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Nevada
Environmental
Restoration
Project

National Nuclear Security Administration

Closure Report for Corrective Action Unit 528: Polychlorinated Biphenyls Contamination Nevada Test Site, Nevada

Controlled Copy No.:_____

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September 2006

Environmental Restoration
Project

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office

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CLOSURE REPORT FOR CORRECTIVE ACTION UNIT 528: POLYCHLORINATED BIPHENYLS CONTAMINATION NEVADA TEST SITE, NEVADA

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Las Vegas, Nevada

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CLOSURE REPORT FOR
CORRECTIVE ACTION UNIT 528:
POLYCHLORINATED BIPHENYLS CONTAMINATION
NEVADA TEST SITE, NEVADA

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BN	Bechtel Nevada
CAI	Corrective Action Investigation
CAIP	Corrective Action Investigation Plan
CAP	Corrective Action Plan
CAS	Corrective Action Site
CAU	Corrective Action Unit
COC	contaminant of concern
COPC	contaminant of potential concern
CR	Closure Report
CSM	conceptual site model
DOE/NV	U.S. Department of Energy, Nevada Operations Office
DQI	data quality indicator
DQO	data quality objective
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
FFACO	*Federal Facility Agreement and Consent Order*
FSR	field-screening results
ft	foot (feet)
GRO	gasoline-range organics
IDW	investigation-derived waste
LASL	Los Alamos Scientific Laboratory
µg/kg	microgram(s) per kilogram
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
MRL	minimum reporting limit
NAC	*Nevada Administrative Code*
NBMG	Nevada Bureau of Mines and Geology
ND	not detected above minimum reporting limits
NDEP	Nevada Division of Environmental Protection

ACRONYMS AND ABBREVIATIONS (continued)

NNSA/NSO	U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office
NNSA/NV	U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office
NTS	Nevada Test Site
PA	preliminary assessment
PAL	preliminary action level
PCBs	polychlorinated biphenyls
ppm	part(s) per million
PRG	preliminary remediation goal
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	*Resource Conservation and Recovery Act*
SAIC	Science Applications International Corporation
SVOC	semivolatile organic compound
TCC	Test Cell C
TCLP	Toxicity Characterization Leaching Procedure
TPH	total petroleum hydrocarbons
TSCA	*Toxic Substances Control Act*
UR	Use Restriction
VOC	volatile organic compound
yd^3	cubic yard(s)

EXECUTIVE SUMMARY

Corrective Action Unit (CAU) 528 is identified in the *Federal Facility Agreement and Consent Order* (FFACO) of 1996 as Polychlorinated Biphenyls Contamination (FFACO, 1996). CAU 528 is located in Area 25 of the Nevada Test Site and consists of one Corrective Action Site (CAS), CAS 25-27-03, Polychlorinated Biphenyls Surface Contamination.

CAU 528 closure activities were conducted from May 2006 to July 2006 according to the FFACO and the Nevada Division of Environmental Protection-approved Corrective Action Plan for CAU 528 (U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office, 2005). The approved corrective action alternative was closure in place with administrative controls. All waste generated during the closure of CAU 528 was appropriately managed and disposed.

CAS 25-27-03 consists of 12 areas impacted with total petroleum hydrocarbons and/or polychlorinated biphenyls (PCBs). At Areas 1 through 6 and Areas 8 through 12, use restriction (UR) warning signs were posted around the perimeter of the impacted areas and URs were implemented. The "CAU Land-Use Restriction Information" form and a figure showing the locations of the surveyed points delineating the use-restricted areas are included in Appendix D of this report. At Area 7, a total of approximately 9.5 cubic yards of soil impacted with PCBs above the *Toxic Substances Control Act* action level of 25 milligrams per kilogram (mg/kg) was excavated, stored in B-25 boxes, and disposed at the Area 9 U10c Landfill. Waste disposition documentation is included in Appendix C of this report. Soil samples were collected to verify that PCB concentrations in the remaining soil were less than 25 mg/kg. A summary of the soil sample results is included as Appendix B of this report. Area 7 lies within the boundary of Area 11; therefore, remaining soil within Area 7 impacted with PCBs below 25 mg/kg lies within the Area 11 UR boundary.

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1.0 INTRODUCTION

Corrective Action Unit (CAU) 528 is identified in the *Federal Facility Agreement and Consent Order* (FFACO) of 1996 as Polychlorinated Biphenyls Contamination (FFACO, 1996). CAU 528 is located in Area 25 of the Nevada Test Site (NTS) (Figure 1) and consists of one Corrective Action Site (CAS), CAS 25-27-03, Polychlorinated Biphenyls Surface Contamination.

1.1 PURPOSE

This Closure Report (CR) describes the closure activities performed at CAU 528, Polychlorinated Biphenyls Contamination, as presented in the Nevada Division of Environmental Protection (NDEP)-approved Corrective Action Plan (CAP) (U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office [NNSA/NSO], 2005). The approved closure alternative was closure in place with administrative controls. This CR provides a summary of the completed closure activities, documentation of waste disposal, and analytical data to confirm that the remediation goals were met.

1.2 SCOPE

Previous site characterization work completed in 2003-2004 found soil containing total petroleum hydrocarbons (TPH) at concentrations greater than the action level of 100 milligrams per kilogram (mg/kg) and/or polychlorinated biphenyls (PCBs) at concentrations greater than the action level of 1 mg/kg at 12 areas within CAS 25-27-03 (NNSA/NSO, 2004). The objective of the closure activities was to close the site by posting Use Restriction (UR) warning signs and implementing URs for the 12 areas and excavating and disposing of soil within Area 7 containing PCBs at concentrations greater than the *Toxic Substances Control Act* (TSCA) action level of 25 mg/kg.

1.3 CLOSURE REPORT CONTENTS

This CR includes the following sections:

- Section 1.0 - Introduction
- Section 2.0 - Closure Activities
- Section 3.0 - Waste Disposition
- Section 4.0 - Closure Verification Results
- Section 5.0 - Conclusions and Recommendations
- Section 6.0 - References
- Appendix A - Data Quality Objectives
- Appendix B - Sample Analytical Results
- Appendix C - Waste Disposition Documentation

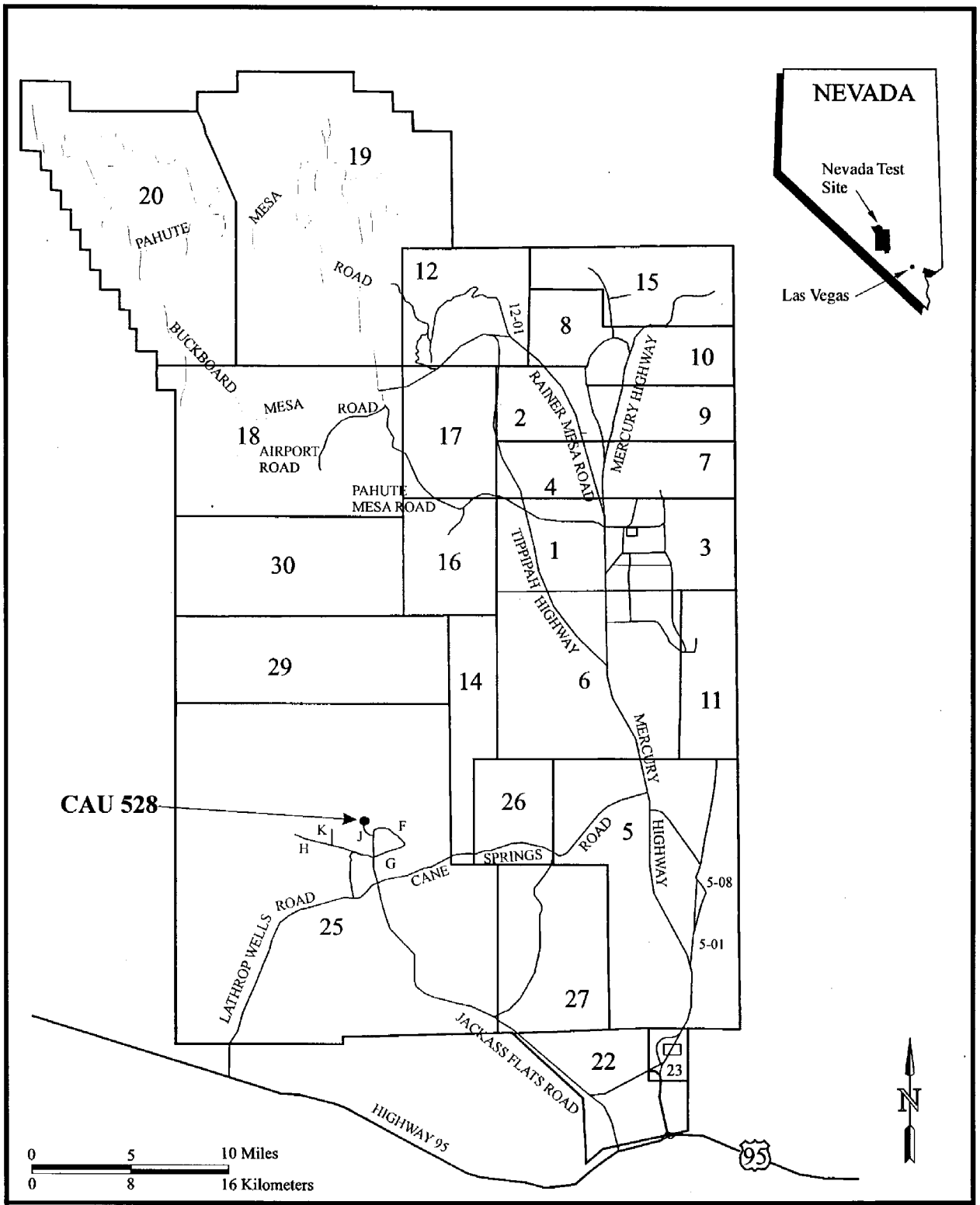

FIGURE 1
CAU 528 SITE LOCATION MAP

- Appendix D - Use Restriction Documentation
- Appendix E - Site Closure Photographs
- Library Distribution List

This report was developed using information and guidance from the following documents:

- CAP for CAU 528 (NNSA/NSO, 2005)
- Industrial Sites Quality Assurance Project Plan (QAPP) (U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office [NNSA/NV], 2002)

1.3.1 Data Quality Objectives

The data quality objectives (DQOs) used for the closure of CAU 528 were presented in the Corrective Action Investigation Plan (CAIP) (NNSA/NSO, 2003) and are included as Appendix A of this report.

