surface (0-to-2.5 ft) samples. Three 0-to-6 in interval samples and seven 0-to-2.5 ft interval samples from the nine locations were shipped to an off-site analytical laboratory for a full suite of analyses.

The investigation at PRS 21-013(d) deviated from the work plan in one important area. The RFI work plan called for a field survey for organic vapors because of historical information indicating that non-radioactive chemicals were disposed of at this site. This survey was not done.

All sampling work is complete. No COPCs (i.e., chemicals whose maximum concentrations are greater than their screening action levels [SALs] were identified. No additional COPCs were identified in the MCE. See Appendix B for the RFI sampling results along with the MCE analysis. Because there were no COPCs driving the cleanup at this site, a VCA was deemed appropriate to remove the surface debris. RFI data was collected prior to remediation, and did not include the areas beneath the waste piles (the focus of the VCA effort).

This VCA Completion Report is submitted in lieu of the RFI Report.

## **CORRECTIVE ACTION**

A VCA plan for PRS 21-013(d) was prepared based on the approved VCA plan for PRS 21-013(e), a similar surface disposal area for construction debris. The cleanup followed this VCA plan. Cleanup activities began on August 1 and ended on August 3, 1995. Exploratory trenches were dug into soil piles to allow for field screening and visual inspection. If the piles contained debris, the debris was removed, and the piles were blended into existing contours. If the piles did not contain debris, the piles were not recontoured. The asphalt, concrete, and the remainder of the debris were excavated using a backhoe and hand-held tools. The debris was field screened for gross alpha/beta/gamma radioactivity and for volatile organic vapors using hand-held instruments. Field screening did not indicate the presence of radioactivity or volatile organic vapors above background levels.

The excavated waste was placed in appropriate, labeled containers, which are being stored at the site pending disposal. Approximately 30 yd<sup>3</sup> of asphalt and concrete were placed in two rolloff containers. Approximately 4 yd<sup>3</sup> of miscellaneous debris and trash were placed in plastic bags which were placed in four 1-yd<sup>3</sup> plastic Kingbags. Personal protective equipment was placed in plastic bags which were transported to PRS 21-013(e) and placed in the 55-gal drum that contains PPE from PRS 21-013(e). The waste will be transported to the appropriate disposal site

following evaluation of the waste analyses and completion of the appropriate waste disposal documentation.

Based on a review of existing information and visual inspection of the site, indicator chemicals of concern were identified and include cesium-137 as the health-conservative indicator for radionuclides, and benzo(a)pyrene as the health-conservative indicator for polycyclic aromatic hydrocarbons that may have leached from asphalt. The RFI data was also reviewed and no COPCs were identified. However, because asphalt and other debris was present, confirmatory sampling was conducted after removal of the debris to confirm that no residual contamination was present at the site. Waste characterization data were also reviewed to further refine the selection of chemicals of potential concern.

Confirmatory sampling was performed (Figure 4) to verify site cleanup. Analytical results and their comparison with the preliminary remediation goals (PRG) are presented in Table 2. Evaluation of the confirmatory analytical data confirmed that there was no detectable residual contamination above PRGs present at the site. Radioactivity at the site was determined to be within naturally occurring levels. Because there is no detectable residual contamination, no statistical comparison to PRGs could be conducted. Data on the radionuclides and all previously-obtained site characterization data, as well as VCA data, are available and will be provided upon request.

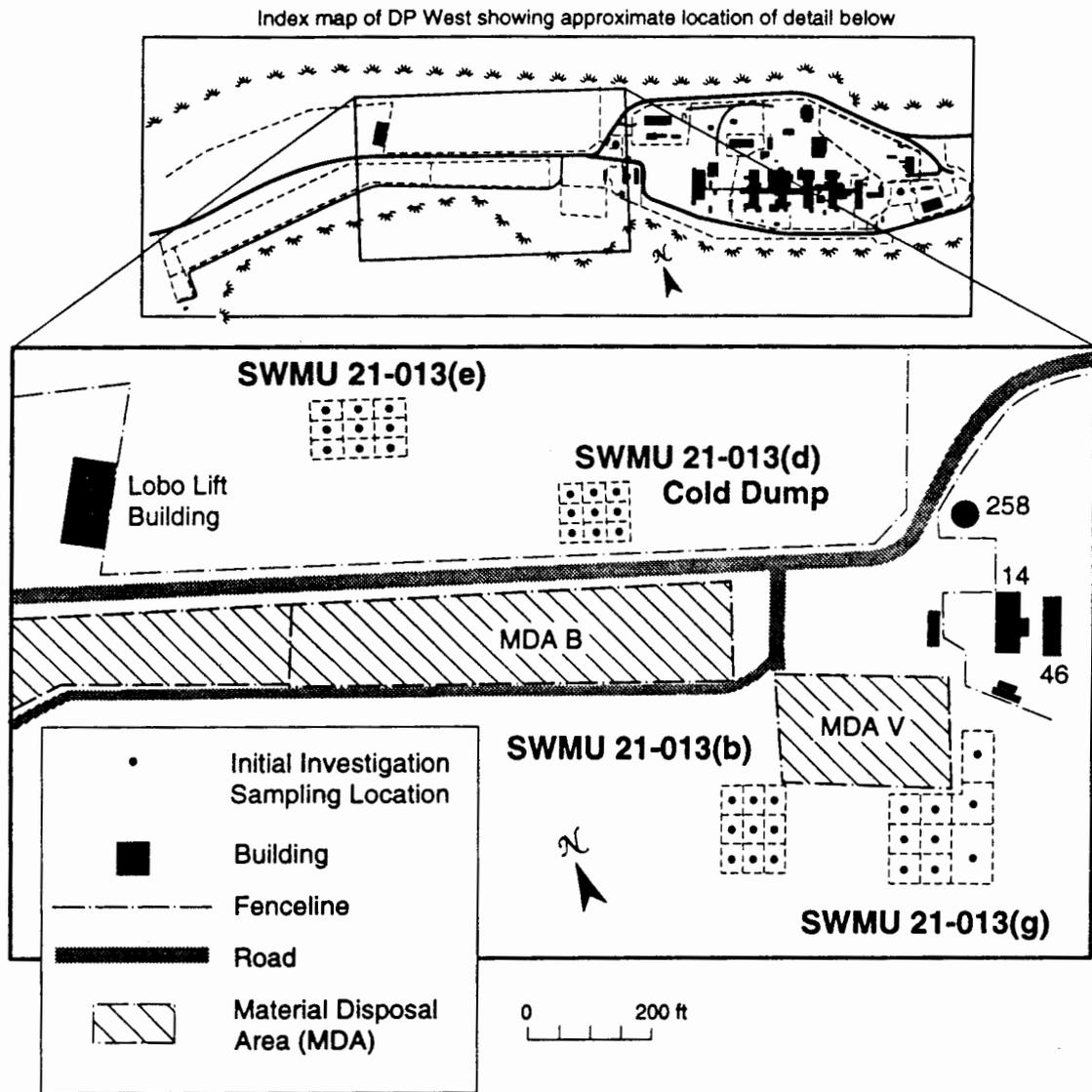
Confirmatory samples were collected on September 1, 1995. A total of two confirmatory samples were collected from the area beneath two large asphalt piles.

Samples were analyzed for gross alpha and beta by EPA method 900, for gross gamma by EPA method 901.1, volatile organic compounds by SW-846 method 8240, semi-volatile organic compounds by SW-846 method 8270, target analyte list metals by SW-846 method 6010 and 7471, polychlorinated biphenyls by SW-846 method 8080, tritium by EPA method 906, isotopic uranium by DOE method HASL 300, isotopic plutonium by DOE method HASL 300, americium-241 by EPA method 907, and strontium-90 by Standard Method 704.

Site restoration included disking of disturbed areas with a tractor and disc harrow, then reseeding by hand with native grasses.

## **REQUEST FOR REGULATORY CONCURRENCE**

The results of activities presented herein serve as the formal request for regulator concurrence to remove PRS 21-013(d) from the HSWA Module and as the formal request for DOE concurrence that PRS 21-013(d) no longer be considered a PRS for radiological purposes.



**Figure 14.7-1** Surface disposal areas SWMUs 21-013(d) and (e) from TA-21 Operable Unit RFI Work Plan for ER, May 1991, page 14-66.