A single conceptual site model (CSM) was developed and presented in the approved CAIP (NNSA/NSO, 2003). The CSM was based on historical documentation and previous analytical results that indicate that PCBs are present in the surface and shallow subsurface. The two suspected sources of contamination are leaking transformers and dust suppression activities conducted throughout the area.

The CSM was found to be consistent with the actual site conditions. Soil samples met the data requirements identified in the DQOs, and the primary CSM was confirmed.

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2.0 CLOSURE ACTIVITIES

This section details the specific closure activities completed during the closure of CAU 528, approved deviations from the CAP, the schedule of completed activities, and the final site plan.

2.1 DESCRIPTION OF CORRECTIVE ACTION ACTIVITIES

Closure activities were conducted from May 2006 through July 2006. The following sections detail the activities completed during the closure of CAU 528. Photographs in Appendix E of this report document the site conditions before and after corrective actions were implemented.

2.1.1 Preplanning and Site Preparation

Closure activities for CAU 528 were completed using the NDEP-approved CAP (NNSA/NSO, 2005). Prior to site closure activities, the following documents were prepared:

- National Environmental Policy Act Checklist
- Site-Specific Health and Safety Plan
- Field Management Plan
- NNSA/NSO Real Estate/Operations Permit
- Work control packages
- Sampling and Analysis Plan

2.1.2 Excavation of Impacted Soil

A total of approximately 9.5 cubic yards (yd^3) of soil impacted with PCBs above the TSCA action level of 25 mg/kg was excavated from two locations in Area 7 (Area 7A and Area 7B) and packaged in B25 boxes. To access the impacted soil at Area 7B, a small concrete pad was removed and disposed as sanitary waste at the Area 9 U10c Sanitary Landfill. The excavated soil was sampled, and the sample results showed that the concentration of PCBs in the waste was less than the NTS Area 9 U10c Sanitary Landfill waste acceptance limit of 50 mg/kg. Therefore, the soil was disposed as sanitary waste at the Area 9 U10c Sanitary Landfill.

2.1.3 Collection of Verification Soil Samples

After the impacted soil was removed, soil verification samples were collected from the two excavations. The sample results verified that the concentration of PCBs in the remaining soil was below the TSCA action level of 25 mg/kg, and the areas were backfilled. Figure 2 shows the verification sample locations.

2.1.4 Implementation of Use Restrictions

Soil containing concentrations of PCBs above 1 mg/kg and/or TPH above 100 mg/kg was closed in place with administrative controls. UR warning signs were installed around the perimeters of the impacted soil at Areas 1 through 6 and Areas 8 through 12, and URs were implemented. Area 7 lies within the Area 11 UR boundary. Figure 3 shows the boundaries of the UR areas.

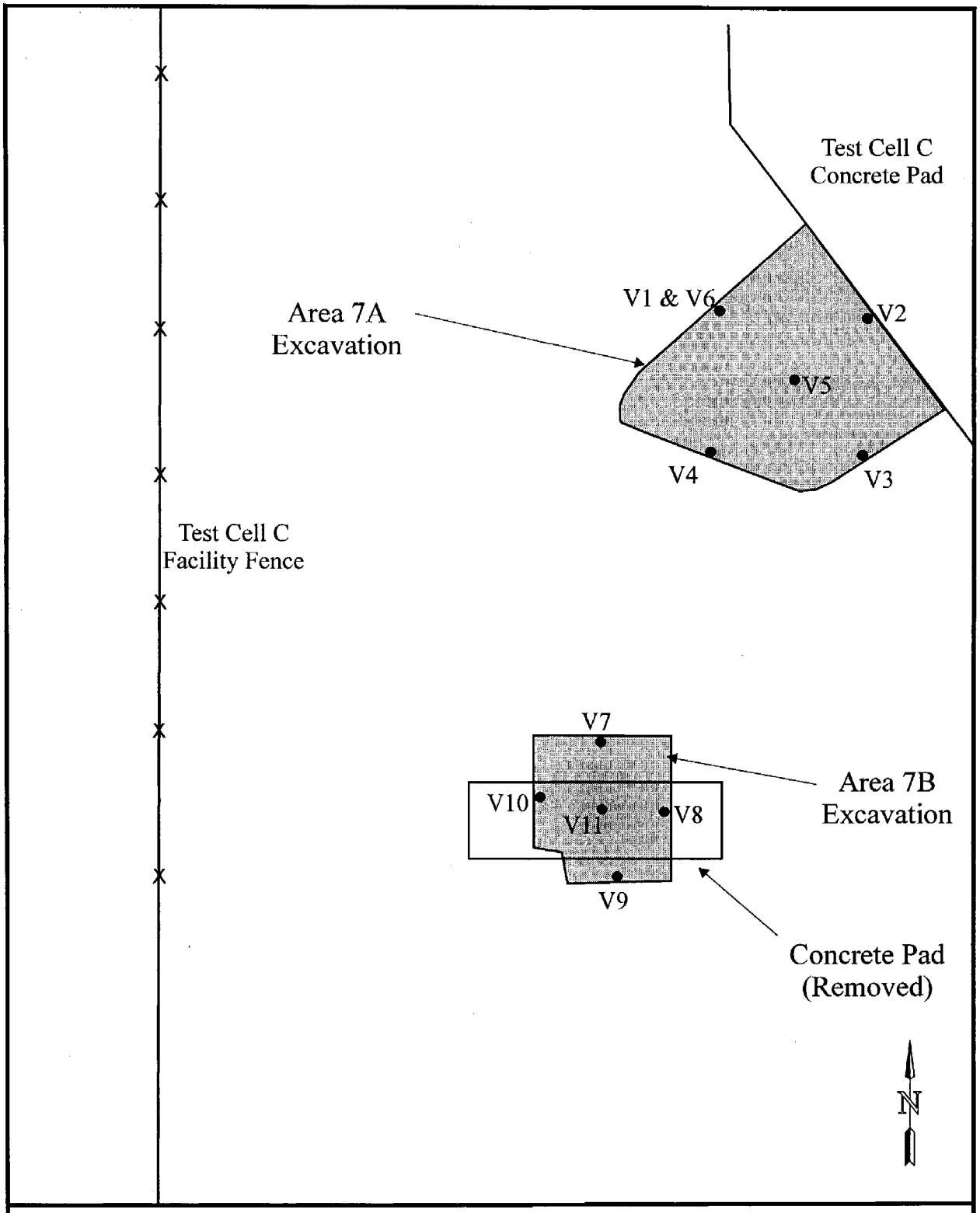

FIGURE 2
CAS 25-27-03 VERIFICATION SAMPLE LOCATIONS

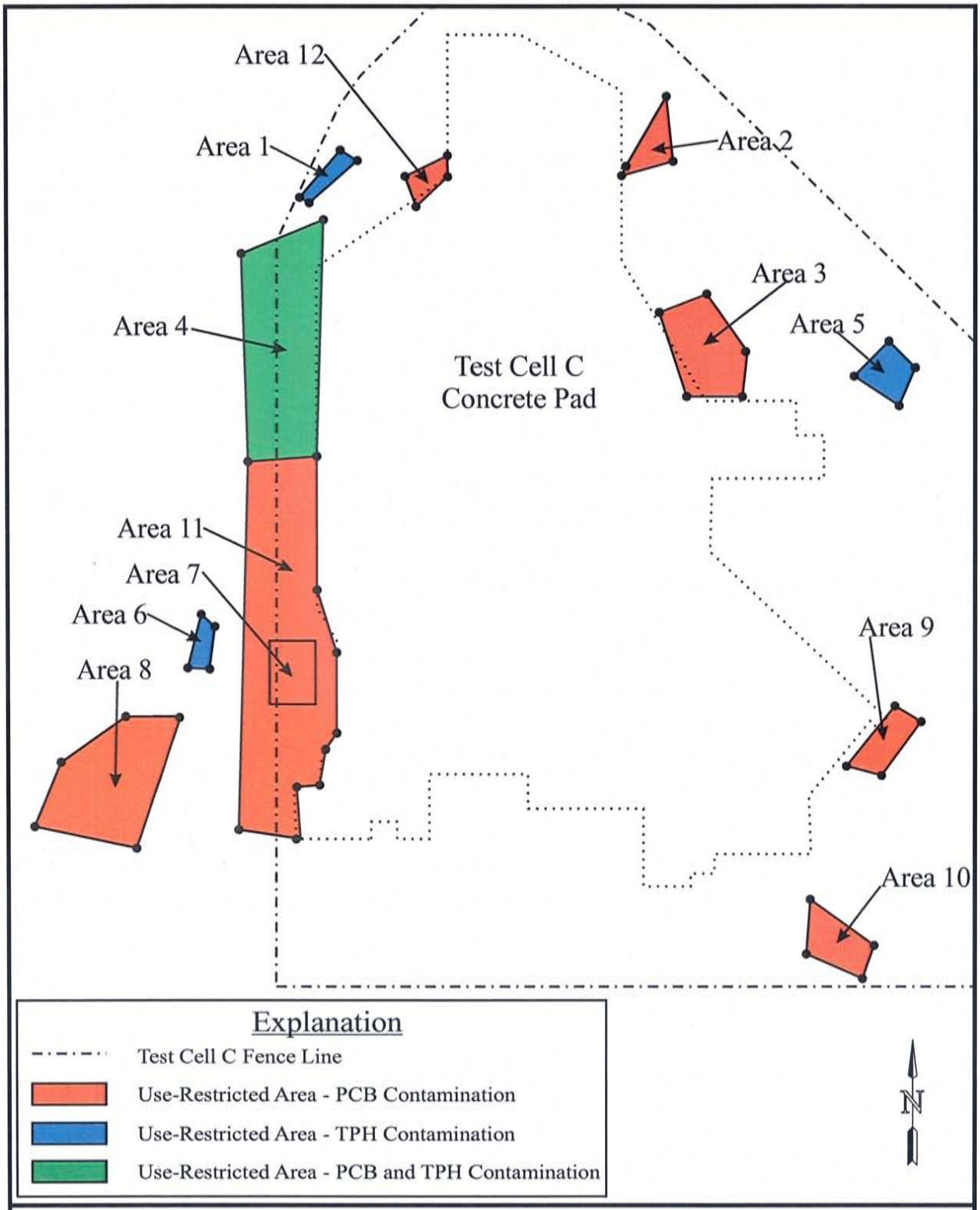

FIGURE 3
CAS 25-27-03 USE RESTRICTION BOUNDARIES

2.1.5 Transport and Disposal of Excavated Soil

After receipt of the waste characterization sample results, the waste was transported to the Area 9 U10c Sanitary Landfill.

2.2 DEVIATIONS FROM THE CAP AS APPROVED

Closure activities followed the approach specified in the approved CAP (NNSA/NSO, 2005), and no deviations from the CAP occurred during field closure activities.

2.3 CORRECTIVE ACTION SCHEDULE AS COMPLETED

The closure activities began in May 2006 and were completed in July 2006. Details of the closure field activities schedule are provided in Table 1.

TABLE 1. CAU 528 CLOSURE ACTIVITIES SCHEDULE

ACTIVITY	START DATE	END DATE
Mobilization and Site Setup	May 11, 2006	May 15, 2006
Excavation of Impacted Soil	May 16, 2006	May 18, 2006
Collection of Verification Soil Samples	May 18, 2006	May 22, 2006
Implementation of URs	May 22, 2006	May 23, 2006
Transport and Disposal of Excavated Soil	July 20, 2006	July 20, 2006

2.4 SITE PLAN/SURVEY PLAT

CAS 25-27-03 was closed in place with administrative controls (i.e., UR implemented). A figure showing the locations of the surveyed points delineating the UR areas is included in Appendix D of this report.

3.0 WASTE DISPOSITION

This section describes the waste generated during closure activities and its final disposition. All waste was characterized and managed according to federal and state regulations and U.S. Department of Energy orders. Waste disposition documentation is included in Appendix C of this report.

3.1 WASTE MINIMIZATION

Standard industry waste minimization practices were used throughout the course of closure activities.

3.2 CONTAINER MANAGEMENT

End-dumps were used to transport the removed concrete pad to the Area 9 U10c Landfill. B25 boxes were used to store and transport the excavated soil. All waste containers were inspected prior to use to verify that they were in good condition (i.e., no leaks, rust, or dents). Containers were closed while stored unless waste was being added or removed. They were also handled in such a manner that the integrity of the containers was not compromised.

3.3 WASTE CHARACTERIZATION

Waste streams were characterized according to the CAU 528 CAP (NNSA/NSO, 2005). Eight waste characterization samples were collected (four from each B25 box), sealed with a custody seal, cooled to 4° Celsius, and logged onto a chain of custody. The waste characterization sample results are summarized in Table 2, and the laboratory result summaries are included in Appendix B of this report. The concentration of PCBs in the waste was less than the NTS Area 9 U10c Sanitary Landfill waste acceptance limit of 50 mg/kg. Therefore, the soil was disposed as sanitary waste at the Area 9 U10c Sanitary Landfill.

3.4 WASTE STREAMS AND DISPOSAL

Waste streams generated during closure activities at CAU 528 included non-hazardous sanitary waste. Waste disposition documentation is included in Appendix C of this report.

3.4.1 Sanitary Waste

A total of approximately 14.5 yd^3 of sanitary waste was generated during closure activities at CAU 528. Approximately 5 yd^3 of this waste consisted of the concrete pad, and approximately 9.5 yd^3 of this waste consisted of excavated soil. The soil was determined to be sanitary waste based on waste characterization sample results. Sanitary waste was transported to the NTS Area 9 U10c Sanitary Landfill for disposal.

TABLE 2. CAU 528 WASTE CHARACTERIZATION SAMPLE RESULTS[A]

DATE COLLECTED	SAMPLE DELIVERY GROUP	SAMPLE IDENTIFICATION NUMBER	PCBs (mg/kg)	TCLP Metals (mg/L)	Gamma Spectroscopy, Isotopic Uranium, and Isotopic Plutonium
05/18/2006	V2685 (non-radiological) and V2686 (radiological)	SWMHZ00213	Arochlor-1262 = 4.6	Arsenic = 0.031 Barium = 0.30	<PALs
		SWMHZ00214	Arochlor-1262 = 0.48	Barium = 0.22	<PALs
		SWMHZ00215	Arochlor-1262 = 0.26	Arsenic = 0.040 Barium = 0.18	<PALs
		SWMHZ00216	Arochlor-1262 = 5.8	Barium = 0.15	<PALs
		SWMHZ00217	Arochlor-1262 = 0.03	Barium = 0.19	<PALs
		SWMHZ00218	Arochlor-1262 = 0.84	Arsenic = 0.027 Barium = 0.19	<PALs
		SWMHZ00219	Arochlor-1262 = 0.11	Arsenic = 0.028 Barium = 0.14	<PALs
		SWMHZ00220	Arochlor-1262 = 0.26	Barium = 0.17	<PALs

[A] Only the detectable sample results are reported here.

mg/kg = milligrams per kilogram
mg/L = milligrams per liter
PALs = preliminary action levels
PCBs = polychlorinated biphenyls
TCLP = Toxicity Characterization Leaching Procedure

4.0 CLOSURE VERIFICATION RESULTS

To verify that the clean-up criteria were fulfilled, soil verification samples were collected and analyzed for PCBs. The results showed that the concentration of PCBs remaining in the soil was below the TSCA action level of 25 mg/kg. Figure 2 shows the verification sample locations. The sample results are summarized in Table 3, and the laboratory result summaries are included in Appendix B of this report.

4.1 DATA QUALITY ASSESSMENT

Accurate and defensible analytical data were collected to verify that the closure standards were met. The following sections describe the quality assurance (QA)/quality control (QC) procedures, data validation process, and a reconciliation of the primary CSM with actual findings during CAU 528 closure activities. More detail on the QA/QC procedures for CAU 528 can be found in the CAU 528 CAP (NNSA/NSO, 2005).

4.1.1 Quality Assurance/Quality Control Procedures

Verification samples were collected with pre-cleaned disposable polyethylene scoops, placed in appropriately labeled sample containers, and secured with custody seals. All samples were labeled with a unique sample number, placed on ice, and transported under a chain of custody. Standard QA/QC samples were collected (i.e., 1 blind duplicate per 20 samples and 1 rinsate blank sample per site). Samples were analyzed by offsite laboratories. Analytical results were validated at the laboratory using stringent QA/QC procedures, including matrix spike/matrix spike duplicates, spiked surrogate recovery analysis, verification of analytical results, and data quality indicator requirements. Detailed information regarding the QA/QC program can be found in the Industrial Sites QAPP (NNSA/NV, 2002).