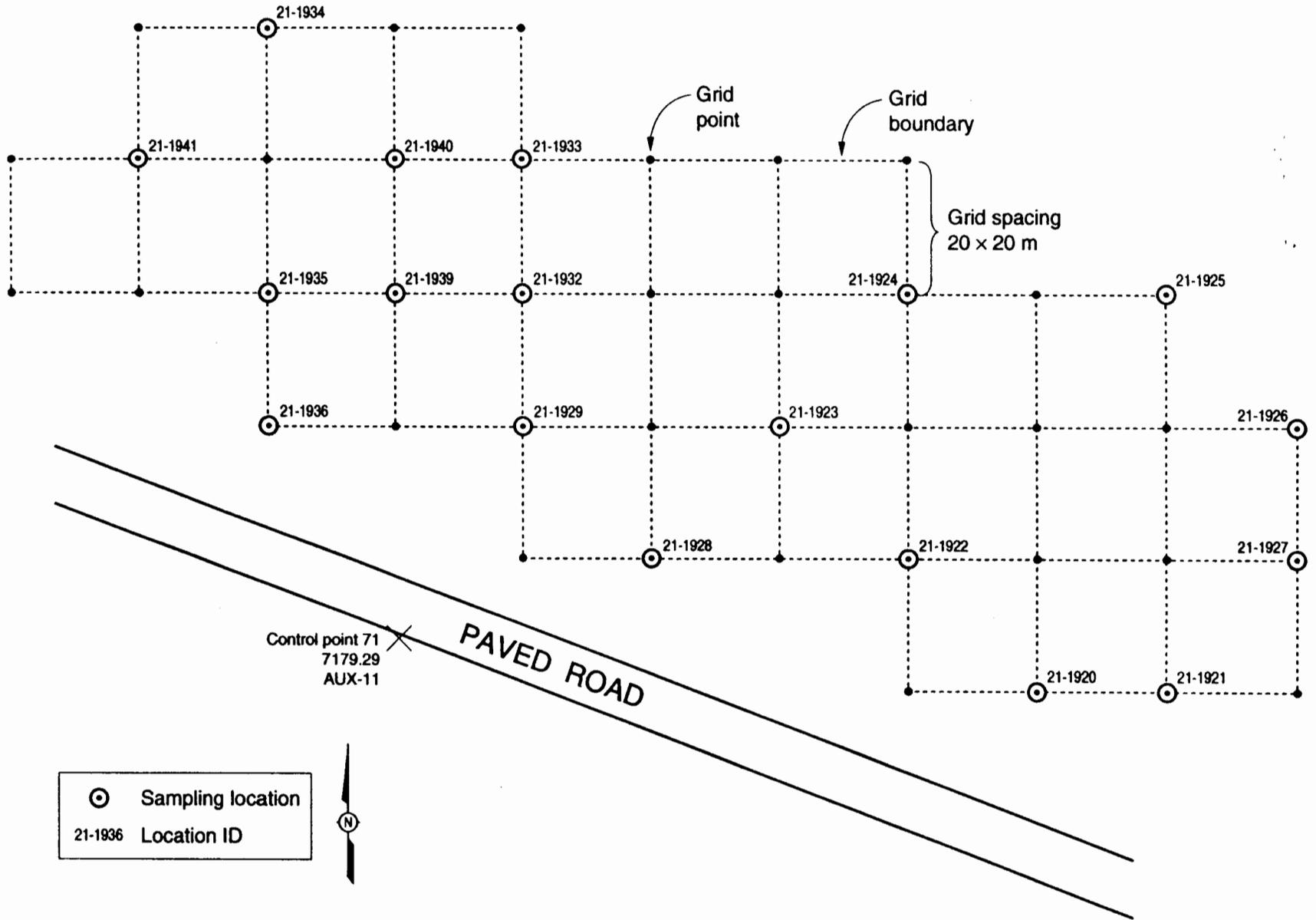
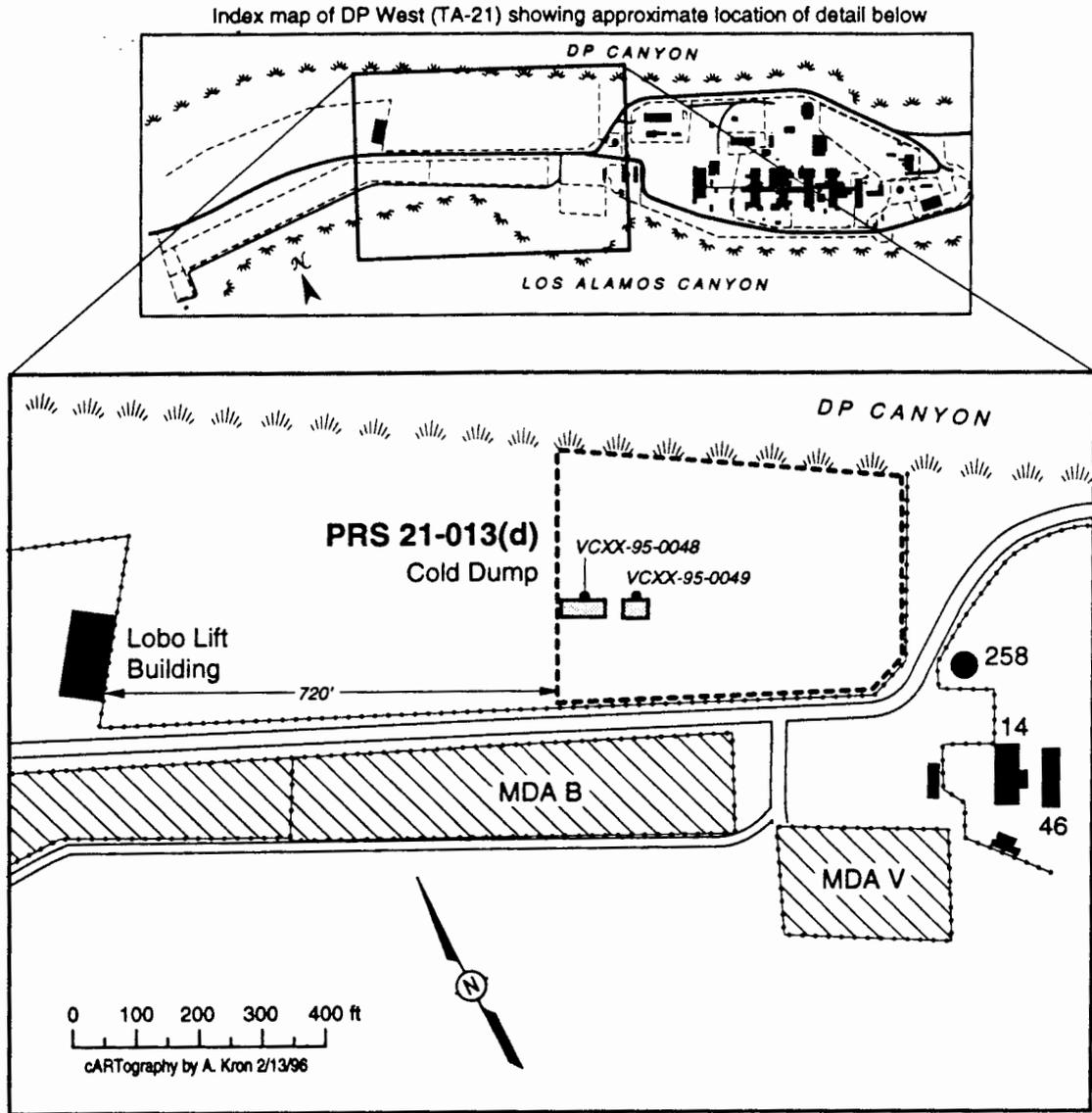


Figure 3. Phase I RFI actual sampling locations at PRS 21-013(d), surface disposal area.



- Sampling location
- ▨ Asphalt pile
- - - - - Area of PRS (debris and trash scattered throughout area)
- Building
- · - · - · - Fence
- ==== Road
- ▨ Material Disposal Area (MDA)
- ⋄ Edge of mesa

Figure 4. Excavation and confirmatory sampling locations for PRS 21-013(d), cold dump.

**TABLE 2. Summary of Confirmatory Sampling Analytical Results and Data Comparison, Potential Release Site 21-013(d), Surface Disposal Area**

Analyte	Loc ID	Sample ID	Matrix	Sample Value	Units	Depth (in.)	Analysis Qualifier
2-Chloronaphthalene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
2-Chloronaphthalene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				4.17E+04	MG/KG		
2-Methylnaphthalene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
2-Methylnaphthalene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				N/A			
Acenaphthene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Acenaphthene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				3.13E+04	MG/KG		
Acenaphthylene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Acenaphthylene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				N/A			
Anthracene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Anthracene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				1.57E+05	MG/KG		
Benzo(a)anthracene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Benzo(a)anthracene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				7.84E+00	MG/KG		
Benzo(a)pyrene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Benzo(a)pyrene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				7.84E-01	MG/KG		
Benzo(b)fluoranthene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Benzo(b)fluoranthene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				7.84E+00	MG/KG		

U = Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.

**TABLE 2. Summary of Confirmatory Sampling Analytical Results and Data Comparison, Potential Release Site 21-013(d), Surface Disposal Area (continued)**

Analyte	Loc ID	Sample ID	Matrix	Sample Value	Units	Depth (in.)	Analysis Qualifier
Benzo(ghi)perylene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Benzo(ghi)perylene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				N/A			
Benzo(k)fluoranthene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Benzo(k)fluoranthene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				7.84E+01	MG/KG		
Carbazole	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Carbazole	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				2.86E+02	MG/KG		
Chrysene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Chrysene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				7.84E+02	MG/KG		
Dibenzo(a,h)anthracene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Dibenzo(a,h)anthracene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				7.84E-01	MG/KG		
Dibenzofuran	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Dibenzofuran	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				2.09E+03	MG/KG		
Fluoranthene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Fluoranthene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				2.06E+04	MG/KG		
Fluorene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Fluorene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			

U = Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.