4.1.2 Data Validation

Data validation was performed according to the Industrial Sites QAPP (NNSA/NV, 2002), which is based on the U.S. Environmental Protection Agency (EPA) functional guidelines for data quality (EPA, 1994, 1999). Data were reviewed to ensure that samples were appropriately processed and analyzed, and that the results are valid. All sample data were internally validated by qualified personnel at the Tier I and Tier II levels. No anomalies were discovered in the data that would discredit any of the sample results. While only summary laboratory QC data for verification samples are included in Appendix B of this report, the complete data set, including validation reports for verification samples, is maintained in the project files and is available upon request.

4.1.3 Conceptual Site Model

The CSM was developed and presented in the approved CAIP (NNSA/NSO, 2003). The CSM was based on historical documentation and previous analytical results that indicated that PCBs were present in the surface and shallow subsurface. The two suspected sources of contamination are leaking transformers and dust suppression activities conducted throughout the area. No variations to the CSM were identified during closure activities.

TABLE 3. CAU 528 SOIL VERIFICATION SAMPLE RESULTS

DATE COLLECTED	SAMPLE DELIVERY GROUP	SAMPLE IDENTIFICATION NUMBER	PCBs (mg/kg)
05/22/2006	V2684	252703-V01	Arochlor-1262 = 1.5
		252703-V02	Arochlor-1262 = 7.2
		252703-V03	Arochlor-1262 = 0.4
		252703-V04	Arochlor-1262 = 1.9
		252703-V05	Arochlor-1262 = 6.2
		252703-V06	Arochlor-1262 = 0.05
		252703-V07	Arochlor-1262 = 1.1
		252703-V08	Arochlor-1262 = 0.03
		252703-V09	Arochlor-1262 = 0.01
		252703-V10	Arochlor-1262 = 0.4
		252703-V11	Arochlor-1262 = 2.5
		252703-R1 (Rinsate Blank)	ND

mg/kg = milligrams per kilogram
ND = not detected above minimum reporting limits
PCBs = polychlorinated biphenyls

4.2 USE RESTRICTION

CAS 25-27-03 consists of 12 areas impacted with TPH and/or PCBs. At Areas 1 through 6 and Areas 8 through 12, UR warning signs were posted to warn against intrusive activity according to the FFACO Use Restriction Posting Guidance (FFACO, 2003). Area 7 lies within the UR boundary of Area 11. Figure 3 shows the boundaries of the UR areas. The "CAU Land-Use Restriction Information" form and a figure showing the locations of the surveyed points delineating the UR areas are included in Appendix D of this report. Annual site inspections will be required to ensure that the signs are in good repair and that the UR has been maintained. Details on the post-closure requirements for this CAS are included in Section 5.2.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The following site closure activities were performed at CAU 528:

- Removed a concrete pad and a total of approximately 9.5 yd^3 of soil impacted with PCBs and disposed as sanitary waste
- Collected verification samples from the remaining soil, and backfilled the excavations
- Implemented URs

5.2 POST-CLOSURE REQUIREMENTS

Inspections will be performed on an annual basis at CAS 25-27-03 for the first 5 years and once every 5 years thereafter, for a total of 30 years. The first inspection will take place in calendar year 2007. Inspections will consist of visual observations to verify that the signs are in good repair and that the UR has been maintained. The results of the inspection will be documented on a site inspection checklist and summarized in the annual combined NTS post-closure letter report. The letter report will include a discussion of observations, copies of the site inspection checklists, and any maintenance records. A copy of the annual letter report will be submitted to the NDEP.

If any maintenance and repair requirements are identified during the annual inspection of CAS 25-27-03, funding will be requested and the repairs scheduled. Any repair or maintenance performed at this site will be documented in writing at the time of the repair and included in the annual letter report.

5.3 RECOMMENDATIONS

Since closure activities for CAU 528 have been completed following the NDEP-approved CAP (NNSA/NSO, 2005) as documented in this report, NNSA/NSO requests the following:

- A Notice of Completion be provided by NDEP to NNSA/NSO for the closure of CAU 528.
- CAU 528 be transferred from Appendix III to Appendix IV, "Closed Corrective Action Units," of the FFACO (FFACO, 1996).

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6.0 REFERENCES

EPA, see U.S. Environmental Protection Agency.

Federal Facility Agreement and Consent Order. 1996 (as amended). Agreed to by the state of Nevada, the U.S. Department of Energy, and the U.S. Department of Defense.

Federal Facility Agreement and Consent Order. 2003. *Use Restriction Posting Guidance.*

FFACO, see *Federal Facility Agreement and Consent Order.*

NNSA/NSO, see U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office.

NNSA/NV, see U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002. *Nevada Environmental Restoration Project Industrial Sites Quality Assurance Project Plan, Nevada Test Site, Nevada.* DOE/NV--372--REV 3. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2003. *Corrective Action Investigation Plan for Corrective Action Unit 528: Polychlorinated Biphenyls Contamination, Nevada Test Site, Nevada.* DOE/NV--892. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004. *Corrective Action Decision Document for Corrective Action Unit 528: Polychlorinated Biphenyls Contamination, Nevada Test Site, Nevada.* DOE/NV--960. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2005. *Corrective Action Plan for Corrective Action Unit 528: Polychlorinated Biphenyls Contamination, Nevada Test Site, Nevada.* DOE/NV--1059. Las Vegas, NV.

U.S. Environmental Protection Agency. 1994. *Guidance for the Data Quality Objectives Process, EPA QA/G-4.* Washington, D.C.

U.S. Environmental Protection Agency. 1999. *Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA540/R-99/008.* Washington, D.C.

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APPENDIX A*

DATA QUALITY OBJECTIVES

* As presented and published in the approved *Corrective Action Investigation Plan for Corrective Action Unit 528: Polychlorinated Biphenyls Contamination, Nevada Test Site, Nevada*, 2003, DOE/NV--892. Las Vegas, NV. Only Appendix A.1 of the original report is included here.

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A.1 Seven-Step DQO Process for CAU 528 Investigation

The DQO process described in this appendix is a seven-step strategic planning approach based on the scientific method that is used to plan data collection activities at CAU 528, Polychlorinated Biphenyls Contamination. The DQOs are designed to ensure that the data collected will provide sufficient and reliable information to identify, evaluate, and technically defend the recommended corrective actions (i.e., no further action, closure in place, or clean closure). Existing information about the nature and extent of contamination at the CAS in CAU 528 is insufficient to evaluate and select preferred corrective actions; therefore, a CAI will be conducted.

The CAU 528 investigation will be based on the DQOs presented in this appendix as developed by representatives of the NDEP and the NNSA/NSO. The seven steps of the DQO process developed for CAU 528 and presented in Sections A.1.2 through A.1.8 were developed based on the CAS-specific information presented in Section A.1.1 and in accordance with *EPA Guidance for Quality Assurance Project Plans EPA QA/G-5* (EPA, 2002a). This document identifies and references the associated EPA Quality System Document for DQOs entitled *Data Quality Objectives for Hazardous Waste Site investigation EPA QA/G-4HW* (EPA, 2000), upon which the DQO process presented herein is based.

A.1.1 CAS-Specific Information

Corrective Action Unit 528 consists of one CAS, CAS 25-27-03, Polychlorinated Biphenyls Contamination, located in an area adjacent to TCC in Area 25 of the NTS as shown in Figure A.1-1. Various nuclear reactor tests were conducted at TCC between 1959 and 1973. Although nuclear rocket engine testing ceased in 1973, various experiments and activities were conducted at TCC until 1977 when the facility was "mothballed." The following presents a summary of the history of the CAS.

Physical Setting and Operational History - Corrective Action Unit 528 was created to address a release of PCBs first identified during the CAI of CAU 262. Analytical results for soil collected during the CAI for CAU 262, CAS 25-04-07, PCBs were detected above the minimum reporting limits, and at some locations above the PALs, in surface soil samples collected from overburden at the TCC Building 3210 sanitary leachfield. This leachfield is located on the west edge of TCC. The