**TABLE 2. Summary of Confirmatory Sampling Analytical Results and Data Comparison, Potential Release Site 21-013(d), Surface Disposal Area (continued)**

Analyte	Loc ID	Sample ID	Matrix	Sample Value	Units	Depth (In.)	Analysis Qualifier
PRG				2.06E+04	MG/KG		
Indeno(1,2,3-c,d)pyrene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Indeno(1,2,3-c,d)pyrene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				7.84E+00	MG/KG		
Naphthalene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Naphthalene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				N/A			
Phenanthrene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Phenanthrene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				N/A			
Pyrene	21-09010	VCXX-95-0048	SOIL	0.35	MG/KG	0-3	U
Pyrene	21-09011	VCXX-95-0049	SOIL	3.5	MG/KG	0-3	U
95% UCL of Mean				ND			
PRG				1.57E+04	MG/KG		

U = Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.

## CERTIFICATION OF COMPLETION

I certify that all work pertaining to the voluntary corrective action (VCA) 21-013(d) has been completed in accordance with the Department of Energy-approved VCA plan and entitled **VCA Plan for Potential Release 21-013(d), Surface Disposal Area**. Based on my personal involvement or inquiry of the person or persons who managed this cleanup, 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.



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

28 Sept 95

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Date Signed

**FINAL REPORT**

**Voluntary Corrective Action Completion Report  
Potential Release Site 21-013(e),  
Surface Disposal Area**

**Environmental Restoration Project  
Field Unit 1  
Los Alamos National Laboratory**

**February 26, 1996**

**A Department of Energy  
Environmental Cleanup Project**

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**Voluntary Corrective Action Completion Report  
Potential Release Site 21-013(e),  
Surface Disposal Area**

**DESCRIPTION**

Potential Release Site (PRS) 21-013(e) is located in an unsecured area within Los Alamos National Laboratory's (Laboratory) Technical Area (TA) 21. The site is accessible from DP Road off State Highway 502. The site boundaries are defined to the north by the drop-off into the canyon, to the south by the fence along DP Road, to the west by the fence adjacent to the Lobo Lift building and to the east by the site access gate approximately 720 feet from the western boundary (also the western bound of PRS 21-013(d)). The site is vegetated with pine trees, shrubs, and grasses. Prior to the voluntary corrective action (VCA), there were piles of soil, asphalt and concrete on the site. Other surface debris included a wooden ramp, scrap metal, car parts, aluminum, wire, wood, cans, paper, glass, and plastic bags. Because radiological contamination is a general characteristic of TA-21, any materials to be removed from the area are assumed to be low-level waste pending confirmation.

PRS 21-013(e) is an inactive surface disposal area, which appears to have been used for disposal of construction debris. It is not known when materials were disposed of at this site. This site is included in the Hazardous and Solid Waste Amendments (HSWA) module of the Laboratory's Resource Conservation and Recovery Act Permit, EPA I.D. NM0890010515.

**RFI HISTORY**

RCRA Facilities Investigation (RFI) field work was conducted in September and October, 1994. The RFI work plan called for a three-section by three-section grid to be laid out across the area where debris was disposed of. The size of the grid sections was not specified in the work plan; however the grid layout was to be based on the figure in the work plan (fig. 14.7-1, TA-21 Operable Unit RFI Work Plan for ER, May 1991) and on visual inspection of the site. The grid sections were to be of approximately equal dimensions.

Radiation surveys were to be performed in the grid area to identify elevated radiation levels. Samples were to be collected at the centers of the grid sections and at areas where radiation levels were elevated. The sampling intervals were to be 0-to-6 in, 0-to-2.5 ft, 2.5-to-5.0 ft, and 5.0-to-7.5 ft. Each location sampled was to generate a total of four samples. Because the purpose of these investigations was to confirm either the presence or the absence of contamination, the work plan specified that 25% of the 0-to-6 in interval samples and 25% of the deeper samples be sent to off-site laboratories

for analyses. Samples were to be selected for off-site analyses and were to include samples with elevated levels of radiation or volatile organic compounds.

The phase I RFI began with a site visit to determine where the sampling grid was to be laid out. The debris piles were scattered, and there was no definite point where the debris associated with PRS 21-013(e) ended and the debris associated with PRS 21-013(d) began. The PRSs are located near the edge of DP Canyon and the locations of debris piles followed the irregular east-west line of the canyon edge. A decision was made to conduct the phase I RFI for the two PRSs together, laying out 26 grid sections in an irregular pattern, as shown in figure 5, Phase I RFI Sampling Plan at PRS 21-013(d,e), to provide the boundaries for the radiation survey. This grid covered the area of interest more efficiently than the grids illustrated in the work plan and met the minimum number of sections and sampling points called for in the work plan. The grid sections were 20-m by 20-m, and grid lines were oriented north-south and east-west. The additional eight grid sections (18 grid sections were specified in the work plan) would only be sampled if radiation survey results indicated the presence of contamination.

The radiation survey was performed using alpha, beta/gamma, and low-energy gamma radiation detection instruments. Detected radiation levels were consistent with the local TA-21 background radiation levels at all but a few locations where radiation levels were marginally elevated. Therefore, no additional sampling locations beyond the 18 specified in the workplan were identified, and the few grid sections that were elevated were sampled and submitted for further analyses.

Nine grid sections at PRS 21-013(e) were sampled resulting in a total of 36 samples. Surface and subsurface samples were collected from the centers of each of 9 grid sections. The 0-6 in sample was collected using a spade or scoop method and the deeper samples were collected using a small, hollow-stem auger drill rig with a split-spoon sampler.

All the samples were field screened for alpha and beta/gamma radiation for worker health and safety and delivered to a mobil radiation laboratory for further radiation screening. In addition, all samples collected were screened for volatile organic compounds using an organic vapor monitor to check the head space of a closed container of soil or tuff from each sampling interval.

Samples collected from PRS 21-013(e) were stored in refrigerators until analytical results from the mobile radiation and chemistry laboratories could be assessed, usually within 24 hours of sample collection. The assessment of the field, mobile radiation laboratory, and mobile chemistry laboratory screening results indicated that there was no significant change in radiation levels from the 0-to-6 in, 0-to-2.5 ft, 2.5-to-5.0 ft, and 5.0-to-7.5 ft intervals and that no volatile organic compounds were present. Because all screening data indicated the absence of contamination, a cross-section was selected from both the surface (0-to-6 in) and the near-surface (0-to-2.5 ft) samples. Two 0-to-6 in interval samples and seven 0-to-2.5 ft interval samples from

the nine locations were shipped to an off-site analytical laboratory for a full suite of analyses.

All sampling work is complete. The RFI data indicated that only thorium-228 exceeded its SAL. No additional COPCs were identified in the MCE. See Appendix C for the RFI sampling results along with the MCE analysis.

Thorium-228 is a daughter product of thorium-232 and is difficult to detect with gamma spectroscopy. Because of the large uncertainty associated with this sample, the sample value is considered to fall within background levels. In addition, field screening of the site prior to remediation indicated that radioactivity at the site was not significantly elevated above background. Because there were no COPCs driving the cleanup at this site, a VCA was deemed appropriate to remove the surface debris. RFI data was collected prior to remediation, and did not include the areas beneath the waste piles (the focus of the VCA effort).

This VCA Completion Report is submitted in lieu of the RFI Report.

## **CORRECTIVE ACTION**

The cleanup followed the approved VCA Plan, with the following deviations: A modified confirmatory sampling plan was implemented, which added analyses for target analyte list (TAL) metals and eliminated toxicity characteristic leaching procedure (TCLP) metals. The TAL metal analysis was added to the confirmatory sampling to identify any potential contamination by total metals. The waste characterization sampling was modified to eliminate analysis for TCLP metals and add analysis for TAL metals because high levels of metals were not expected to be present based on previous sampling. In addition, reactive cyanide and total uranium analyses were added to provide a more complete waste characterization. Americium-241 and isotopic uranium analyses were eliminated because any contamination from these radionuclides should be detected using gamma spectroscopy and total uranium analysis. Cleanup activities began on July 19 and ended on July 31, 1995.

Exploratory trenches were dug into soil piles to allow for field screening and visual inspection. If the piles contained debris, the debris was removed and the piles were blended into existing contours. If the piles did not contain debris, the piles were not recontoured. The asphalt, concrete, and the remainder of the debris were excavated using a backhoe and hand-held tools. The debris was field screened for gross alpha/beta/gamma radioactivity and for volatile organic vapors using held-held instruments. Field screening did not indicate the presence of radioactivity or volatile organic vapors above background levels.

The excavated waste was segregated according to waste type and placed in appropriate, labeled containers, which are being stored at the site pending disposal. Approximately 75 yd<sup>3</sup> of asphalt and concrete were placed in five rolloff containers.

Approximately 15 yd<sup>3</sup> of wood from the wooden ramp were placed in one rolloff container. Approximately six yd<sup>3</sup> of scrap metal were wrapped with plastic sheets. Miscellaneous debris and trash were placed in plastic bags which were placed in six 1-yd<sup>3</sup> plastic Kingbags. Personal protective equipment was placed in plastic bags which were placed in one 55-gal drum. The waste will be transported to the appropriate disposal site following evaluation of the waste analyses and completion of the appropriate waste disposal documentation.