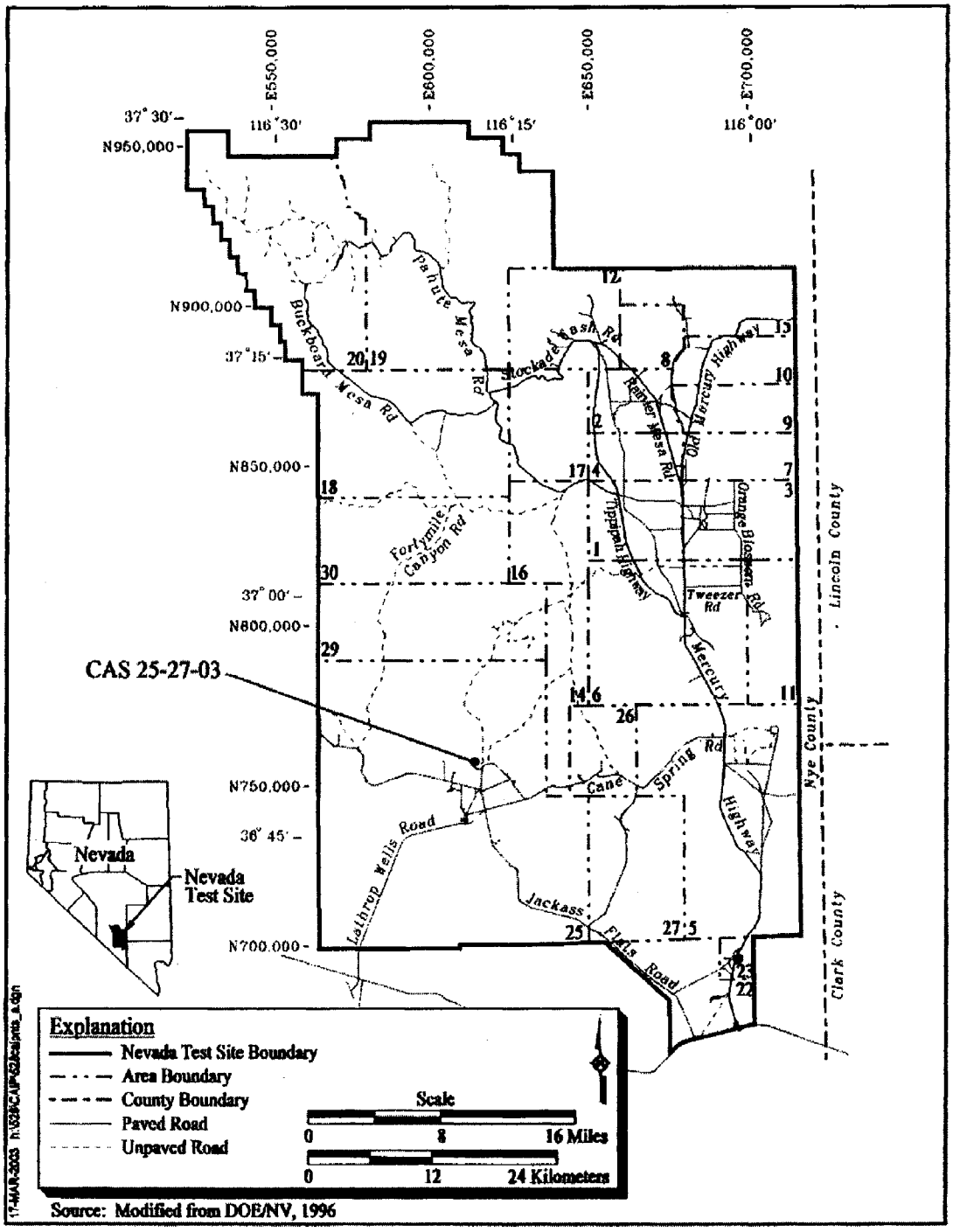

Figure A.1-1
CAU 528, CAS 25-27-03 Location Map

PCB contamination was not attributed to the septic system (DOE/NV, 2001). CAU 528 and CAS 25-27-03 were created in June 2001 to accommodate the corrective action process for this contamination.

During an August 29, 2002, PA site visit to CAS 25-27-03, Shaw identified two areas of potential environmental concern other than the soils within the CAS: a transformer pad and a small earthern mound located approximately 30 ft north of the transformer pad. Another smaller concrete pad is present near the transformer pad and is surrounded by yellow and orange fencing.

As part of the PA for CAS 25-27-03, Shaw collected surface soil samples in the vicinity of TCC in November and December 2002. Results from this sampling indicated the presence of PCBs throughout the area. Based on this information, CAS 25-27-03 includes Substation #3, where PCB containing transformers installed in 1961 were located, the earthern berm approximately 30 ft north of the transformer pad, and the surface and shallow subsurface soils contiguous to the TCC concrete pad. The CAS 25-27-03 includes the area adjacent to the TCC west to Topopah Wash and the soil within the fenced area of TCC to the north, east, and south. Figure A.1-2 shows the CAS 25-27-03 boundary based on current understanding.

Sources of Potential Contamination - Two potential sources of the PCB contamination have been identified. First, it is known that oil, potentially containing PCBs, was used in the past for dust suppression during construction and operational activities at the NTS. In addition, the use of oil for controlling wind erosion is known to have occurred in association with the remediation efforts conducted as a result of the Kiwi TNT Excursion and the Phoebus 1A reactor accident at TCC (Tinney, 2001). Potential residual PCB soil contamination within Topopah Wash resulting from the Kiwi TNT Excursion and other testing and subsequent remediation activities are being addressed under CAU 529. However, the areas outside the wash but within the fenced boundary of TCC and an area immediately west of TCC outside of the fenced boundary will be addressed during the CAS 25-27-03 investigation.

The second potential source of PCBs in the surface and shallow subsurface soil are the PCB-containing transformers once located on the concrete pad at Substation #3. Engineering drawings show that three 100 kVA, oil filled, self-cooling transformers were installed at Substation #3 1961. Because of their insulating and nonflammable properties, PCBs were widely

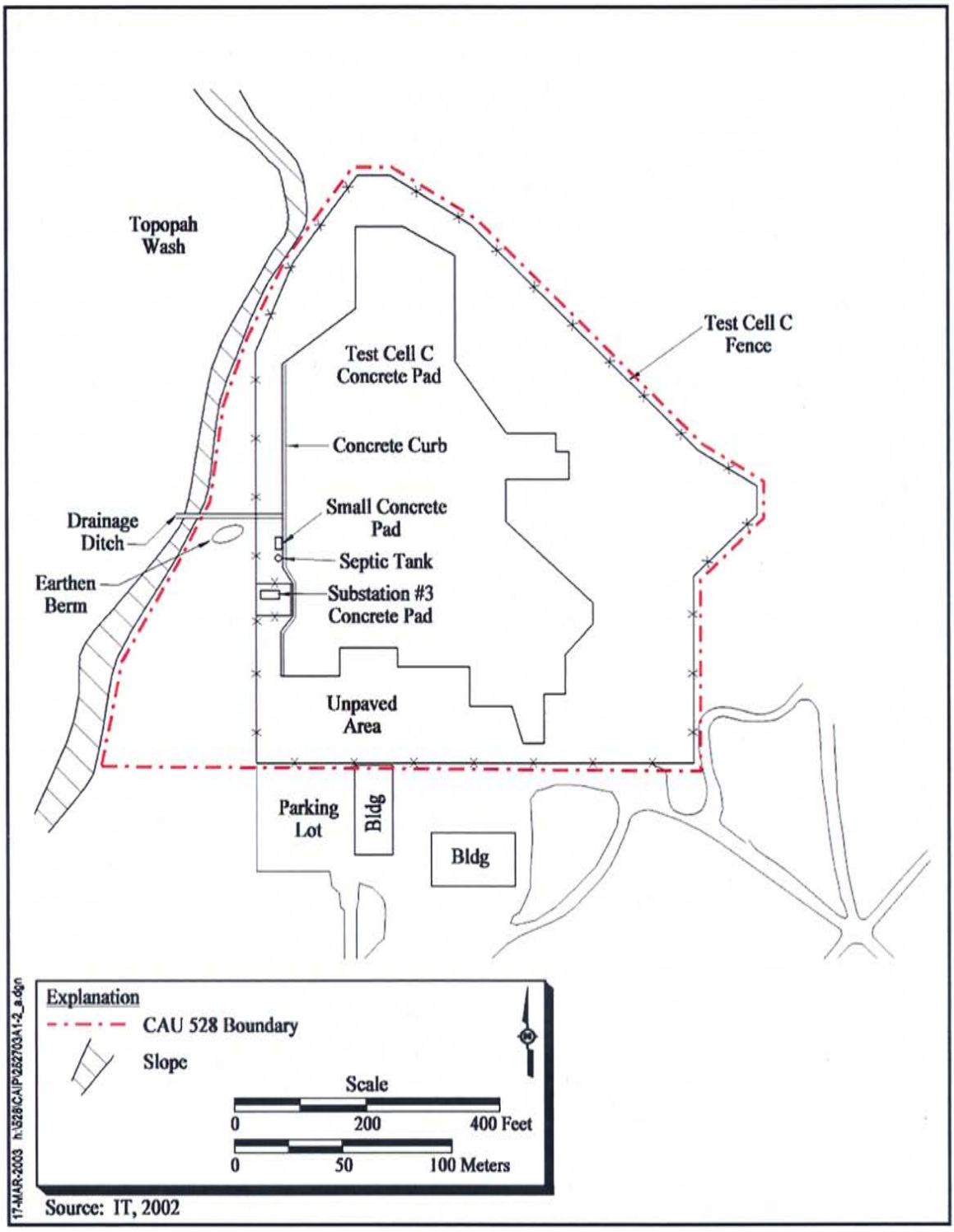

Figure A.1-2
CAU 528, CAS 25-27-03 Boundary

used as coolants in transformers before 1972. It is possible that a leak from, or a catastrophic failure of, one or more of the transformers may have occurred, although no documentation has been identified to confirm this possibility. The transformers have been removed from the pad, but the date of removal is unknown.

Previous Investigation Results - Analytical results for soil collected at CAS 25-04-07 showed PCBs to be present above the minimum reporting limits in soil samples collected from and near the leachfield overburden. Four samples exceeded the minimum reporting limits for Aroclor-1016, between 0 and 2 ft bgs, but none exceeded the PAL of 740 µg/kg. Twenty samples exceeded the minimum reporting limits for Aroclor-1260 between 0 and 6 ft bgs. Of the 20 total samples, 9 surface and 1 subsurface soil sample contained concentrations of Aroclor-1260 that exceeded the PAL. Of these samples, the highest concentration of PCBs (57,000 µg/kg Aroclor-1260) was detected in a surface soil sample near the TCC concrete pad (DOE/NV, 2001).