Based on a review of existing information and visual inspection of the site, cesium-137 was selected as a health-conservative indicator for radionuclides. The RFI data was also reviewed and thorium 228 was identified as a COPC. Waste characterization data were reviewed to further refine the selection of chemicals of potential concern. In the confirmatory samples, arsenic, chromium, and zinc were detected below their respective background upper tolerance levels, and lead was detected below its PRG. Radioactivity at the site was within naturally occurring levels. The statistical analysis indicates with 95 percent confidence that all residual levels of contamination are below PRGs. Data on the radionuclides are available upon request.

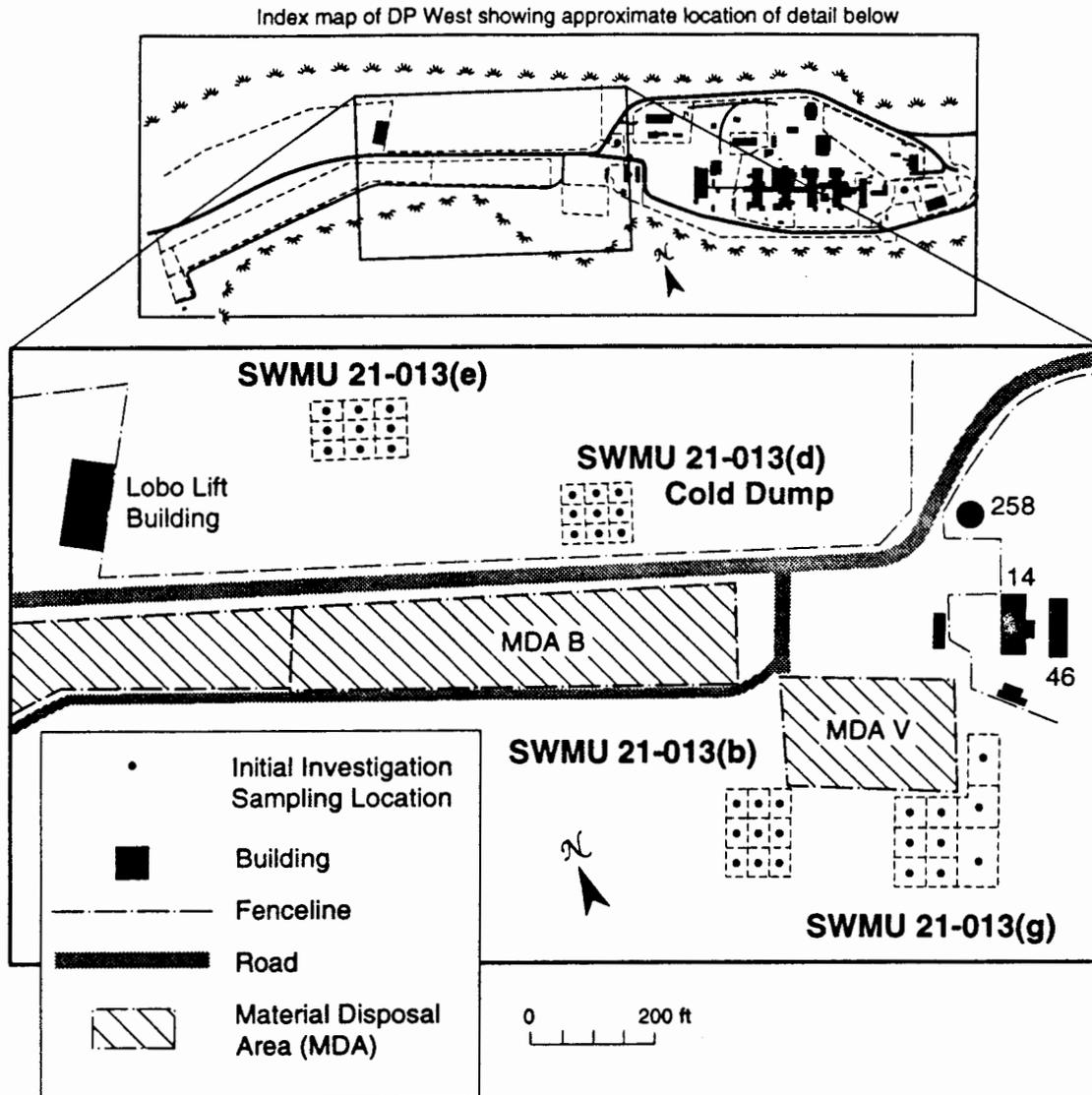
Confirmatory sampling was performed (Figure 6) to verify site cleanup. Analytical results and their comparison with the preliminary remediation goals (PRG) are presented in Table 3. All previously-obtained site characterization data as well as VCA data are available and will be provided upon request.

Confirmatory samples were collected on September 1, 1995. A total of two confirmatory samples were collected from the area beneath two large asphalt piles. The samples were analyzed for gross alpha and beta by EPA method 900, for gross gamma by EPA method 901.1, volatile organic compounds by SW-846 method 8240, semi-volatile organic compounds by SW-846 method 8270, TAL metals by SW-846 method 6010 and 7471, polychlorinated biphenyls by SW-846 method 8080, tritium by EPA method 906, isotopic uranium by DOE method HASL 300, isotopic plutonium by DOE method HASL 300, americium-241 by EPA method 907, and strontium-90 by Standard Method 704.

Site restoration included discing of disturbed areas with a tractor and disc harrow, then reseeding by hand with native grasses.

## **REQUEST FOR REGULATORY CONCURRENCE**

The results of activities presented herein serve as the formal request for regulator concurrence to remove PRS 21-013(e) from the HSWA Module and as the formal request for DOE concurrence that PRS 21-013(e) no longer be considered a PRS for radiological purposes.



**Figure 14.7-1 Surface disposal areas SWMUs 21-013(d) and (e) from TA-21 Operable Unit RFI Work Plan for ER, May 1991, page 14-66.**

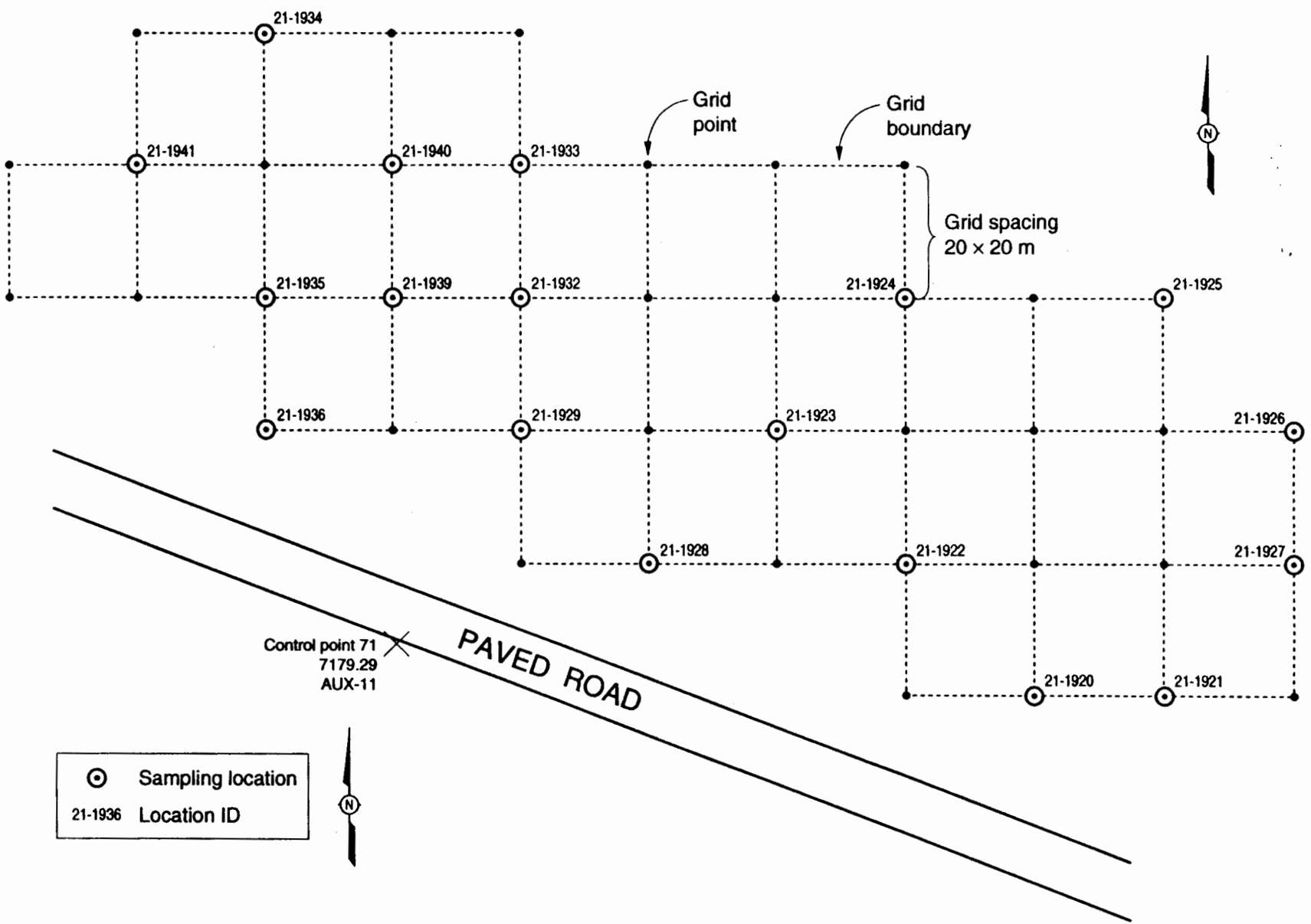


Figure 5. Phase I RFI actual sampling locations at PRS 21-013(e), surface disposal area.