Soil sampling results for other CAU 262 CASs in the TCC area, indicate that PCB contamination is not widespread and is not consistent with sampling results for CAS 25-04-07. However, it must be noted that most of the soil samples for other CASs in the TCC area were collected from the subsurface. Only one soil sample, TAL09A06, taken at CAU 262, CAS 25-04-06, Septic Systems A and B, had a PCB result that exceeded minimum reporting limits, but the concentration was less than the PAL. This sample contained Aroclor-1254 between 6.25 and 6.75 ft bgs (DOE/NV, 2001).

In support of the November 2002 PA for CAU 528, exploratory surface soil samples were collected in the vicinity of the Substation #3 concrete pad and CAU 262, CAS 25-04-07, on the west side of TCC. The locations are shown in Figure A.1-3. These samples were analyzed for PCBs, TPH-DRO, TPH-GRO, VOCs, SVOCs, pesticides, radionuclides, RCRA metals, and beryllium. The results showed that Aroclor-1260 was present in the soil at concentrations ranging from 460 µg/kg to 13,000 µg/kg. These data show that the PCB contamination extends north, south, and west of the Substation #3 pad along the west side of the TCC concrete pad. The PCB concentrations in all but two of the samples exceeded the PAL. Total lead also was detected at 140 mg/kg at one location. Other metals, radionuclides, m- and p-xylenes, ethylbenzene, and phthalates also were detected at concentrations above the minimum reporting limits in various samples. The radionuclides and metals were present in most of the soil samples, while the VOCs and SVOCs were detected in only three of

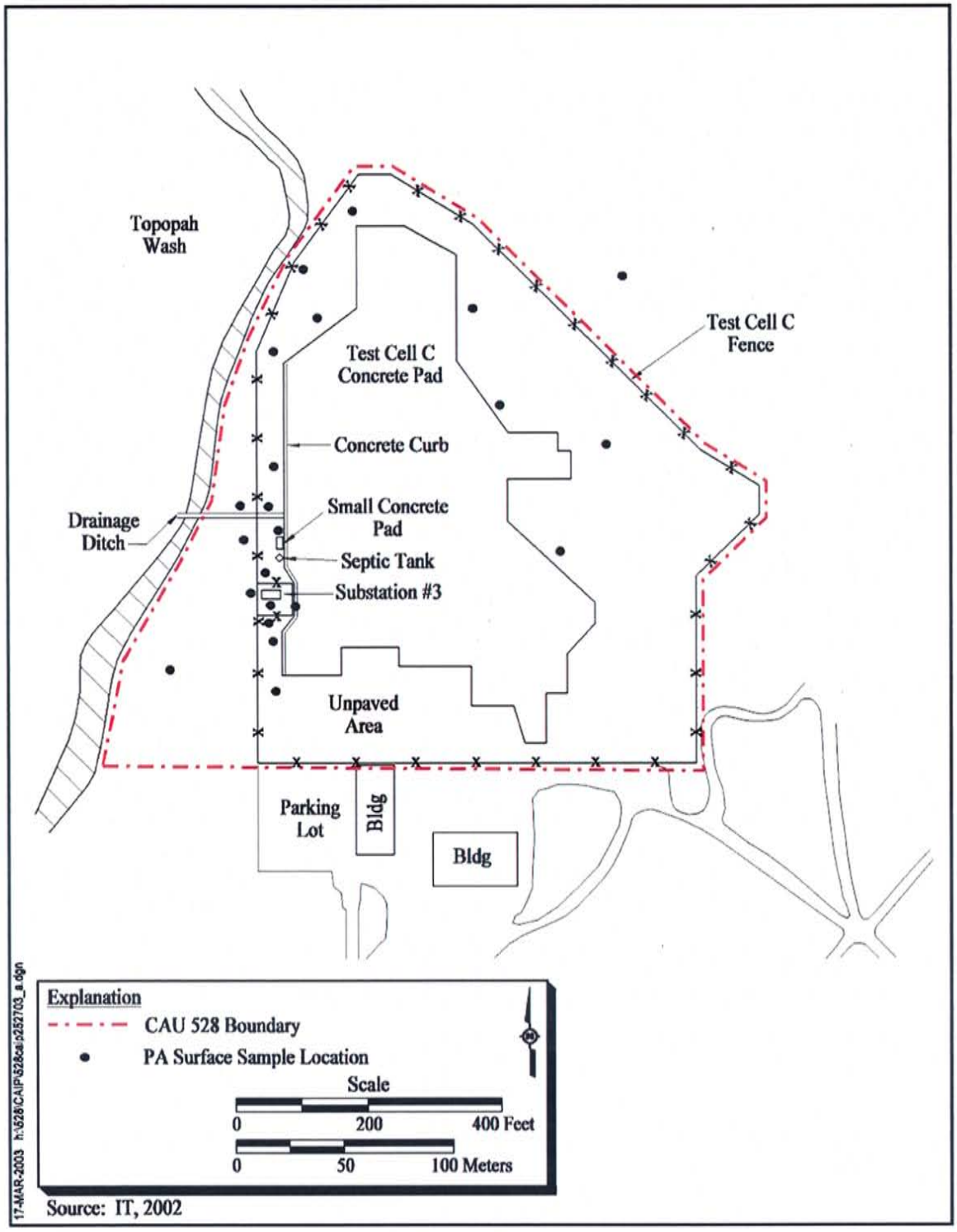

Figure A.1-3
CAU 528, CAS 25-27-03 Preliminary Assessment Surface Soil Sampling Locations

the samples collected north of Substation #3 near the drainage ditch leading from the TCC concrete pad to Topopah Wash. The PCB concentrations adjacent to Substation #3 decrease with distance from the pad; however, concentrations again increase north of the pad adjacent to the previously mentioned drainage ditch leading from TCC to Topopah Wash. This suggests that the PCBs in surface soil are more extensive than originally suspected and probably are not solely associated with the Substation #3 transformer pad.

Because results from the November 2002 sampling indicated PCB contamination was potentially more widespread than initially indicated, additional surface soil samples were collected in December 2002 and also were analyzed for the full suite of parameters mentioned previously. These samples were collected from the unpaved area along the western, northern, and eastern sides of TCC (Figure A.1-3) and were located in areas that showed evidence of stained soil in historical aerial photographs. The data confirmed that PCB contamination is more widespread and extends along the edge of the TCC pad north of the original area of concern, and also in a separate area along the northeast side of the TCC pad. Additional information concerning these sampling events is included in the CAIP.

Potential Contamination - Contaminants suspected of being present at CAS 25-27-03 are PCBs metals, and TPH. The VOCs and SVOCs also are suspected of being present because the PA sampling identified minor concentrations of these chemicals in the surface soil. The scope of this investigation is to determine the nature and extent of organic and inorganic contamination associated with the dust suppression activities that took place at TCC and the potential release of oil and PCBs from the Substation #3 transformers.

Radiological contamination resulting from the Kiwi TNT Excursion, Phoebus 1A accident, and other testing conducted at TCC is outside of the scope of CAU 528. Enough data on radioactivity have already been obtained at CAS 25-27-03 to satisfy health and safety planning needs. Radiological analysis may be required to support waste management decisions and IDW disposal. However, these radiological data are not intended to guide the identification and delineation of contamination within CAS 25-27-03.

A.1.2 Step 1 – State the Problem

This initial step of the DQO process identifies the planning team members and decisionmakers, describes the problem that has initiated the CAU 536 CAI, and develops the CSM.

A.1.2.1 Planning Team Members

The DQO planning team consists of representatives from NDEP, NNSA/NSO, Shaw, and Bechtel Nevada (BN). The primary decision-makers include NDEP and NNSA/NSO representatives. Table A.1-1 lists representatives from each organization in attendance at the February 4, 2002, DQO planning meeting.

Table A.1-1
DQO Meeting Participants

Participant	Affiliation
Sabine Curtis	NNSA/NSO
Terrylynn Foley	Shaw
John M. Fowler	Shaw
Orin L. Haworth	BN
Joe Hutchinson	SAIC
Lynn Kidman	Shaw
Barbara Quinn	SAIC
Robert Sobocinski	Shaw
Amber Steed	SAIC
Allison Urbon	BN
Alfred Wickline	SAIC
Jeanne Wightman	Shaw
John Wong	NDEP

BN – Bechtel Nevada
Shaw – Shaw Environmental, Inc.
NDEP – Nevada Division of Environmental Protection
NNSA/NSO – U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office
SAIC – Science Applications International Corporation

A.1.2.2 Describe the Problem

Corrective Action Unit 528 is being investigated because CAS 25-27-03 is located at the inactive and abandoned TCC that may not comply with the requirements of future land use.

The PCBs and related contaminants may be present at CAS 25-27-03 at concentrations that could potentially pose a threat to human health and the environment. The problem statement for CAU 528 is: "Existing information on the nature of other suspected contaminants and extent of PCBs and potential contamination is insufficient to evaluate and recommend corrective action alternatives for CAS 25-27-03."