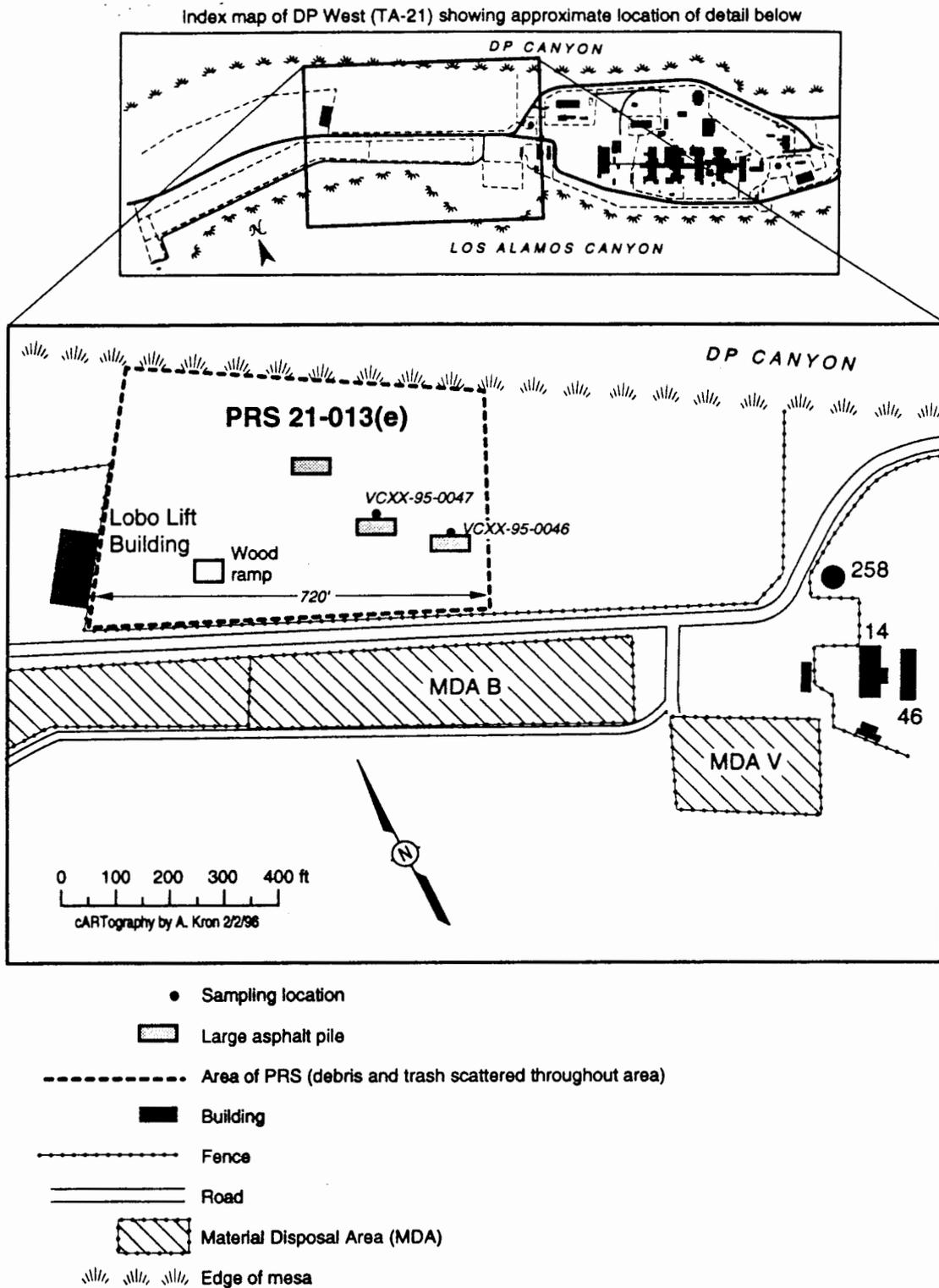


Figure 6. Excavation and confirmatory sampling locations for PRS 21-013(e), cold dump.

**TABLE 3. Summary of Confirmatory Sampling Analytical Results and Data Comparison, Potential Release Site 21-013(e), Surface Disposal Area**

Analyte	Loc ID	Sample ID	Matrix	Sample Value	Units	Depth (In.)	Analysis Qualifier
Benzoic Acid	21-09008	VCXX-95-0046	SOIL	1.8	MG/KG	0-6	U
Benzoic Acid	21-09009	VCXX-95-0047	SOIL	1.6	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				2.08E+06	MG/KG		
bis(2-Ethylhexyl)phthalate	21-09008	VCXX-95-0046	SOIL	0.37	MG/KG	0-6	U
bis(2-Ethylhexyl)phthalate	21-09009	VCXX-95-0047	SOIL	1.7	MG/KG	0-6	
95% UCL of Mean				3.2	MG/KG		
PRG				4.09E+02	MG/KG		
Di-n-octyl phthalate	21-09008	VCXX-95-0046	SOIL	0.37	MG/KG	0-6	U
Di-n-octyl phthalate	21-09009	VCXX-95-0047	SOIL	0.34	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				2.58E+03	MG/KG		
Acetone	21-09008	VCXX-95-0046	SOIL	0.011	MG/KG	0-6	U
Acetone	21-09009	VCXX-95-0047	SOIL	0.01	MG/KG	0-6	U
Acetone	NA	VCXX-95-0250	LIQUID	10	UGL	N/A	U
95% UCL of Mean				ND			
PRG				2.04E+05	MG/KG		
Methylene Chloride	21-09008	VCXX-95-0046	SOIL	0.0055	MG/KG	0-6	U
Methylene Chloride	NA	VCXX-95-0250	LIQUID	5	UGL	N/A	U
Methylene Chloride	21-09009	VCXX-95-0047	SOIL	0.0052	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				1.87E+03	MG/KG		
Arsenic	21-09008	VCXX-95-0046	SOIL	3	MG/KG	0-6	
Arsenic	21-09009	VCXX-95-0047	SOIL	2.1	MG/KG	0-6	U
95% UCL of Mean				4.9	MG/KG		
PRG (Background UTL)*				1.16E+01	MG/KG		
Chromium	21-09008	VCXX-95-0046	SOIL	7.7	MG/KG	0-6	
Chromium	21-09009	VCXX-95-0047	SOIL	3.4	MG/KG	0-6	
95% UCL of Mean				11.8	MG/KG		
PRG (Background UTL)*				3.42E+01	MG/KG		

\* For metals, whenever the preliminary remediation goal (PRG) is less than the background UTL, PRG will equal the background UTL.

U = Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.

**TABLE 3. Summary of Confirmatory Sampling Analytical Results and Data Comparison, Potential Release Site 21-013(e), Surface Disposal Area (continued)**

Analyte	Loc ID	Sample ID	Matrix	Sample Value	Units	Depth (In.)	Analysis Qualifier
Benzoic Acid	21-09008	VCXX-95-0046	SOIL	1.8	MG/KG	0-6	U
Lead	21-09008	VCXX-95-0046	SOIL	43	MG/KG	0-6	
Lead	21-09009	VCXX-95-0047	SOIL	82	MG/KG	0-6	
95% UCL of Mean				119	MG/KG		
PRG				1.00E+03	MG/KG		
Zinc	21-09008	VCXX-95-0046	SOIL	31	MG/KG	0-6	
Zinc	21-09009	VCXX-95-0047	SOIL	18	MG/KG	0-6	
95% UCL of Mean				43.5	MG/KG		
PRG				1.75E+05	MG/KG		

\* For metals, whenever the preliminary remediation goal (PRG) is less than the background UTL, PRG will equal the background UTL.

U = Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.

## CERTIFICATION OF COMPLETION

I certify that all work pertaining to the voluntary corrective action (VCA) 21-013(e) has been completed in accordance with the Department of Energy-approved VCA plan and entitled **VCA Plan for Potential Release Site 21-013(e), Surface Disposal Area**. Based on my personal involvement or inquiry of the person or persons who managed this cleanup, 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.