A.1.2.3 Develop A Conceptual Site Model

A CSM describes the most probable scenario for current conditions at a CAS and defines the assumptions that are the basis for identifying appropriate sampling strategy and data collection methods. It is the basis for assessing how contaminants could reach receptors both in the present and future by addressing contaminant nature and extent, transport mechanisms and pathways, potential receptors, and potential exposures to those receptors. Accurate CSMs are important because they serve as the starting point for all subsequent inputs and decisions throughout the DQO process. Different CSMs for a single CAS or CAU are not dependent on the types of contaminants suspected, the geographic location, or being part of an engineered system, but rather the release mechanism and potential migration pathways that may influence the sampling strategies. Because the release mechanism and migration pathways are the same for the two potential sources, a single CSM has been developed for CAU 528, CAS 25-27-03.

An important element of a CSM is the expected fate and transport of contaminants, which infer how contaminants move through site media and where they can be expected in the environment. The expected fate and transport is based on distinguishing physical and chemical characteristics of the suspected contaminants and media. The PCBs with a high degree of chlorination (e.g., Aroclor-1248, -1254, and -1260) are resistant to biodegradation and have been shown to degrade very slowly in the environment. Contaminant characteristics include biodegradation potential, solubility, density, and affinity for nonmobile particles (adsorption). Media characteristics include permeability, porosity, hydraulic conductivity, total organic carbon content, and adsorption coefficients. In general,

contaminants with low solubility and high density can be expected to be found relatively close to release points. Contaminants with high solubility and low density are more susceptible to factors that can move them through various media; therefore, can be expected to be found further from release points.

A review of historical documentation and analytical results from CAU 262 and subsequent PA sampling indicate that PCBs are present in the surface and shallow subsurface at concentrations exceeding the PAL. There is no documented evidence of where this contamination originated. A CSM has been developed for CAS 25-27-03 using the historical background information, knowledge from studies at similar sites, and analytical data from the previous sampling efforts. The CSM is based on the two suspected sources of PCB contamination discussed in Section A.1.1: the failure or leaking of transformers at Substation #3, and dust suppression and wind erosion control conducted throughout the TCC area. The two suspected sources are termed transformer release and dust suppression, respectively. The CSM is shown in Figure A.1-4 and discussed in the following paragraphs.

If the Substation #3 transformers leaked or failed, contamination would have been released onto the concrete pad and then flowed onto the adjacent surface soil. Because of the condition of the pad (i.e., good integrity) PCBs and/or petroleum contamination associated with the transformers is not expected beneath the pad. This scenario predicts that if a release occurred as a result of the failure of the transformers, the location most likely to be contaminated would be the soil directly adjacent to the sides of the concrete pad. Contaminants would be expected to migrate away from the release point, primarily downward, and to a lesser degree horizontally. Analytical results from preliminary sampling conducted around and in the area of Substation #3 concrete pad in November 2002 confirmed the presence of PCBs in the surface soil at concentrations that exceed the PALs. However, the concentration gradient either horizontally or vertically is not known. Based on the physical and chemical properties of the PCBs, it is expected that contamination would be somewhat localized at the point of release and decrease with distance from the transformer pad.

Used oil potentially containing PCBs and metals may have been used to suppress dust and control wind erosion during the construction and operation of TCC. Petroleum products containing PCBs may have been sprayed onto the ground surface during discrete events. Reworking of the soil during

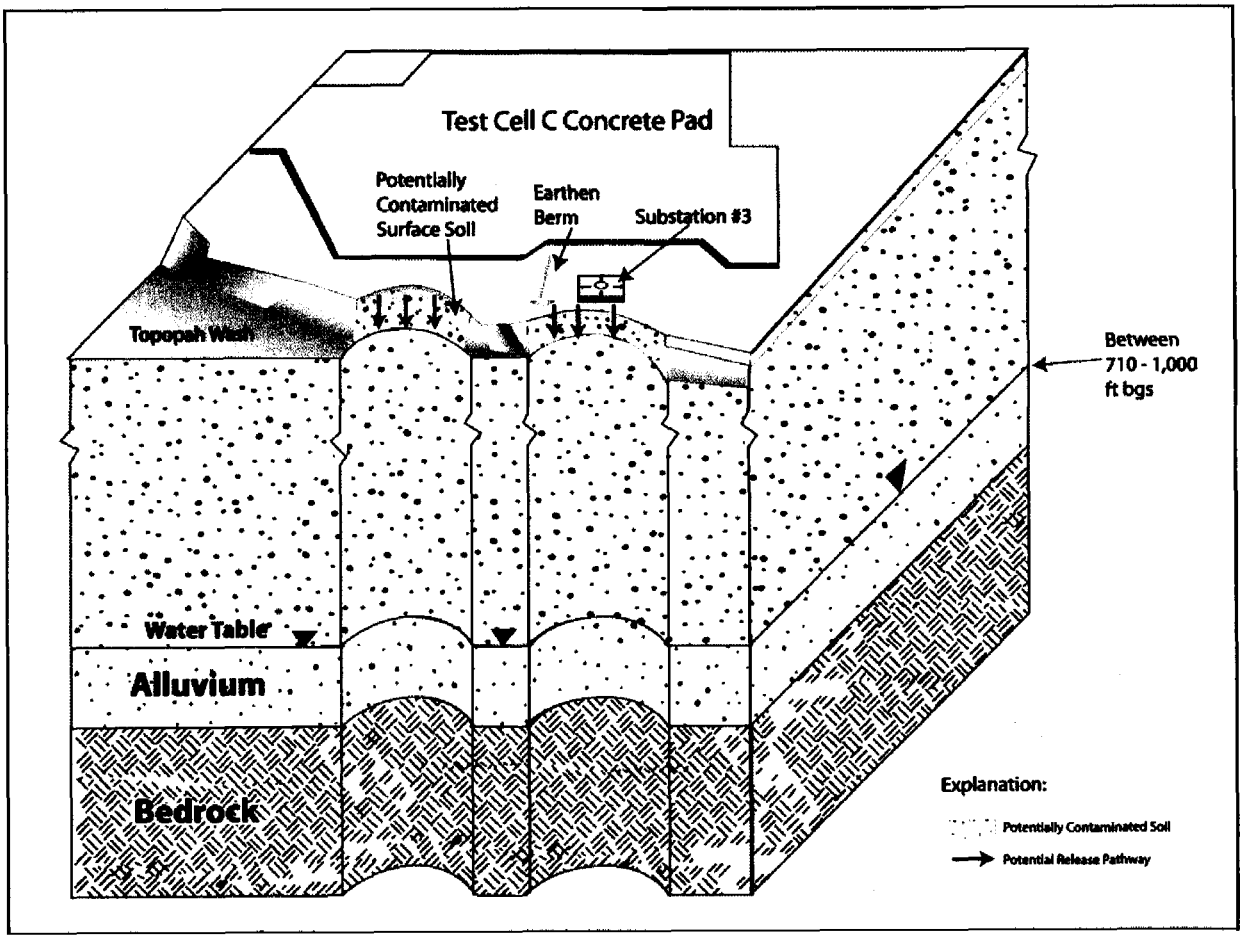

Figure A.1-4
CAU 528 Conceptual Site Model

TCC construction and operations could have physically transported contamination into shallow subsurface soil at some locations. Because the extent and frequency of the dust suppression activities is unknown, the potential contamination may appear to be randomly distributed throughout the site with no obvious source. The analytical results from the PA sampling support the theory that there are sources of PCB contamination other than the transformer release. Therefore, this scenario warrants further consideration. Shallow subsurface PCB contamination may have resulted from downward migration of the contaminated oil or, as discussed above, reworking of surface soils subsequent to the initial release. The CSM predicts that the concentration of contaminants would be highest in the surface soil without an obvious lateral concentration gradient to suggest a release point. However, in both scenarios, shallow subsurface contamination could be caused by the reworking of the surface soil subsequent to the release(s) of contamination.

Based upon the CSM, contamination found at CAS 25-27-03 would result from the failure of the transformers formerly located on a concrete pad at Substation #3 and/or direct application of oil containing PCBs on the surface soil. Insufficient records are available for the suspected source activities to specifically identify chemicals present in the soil. Therefore, COPC information is based upon previous sampling and analysis, limited historical documentation, interviews with current/former site employees, and site visits.

If additional areas or elements are identified during the CAI that go beyond the area or situation identified for investigation in the CSM, the situation will be reviewed and recommendations will be made to revise Step 4 (Define the Study Boundaries) of the DQO process and/or revise the sampling approach. The DQOs will be reviewed and any significant deviation from the planned approach will be presented to the decision makers for approval.

The following discussion of the CSM parameters provide additional details to supplement this model.

Exposure Scenario - The potential for exposure to contamination at the CAU 528 CAS is limited to industrial and construction workers as well as military personnel conducting training (DOE/NV, 1998). These human receptors may be exposed to COPCs through ingestion, inhalation, dermal contact (absorption) from soil and/or debris (e.g., equipment, concrete) due to inadvertent disturbance of these materials. The future land-use scenario limits uses of the CAU to various nonresidential uses (i.e., industrial uses) and include, defense and nondefense research, development, and testing activities (Table A.1-2).