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

28 Sept 95

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Date Signed

**FINAL REPORT**

**Voluntary Corrective Action Completion Report  
Potential Release Site 31-001,  
Septic System Outfall**

**Environmental Restoration Project  
Field Unit 1  
Los Alamos National Laboratory**

**February 26, 1995**

**A Department of Energy  
Environmental Cleanup Project**

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**Voluntary Corrective Action Completion Report  
Potential Release Site 31-001,  
Septic System Outfall**

**DESCRIPTION**

Potential Release Site (PRS) 31-001 is located at Los Alamos National Laboratory's (Laboratory) former Technical Area 31. Known as the East Receiving Yard, the site is on East Mesa north of East road and west of the Los Alamos Airport. The site is accessible from Nambe Place off State Route 502. The site is on the north facing canyon wall, approximately 20 yards from the mesa top. The slope of the canyon wall at this elevation is approximately 60 degrees.

The PRS is the outfall from the sanitary septic system for the former supply warehouse. Prior to the cleanup, it was expected that material removed from the site could be classified as hazardous waste. The site is included in the Hazardous and Solid Waste Amendments (HSWA) Module of the Laboratory's Resource Conservation and Recovery Act (RCRA) Permit, EPA I.D. NM0890010515.

A RCRA Facility Investigation (RFI) has been completed for the site and was submitted in May 1995. The results indicated that the only area that met voluntary corrective action (VCA) criteria was the area directly below the septic tank outfall pipe, where lead, arsenic, mercury and polychlorinated biphenyls (PCB) were indicated.

**CORRECTIVE ACTION**

The cleanup of the PRS followed the approved VCA plan, with the following two deviations: Due to the extreme slope on which the PRS is located, backfilling and reseeding were considered to be ineffective. Visual inspection indicated that the backfilled materials would be washed down the slope during subsequent rainfall events before reseeding could prevent erosion. A modified confirmatory sampling plan was implemented, which added analyses for target analyte list (TAL) metals and eliminated toxicity characteristic leaching procedure metals. The TAL metal analysis was added to the confirmatory sampling to identify any potential contamination by total metals. Cleanup began on August 4 and ended on August 7, 1995.

During the VCA, the site and waste were field screened for gross alpha/beta/gamma radioactivity, volatile organic vapors and PCBs using hand-held instruments and field test kits. Field testing confirmed the presence of PCBs; however, field screening did not indicate the presence of radioactivity or volatile organic vapors above background levels. Confirmatory samples were collected on September 5, 1995. Two confirmatory samples were collected from the excavated area, one at the location of the outfall, and

the other 4 feet below the outfall. Samples were analyzed for gross alpha and beta by EPA method 900, gross gamma by EPA method 901.1, PCBs by SW-846 method 8080, and TAL metals by SW-846 method 6010 and 7471. Radioactivity at the site was within naturally occurring levels. Data on the radionuclides are available upon request.

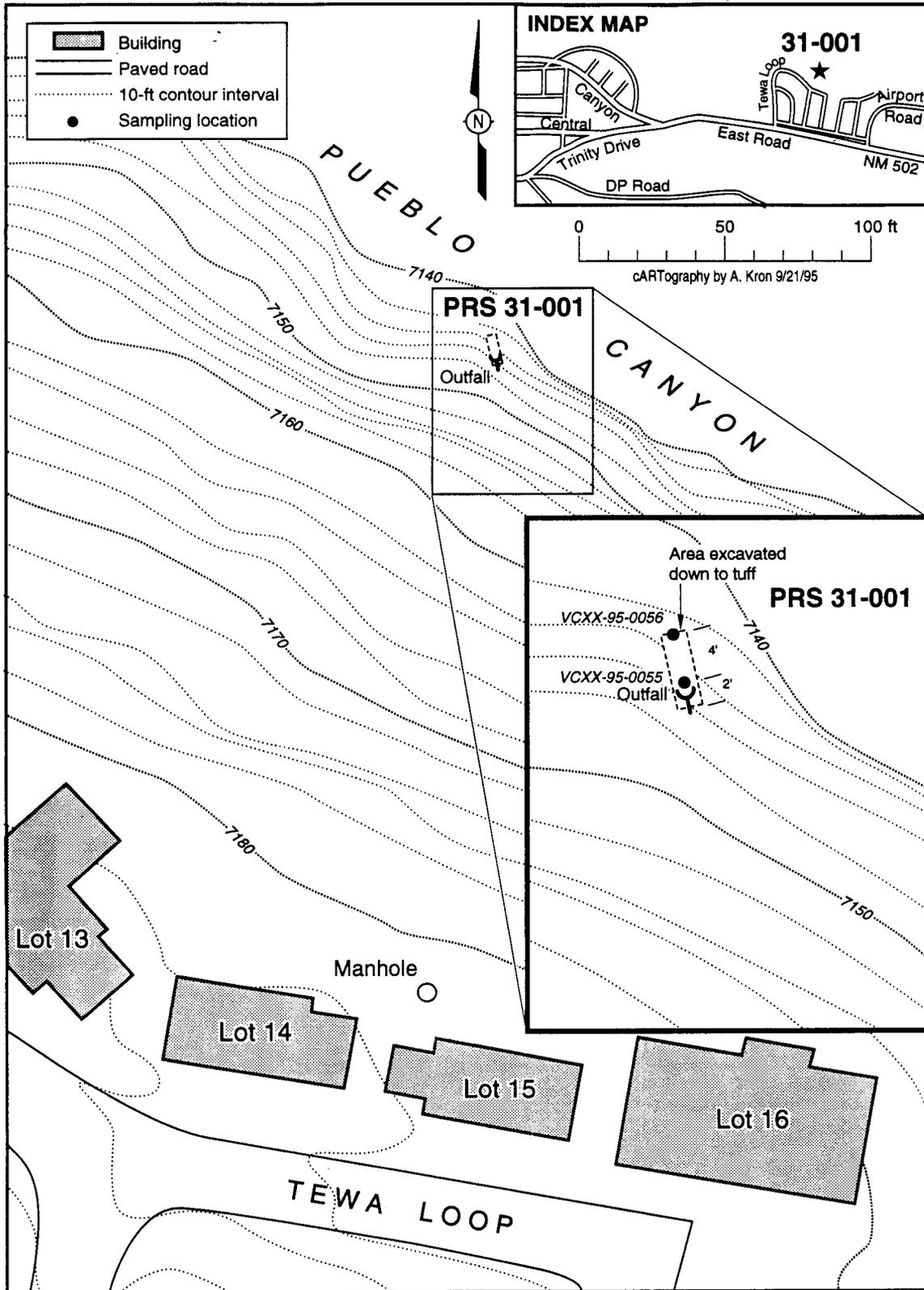
Soil was excavated from 2 feet above the outfall to a distance 4 feet below the outfall down to the underlying tuff. The soil and approximately 7 feet of iron pipe were excavated with hand tools, placed in plastic bags that were placed in four 55-gallon drums. Three ft<sup>3</sup> of clay pipe, metal debris, and personal protective equipment were placed in plastic bags that were placed in a single 55-gallon drum. The containers are appropriately labeled and are being stored at the site pending disposal. The waste will be transported to the appropriate disposal site following evaluation of the waste analyses and completion of the appropriate waste disposal documentation.

Although four chemicals of potential concern (COPCs) were identified in the RFI report for this site, only PCBs were identified as a human health COPC (i.e., the maximum concentration exceeded its SAL). Arsenic, lead, and mercury were identified as ecological COPCs (i.e., the maximum concentration exceeded their ESALs). Additional sampling at the site indicated that although PCBs were present, the 95 percent upper confidence limits (UCL) on the arithmetic mean for arsenic, lead, and mercury were below their respective background upper tolerance limits (UTL). Therefore, three confirmatory samples were collected at the septic system outfall and were analyzed for PCBs. Evaluation of the confirmatory analytical data confirmed that there was no detectable residual contamination above PRGs present at the site. Because there is no detectable residual contamination, no statistical comparison to PRGs could be conducted.

Confirmatory sampling was performed (Figure 1) to verify site cleanup. Analytical results and their comparison with the preliminary remediation goals (PRG) are presented in Table 1. All previously-obtained site characterization data, as well as VCA data, are available and will be provided upon request.

## **REQUEST FOR REGULATORY CONCURRENCE**

The results of activities presented herein serve as the formal request for regulator concurrence to remove PRS 31-001 from the HSWA Module.



**Figure 7. Excavation and confirmatory sampling locations for PRS 31-001, Septic System Outfall**

**Table 4. Confirmatory Sampling Analytical Data for  
PRS 31-001, Septic System Outfall**

Analyte	Loc ID	Sample ID	Matrix	Sample Value	Units	Depth (in.)	Analysis Qualifier
Aroclor-1016	31-09000	VCXX-95-0055	SOIL	0.033	MG/KG	0-6	U
Aroclor-1016	31-09001	VCXX-95-0056	SOIL	0.035	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				1.00E+00	MG/KG		
Aroclor-1221	31-09000	VCXX-95-0055	SOIL	0.033	MG/KG	0-6	U
Aroclor-1221	31-09001	VCXX-95-0056	SOIL	0.035	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				1.00E+00	MG/KG		
Aroclor-1232	31-09000	VCXX-95-0055	SOIL	0.033	MG/KG	0-6	U
Aroclor-1232	31-09001	VCXX-95-0056	SOIL	0.035	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				1.00E+00	MG/KG		
Aroclor-1242	31-09000	VCXX-95-0055	SOIL	0.033	MG/KG	0-6	U
Aroclor-1242	31-09001	VCXX-95-0056	SOIL	0.035	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				1.00E+00	MG/KG		
Aroclor-1248	31-09000	VCXX-95-0055	SOIL	0.033	MG/KG	0-6	U
Aroclor-1248	31-09001	VCXX-95-0056	SOIL	0.035	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				1.00E+00	MG/KG		
Aroclor-1254	31-09000	VCXX-95-0055	SOIL	0.033	MG/KG	0-6	U
Aroclor-1254	31-09001	VCXX-95-0056	SOIL	0.035	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				1.00E+00	MG/KG		
Aroclor-1260	31-09000	VCXX-95-0055	SOIL	0.033	MG/KG	0-6	U
Aroclor-1260	31-09001	VCXX-95-0056	SOIL	0.035	MG/KG	0-6	U
95% UCL of Mean				ND			
PRG				1.00E+00	MG/KG		
Total PCB 95% UCL of Mean				ND			
PRG				1.00E+00	MG/KG		

U=Material analysed for but not detected.

Analytical result reported is less than the sample quantification limit.

## CERTIFICATION OF COMPLETION

I certify that all work pertaining to the voluntary corrective action (VCA) 31-001 has been completed in accordance with the Department of Energy-approved VCA plan and entitled **VCA Plan for Potential Release Site 31-001, Septic System Outfall**. Based on my personal involvement or inquiry of the person or persons who managed this cleanup, 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

**APPENDIX A**  
**RFI SAMPLING ANALYSIS AND DATA FOR**  
**PRS 21-013(c)**

## RFI SAMPLING ANALYSIS AND DATA FOR PRS 21-013(c)

### Background Comparison

All detected metals except for mercury were reported at concentrations less than background upper tolerance limits (UTLs). Mercury was detected above its UTL of 0.1 mg/kg. Radionuclides have been addressed in the main body of the text. All RFI data is available upon request.

### Human Health Screening Assessment

All detected organic analytes and all inorganic analytes above their respective background UTLs are compared to their respective screening action levels (SALs). Based on this comparison, each analyte is placed into one of three categories: equal to or exceeds SAL, no SAL, or below SAL.

**Above SAL.** Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and pentachlorophenol were detected above their respective SALs and are discussed in the Voluntary Corrective Action Completion Report, Potential Release Site 21-013(c), Surface Disposal Area, RFI History. The SAL for pentachlorophenol in the Appendix A Tables is dated. The new, revised SAL for pentachlorophenol (2.5 mg/km) was used in the screening assessment.

**No SAL.** Two organic chemicals, benzo(g,h,i)perylene, and phenanthrene have no SAL. These two chemicals are polycyclic aromatic hydrocarbons (PAHs). PAHs are found in conjunction with other PAHs. Therefore, these PAHs will be accounted for by the disposition of the PAHs in the above SAL category (benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene).

**Below SAL.** Analytical results indicated that mercury was detected ten times (0.14 mg/kg to 0.65 mg/kg) at concentrations above background levels and below its SAL of 23 mg/kg. Ten organic chemicals were detected. Acenaphthene was detected twice at concentrations of 0.4 and 2.3 mg/kg. Anthracene was detected once at 0.57 mg/kg. Bis(2-ethylhexyl)phthalate was detected eleven times (0.5 mg/kg to 6.5 mg/kg). Chrysene was detected once at 1.1 mg/kg. 2,4-Dinitrotoluene was detected once at 3.3 mg/kg. Fluoranthene was detected once at 3.0 mg/kg. Indeno(1,2,3-cd)pyrene was detected once at 0.42 mg/kg. 4-Nitrophenol was detected once at 4.2 mg/kg. Pyrene was detected four times (0.36 mg/kg to 3.3 mg/kg). Toluene was detected once at 0.007 mg/kg.

Analytes detected below SAL (and above their background UTL, if one is available) are further analyzed in the MCE to evaluate the possibility of potential adverse health effects due to the combination of multiple chemicals.

To evaluate multiple chemical effects, analytes were grouped according to their toxicological effects (carcinogenic or non-carcinogenic). SALs for all chemicals were

normalized to one and summed. The results of the analysis based on both the carcinogenic and non-carcinogenic effects are less than one at 0.94, and 0.26, respectively, indicating that potential resultant adverse health effects from exposure would be unlikely. Therefore, all of the analytes with concentrations below their respective SALs are eliminated from further consideration.

### MULTIPLE CHEMICAL EVALUATION FOR PRS 21-013(c)

ANALYTE	MAXIMUM CONCENTRATION (MG/KG)	SOIL SAL (MG/KG)	MAXIMUM CONCENTRATION/SAL (NORMALIZED VALUES)
<b>MCE Based on Carcinogenic Effects</b>			
Bis(2-ethylhexyl)phthalate	6.5	32	0.20
Chrysene	1.1	24	0.05
Indeno[1,2,3-cd]pyrene	0.42	0.61	0.69
Normalized Sum			0.94
<b>MCE Based on Non-Carcinogenic Effects</b>			
Mercury	4.5	23	0.20
Acenaphthene	2.3	360	0.00
Anthracene	0.57	19	0.03
Dinitrotoluene [2,4-]	3.3	130	0.03
Fluoranthene	3	2600	0.001
Nitrophenol [4-]	4.2	130000	3.2E-04
Pyrene	3.3	2000	0.002
Toluene	0.007	1900	3.7E-05
Normalized Sum			0.26

### Ecological Risk Screening

The habitats on the mesa top can be characterized as artificial urban plant and animal communities and, therefore, do not need to be addressed further from the ecological risk perspective.

### QA/QC Analysis

Two confirmatory samples (VCXX-95-0037 and 0038) were analyzed for gross alpha, beta and gamma, TAL metals, PCBs, tritium, isotopic U and Pu, <sup>241</sup>Am, <sup>90</sup>Sr, volatiles and semivolatiles at this site. For the alpha, beta and gamma, PCBs, tritium, isotopic U and Pu, <sup>241</sup>Am, <sup>90</sup>Sr and volatiles all QC parameters were within allowed limits and the data are usable without qualification. For the semivolatiles, sample VCXX-95-0037

had internal standards and matrix spike values outside allowed limits. The lab determined that this sample, which was chosen for the matrix spike and matrix spike duplicate sample, was the subject of cross-contamination. Therefore, the semivolatile data for sample VCXX-95-0037 were qualified 'R'. The sample was rerun in another batch, several days outside holding times and no analytes were detected. The data are qualified 'UJ' (there were no detects except for di-n-butylphtalate) for being analyzed outside recommended holding times. Di-n-butylphtalate was found in the blank and in the samples. However, all sample detects were within 5 times the blank value, and the reporting limits were raised accordingly. In the TAL metal analysis, the matrix spike for As was outside allowed limits. However, all other QC parameters were within allowed limits. The data are not qualified because of the matrix spike recovery. All other data are usable without qualification.

**ATTACHMENT A1**  
**MULTIPLE CHEMICAL PRG ANALYSIS**

(1 Page)

**MULTIPLE CHEMICAL PRG ANALYSIS**

The following presents a comparison of the 95% UCL of the mean concentrations of the COPCs identified from the RFI data with their respective PRGs. In addition, a multiple chemical PRG risk analysis using RFI data is presented. The methodology describing the multiple chemical PRG analysis (Appendix F from the approved VCA plan for this PRS) is presented in Attachment 2.

**Comparison of 95% UCL Mean of COPCs with Their PRGs**

Analyte	95% UCL of the mean (mg/kg)	PRG (mg/kg)	PRG Comparison Ratio (95% UCL mean/PRG)
Benzo(a)anthracene	0.21	7.84	0.03
Benzo(f)fluoranthene	0.22	7.84	0.03
Benzo(a)pyrene	0.21	0.78	0.27
Pentachlorophenol	0.31	47.7	0.07
<b>TOTAL SUM</b>			0.40

$$\text{Multiple PRG Risk} = \Sigma (95\% \text{ UCL mean/PRG}) \times 10^{-6}$$

The multiple PRG risk is  $4 \times 10^{-7}$  and is below the target value of  $10^{-6}$ . Thus, the site is considered to meet cleanup criteria for the areas of the PRS separate from the waste piles. The VCA addresses the waste piles and soils beneath the waste piles.

**ATTACHMENT A2**

**APPROACH TO USING SITE-SPECIFIC CHEMICAL PRGS**

(2 Pages)

## APPROACH TO USING SITE-SPECIFIC CHEMICAL PRGS

### 1.0 MULTIPLE CHEMICAL PRG ANALYSIS

Following clean-up operations, confirmatory sampling and analysis will be conducted for specific COPCs.

A multiple chemical PRG risk analysis will be conducted for exposure to residual radioactivity, carcinogenic risk, and noncarcinogenic health hazard when two or more confirmatory chemical concentrations are at or below their respective PRGs within one or more of the aforementioned groups. Non-radioactive chemicals with both carcinogenic and noncarcinogenic toxicity criteria will be included in both the carcinogen and noncarcinogen groups. The multiple chemical PRG risk analysis will be estimated by summing the fractional contribution (i.e., site-specific concentration/PRG) of each chemical. The site-specific concentration will be based on the maximum or 95% upper confidence level (UCL) of the arithmetic mean.

For exposure to residual radioactivity under the industrial exposure scenario, the fractional contribution of each will be summed and multiplied by the 15 mrem/yr target exposure level:

$$\text{Multiple PRG Exposure Level} = [(conc_x/PRG_x) + (conc_y/PRG_y) + (conc_z/PRG_z)] \times 15 \text{ mrem/yr}$$

If the multiple PRG risk is at or below the target exposure level of 15 mrem/yr, then the site will be considered to meet clean-up criteria for exposure to residual radioactivity.

For cancer risk estimates, the fractional contribution of each will be summed and multiplied by  $10^{-6}$  target cancer risk.

$$\text{Multiple PRG Risk} = [(conc_x/PRG_x) + (conc_y/PRG_y) + (conc_z/PRG_z)] \times 10^{-6}$$

If the multiple PRG risk is at or below the target value of  $10^{-6}$  then the site will be considered to meet clean-up criteria for carcinogenic risk.

For noncancer hazard estimates, the fractional contribution of each will be summed and compared with a target hazard index of 1:

$$\text{PRG Hazard Index} = [(conc_x/PRG_x) + (conc_y/PRG_y) + (conc_z/PRG_z)]$$

If the PRG hazard index is at or below the target hazard index of 1, then the site will be considered to meet clean-up criteria for noncarcinogenic risk.

If the multiple PRG risk analysis for radionuclides, non-radioactive carcinogens, or noncarcinogens exceeds target values, further clean-up or characterization of the site may be warranted.

## 1.1 Concentration Term

The maximum detected concentration will be used in the initial PRG risk analysis and multiple PRG risk analysis. Use of the maximum detected concentration provides the worst case analysis and is not considered to be representative of actual exposure concentrations. If maximum concentrations are at or below their respective PRG levels and multiple PRG risk analysis target levels are not exceeded, the site will be considered to meet clean-up criteria. If, however, use of maximum concentrations results in exceeding the target levels, a 95% UCL of the arithmetic mean will be calculated and used in the PRG analysis and multiple PRG risk analysis. The 95% UCL of the mean provides a conservative estimate of the mean concentration and accounts for uncertainties due to limited sampling. If possible, the 95% UCL of the mean will be calculated using sample concentration data gathered over the entire exposure unit for the industrial site. For exposure areas with limited data or extreme variability in the measured data, the 95% UCL of the mean may be greater than the maximum concentration. If this occurs, the maximum concentration will be used as the concentration term.

**APPENDIX B**  
**RFI SAMPLING RESULTS FOR**  
**PRS 21-013(d)**

## RFI SAMPLING RESULTS FOR PRS 21-013(d)

### Background Comparison

All detected metals except for lead, mercury, and thallium were reported at concentrations less than their respective background upper tolerance limits (UTLs). Lead was detected above its background UTL (39 mg/kg) in four samples (41.6 mg/kg to 89.4 mg/kg). Mercury was detected in six samples (0.12 mg/kg to 0.87 mg/kg) above its background UTL (0.1 mg/kg). Thallium was detected above its background UTL (0.09 mg/kg) in one sample at 0.85 mg/kg. Radionuclides have been addressed in the main body of the text. All RFI data is available upon request.

### Human Health Screening Assessment

All detected organic analytes and all inorganic analytes above their respective background UTLs are compared to their respective screening action levels (SALs). Based on this comparison, each analyte is placed into one of three categories: equal to or exceeds SAL, no SAL, or below SAL.

Above SAL. No analytes fell into this category.

No SAL. No analytes fell into this category.

Below SAL. Analytical results indicated that lead, mercury and thallium were detected at concentrations above background levels and below their respective SALs of 400 mg/kg, 23 mg/kg, and 5.4 mg/kg. Acetone was the only organic detected at a concentration of 0.13 mg/kg. Analytes detected below SAL (and above their background UTL, if one is available) are further analyzed in the MCE to evaluate the possibility of potential adverse health effects due to the combination of multiple chemicals.

To evaluate multiple chemical effects, analytes were grouped according to their toxicological effects (carcinogenic or non-carcinogenic). SALs for all chemicals were normalized to one and summed. There are no analytes in the carcinogenic category. The result of the analysis based on non-carcinogenic effects is less than one at 0.4, indicating that potential resultant adverse health effects from exposure would be unlikely. Therefore, all of the analytes with concentrations below their respective SALs are eliminated from further consideration.

### MULTIPLE CHEMICAL EVALUATION FOR PRS 21-013(d)

ANALYTE	MAXIMUM CONCENTRATION (MG/KG)	SOIL SAL (MG/KG)	MAXIMUM CONCENTRATION/SAL (NORMALIZED VALUES)
Acetone	0.13	2000	0.00007
Lead	89.4	400	0.2
Mercury	0.34	23	0.01
Thallium	0.85	5.4	0.2
Normalized Sum			0.4

#### Ecological Risk Screening

The habitats on the mesa top can be characterized as artificial urban plant and animal communities and, therefore, do not need to be addressed further from the ecological risk perspective.

#### QA/QC Analysis

Two confirmatory samples (VCXX-95-0048 and 0049) were analyzed for gross alpha, beta and gamma, TAL metals, PCBs, tritium, isotopic U and Pu, <sup>241</sup>Am, <sup>90</sup>Sr, volatiles and semivolatiles at this site. For the alpha, beta and gamma, PCBs, tritium, isotopic U and Pu, <sup>241</sup>Am, <sup>90</sup>Sr and volatiles all QC parameters were within allowed limits and the data are usable without qualification. There were several high matrix spike recoveries in the semivolatile analysis. However, since there were no detects in the samples, this does not affect the data. In the TAL metal analysis, the matrix spike for As was outside allowed limits. However, all other QC parameters were within allowed limits. The data are not qualified because of the matrix spike recovery. All other data are usable without qualification.

**APPENDIX C**  
**RFI SAMPLING RESULTS FOR**  
**PRS 21-013(e)**

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## RFI SAMPLING RESULTS FOR PRS 21-013(e)

### Background Comparison

All detected metals except for mercury were reported at concentrations less than background upper tolerance limits (UTLs). Mercury was detected in two samples (0.1 mg/kg and 0.19 mg/kg) greater than or equal to its UTL (0.1 mg/kg). Radionuclides have been addressed in the main body of the text. All RFI data is available upon request.

### Human Health Screening Assessment

All detected organic analytes and all inorganic analytes above their respective UTLs are compared to their respective screening action levels (SALs). Based on this comparison, each analyte is placed into one of three categories: equal to or exceeds SAL, no SAL, or below SAL.

Above SAL. No analytes fell into this category.

No SAL. No analytes fell into this category.

Below SAL. Analytical results indicated that mercury was detected at a concentration above background levels and below the SAL of 23 mg/kg. Acetone was the only organic detected, at a concentration of 0.1 mg/kg. Analytes detected below SAL (and above their background UTL, if one is available) are further analyzed in the MCE to evaluate the possibility of potential adverse health effects due to the combination of multiple chemicals.

To evaluate multiple chemical effects, analytes were grouped according to their toxicological effects (carcinogenic or non-carcinogenic). SALs for all chemicals were normalized to one and summed. There are no analytes in the carcinogenic category. The result of the analysis based on non-carcinogenic effects is less than one at 0.008, indicating that potential resultant adverse health effects from exposure would be unlikely. Therefore, all of the analytes with concentrations below their respective SALs are eliminated from further consideration.

**MULTIPLE CHEMICAL EVALUATION FOR PRS 21-013(e)**

<b>ANALYTE</b>	<b>MAXIMUM CONCENTRATION (MG/KG)</b>	<b>SOIL SAL (MG/KG)</b>	<b>MAXIMUM CONCENTRATION/SAL (NORMALIZED VALUES)</b>
Acetone	0.1	2000	0.00005
Mercury	0.19	23	0.008
Normalized Sum			0.008

**Ecological Risk Screening**

The habitats on the mesa top can be characterized as artificial urban plant and animal communities and, therefore, do not need to be addressed further from the ecological risk perspective.

**QA/QC Analysis**

Two confirmatory samples (VCXX-95-0048 and 0049) were analyzed for gross alpha, beta and gamma, TAL metals, PCBs, tritium, isotopic U and Pu, <sup>241</sup>Am, <sup>90</sup>Sr, volatiles and semivolatiles at this site. For the alpha, beta and gamma, PCBs, tritium, isotopic U and Pu, <sup>241</sup>Am, <sup>90</sup>Sr and volatiles all QC parameters were within allowed limits and the data are usable without qualification. There were several high matrix spike recoveries in the semivolatile analysis. However, since there were no detects in the samples, this does not affect the data. In the TAL metal analysis, the matrix spike for As was outside allowed limits. However, all other QC parameters were within allowed limits. The data are not qualified because of the matrix spike recovery. All other data are usable without qualification.