Table A.1-2
Future Land-Use Scenarios for CAS 25-27-03 Within CAU 528

Land Use Zone	Zone Description
Research, Test, and Experiment Zone	This area is designated for small-scale research and development projects and demonstrations; pilot projects; outdoor tests; and experiments for the development, quality assurance, or reliability of material and equipment under controlled conditions. This zone includes compatible defense and nondefense research, development and testing projects and activities (DOE/NV, 1998).

Affected Media - For the dust suppression scenarios, the potentially affected medium is the surface and shallow subsurface soil throughout the CAS. Because of the unknown procedures employed for dust suppression around TCC, the area potentially affected is unknown. For a release from the transformers, the potentially affected media are the concrete pad, surface and subsurface soil near the Substation #3 pad.

Contamination/Release - Releases to the environment from the suppression of dust during operation or construction activities associated with TCC will be present in the surface or shallow subsurface soil. Under this scenario, the surface soil throughout the CAS would have been the most likely point of release to the environment; therefore, should contain the highest concentrations of the released constituents. Potential contaminant concentrations in the soil beyond the TCC concrete pad could be random with no obvious pattern and may also be found in shallow subsurface soils, if the PCBs and/or petroleum hydrocarbons migrated vertically or if physical mixing occurred during construction or operation activities at TCC. Because dust suppression would have been performed by applying discrete batches of waste oils, and the PCB concentration of individual batches would have varied, it is possible that the PCB contamination may be present in areas where individual batches of waste oil containing PCBs were applied rather than in "hot spots." Review of documentation including Los Alamos Scientific Laboratory (LASL) (1967) indicates that the pad was constructed in sections between 1961 and 1967.

For a transformer release, contaminants would be expected to be present on the substation pad and in the surface and shallow subsurface adjacent to the pad. The highest concentration of PCBs and petroleum hydrocarbons would be expected in the surface soil adjacent to the sides of the concrete pad. Again, physical mixing due to surface activities or vertical migration could distribute the contamination in shallow subsurface soil.

Transport Mechanisms - The degree of contaminant migration at this site is unknown, but it is assumed to be minimal based on the affinity of the PCBs and petroleum hydrocarbons for soil particles, and the low precipitation and high evapotranspiration rates typical of the NTS environment. Runoff could cause lateral migration of contaminants over the ground surface for both release scenarios. Contaminants may also have been transported by infiltration and percolation of precipitation through soil, which would serve as the primary driving force for downward migration.

Mixing of the surface soil as a result of grading or construction activities would also move the PCBs into deeper intervals. The migration of organic constituents (e.g., petroleum hydrocarbons, PCBs) can be controlled to some extent by their affinity for organic material present in soil. However, this mechanism is considered insignificant because of the lack of organic carbon in the desert soil around TCC. Migration of certain inorganic constituents (e.g., metals in waste oil) is controlled by geochemical processes, such as adsorption, ion exchange, and precipitation of solids from solution.

Because of the low volatility of the PCBs and other suspected contaminants, an airborne release subsequent to the initial contaminant release is not considered a significant release pathway. The main process of migration through the air would be through windblown dust. If PCBs, SVOCs, metals, or petroleum hydrocarbons adsorbed to the fine soil particles, a small amount of migration could be expected via the airborne pathway. This process could allow for the deposition of contaminants beyond the site boundaries. For all transport mechanisms, it would be expected that contaminant levels decrease with distance from the point of release.

Preferential Pathways - Preferential pathways for contaminant migration at CAS 25-27-03 are expected not to be present or have only had a minor impact on contaminant migration. The presence of relatively impermeable layers (e.g., caliche layers, concrete pads) modify transport pathways both on the ground surface and in the shallow subsurface. Small gullies, if present, could channelize runoff and increase lateral transport prior to infiltration. Rain may wash PCBs off the concrete pad onto the surrounding soil. Contamination could travel laterally to a small degree under both scenarios. Although the preferential pathways for contaminant migration will be considered in the development of sampling schemes and sampling contingencies discussed in the CAIP, primary consideration will be given to the release and transport mechanisms.

Lateral and Vertical Extent of Contamination - If contamination is present, it is expected to be confined to the surface and shallow subsurface at the site. Concentrations of contamination are expected to decrease with distance (both horizontally and vertically) from the release points. Surface migration may occur as a result of storm events when precipitation rates exceed infiltration (stormwater runoff). However, these events are infrequent. Surface migration is a biasing factor considered in the selection of sampling points. As stated previously, downward contaminant

transport is expected to be limited but is unknown because the quantities of hazardous material released is unknown.

Migration of contamination for the two release scenarios would be expected to be primarily downward, with horizontal migration to a much lesser extent. The lateral extent of contamination, due to dust suppression activities, would expected to extend over a larger area as a result of the deposition mechanism rather than as a result of lateral migration. Minor amounts of lateral migration may occur due to periodic stormwater runoff. The mixing of the soil at and near the surface also would influence the lateral and vertical extent of contamination.

Groundwater contamination is not considered a likely scenario at CAU 528, due to minimal precipitation, high evapotranspiration, strong attenuation of suspected contaminants in the soil, and significant depths to groundwater. For example, depths to groundwater in Area 25 wells have been recorded between 740 ft bgs at Well J-13 to 1,040.25 ft bgs at well J-11 (USGS, 2002).

A.1.3 Step 2 – Identify the Decision

Step 2 of the DQO process identifies the decisions statements and defines alternative actions. Also presented is this section is the decision logic for the entire process.

A.1.3.1 Develop Decision Statements

The primary problem statement is: Insufficient information is available concerning the nature of suspected contamination other than PCBs and extent of contamination released at CAS 25-27-03 to determine if there is an unacceptable risk to human health and the environment. Because existing information at this CAS is insufficient to resolve the problem statement, the following two decision statements have been established as criteria for determining the adequacy of the data collected during the CAI.

The Decision I statement is: "Is a contaminant other than PCBs present within CAS 25-27-03 at a concentration that could pose and unacceptable risk to human health and the environment?" Any contaminant detected at a concentration exceeding the corresponding PAL, as defined in Section A.1.4.2, will be considered a COC. The presence of a contaminant within this CAS is

defined as the analytical detection of a COC. Samples used to resolve Decision I are identified as Phase I samples.

The Decision II statement is: "If a COC is present, is sufficient information available to evaluate appropriate corrective action alternatives?" Sufficient information is defined as the data needs identified in this DQO process to include the lateral and vertical extent of the PCBs and all COCs within the CAS. Samples used to resolve Decision II are identified as Phase II samples.

A.1.3.2 Alternative Actions to the Decisions

For each decision identified in the previous section there is an alternate decision.

The alternate for Decision I is: If a COC other than PCBs is not present, further assessment of the CAS other than the delineation of the PCBs is not required. If a COC in addition to PCBs is present, resolve Decision II.

The alternate for Decision II is: If the extent of the PCBs and any other COC is defined in both the lateral and vertical direction, further assessment of the CAS is not required. If the extent of a COC is not defined, reevaluate site conditions and collect additional samples.

A.1.4 Step 3 – Identify the Inputs to the Decisions

This step identifies the information needed, determines sources for information, determines the basis for establishing action levels, and identifies sampling and analysis methods that can meet the data requirements. To determine if a COC is present other than PCBs, each sample result is compared to a PAL (Section A.1.4.2). If any sample result exceeds the PAL, then the CAS is advanced to Decision II (define the lateral and vertical extent) for that parameter. This approach does not use a statistical mean/average for comparison to the PALs, but rather a point-by-point comparison to the established screening criteria to identify COCs.

A.1.4.1 Information Needs and Information Sources

In order to determine if COC other than PCBs is present at CAS 25-27-03, sample data must be collected and analyzed following these two criteria: (1) samples must be collected in areas most

likely to be contaminated, and (2) the analytical suite selected must be sufficient to detect any contamination present in the samples. Biasing factors to support criteria #1 include:

- Previous sample results
- Documented process knowledge on source and location of release
- Field observations
- Potential runoff area from the TCC concrete pad
- Field screening data
- Experience and data from investigations of similar sites
- Professional judgement
- Radiological field screening results

In order to determine the extent of a COC for Decision II, Phase II samples will be collected from locations to bound the lateral and vertical extent. For Phase II sampling, analytical suites will only include those parameters that exceed PALs (i.e., COCs) in prior samples. The data required to satisfy the information needs for Decision II for each COC is a sample concentration that is below the corresponding PAL. Step-out locations will be selected based on the CSM, biasing factors, FSRs, and Phase I analytical results. When analytical results or other biasing factors suggest that the COC concentrations, at the step-out location(s), may still exceed the PAL, then an additional step-out distance may be used to define the lateral extent of contamination. If a location where the PAL is exceeded is surrounded by clean locations, then lateral step-outs may not be necessary. In that case, sampling may consist only of sampling from deeper intervals at or near the original location to determine the vertical extent of contamination. Vertical extent samples will be collected from depth intervals that will meet DQO objectives and in a manner that will conserve resources during possible remediation. Biasing factors to support these information needs may include the factors previously listed and Phase I analytical results. Sampling locations may be moved due to access problems, underground utilities, or safety issues; however, the modified locations must meet the decision requirements and criteria necessary to fulfill the information needs.

Table A.1-3 lists the information needs, the source of information for each need, and the proposed methods to collect the data needed to resolve Decisions I and II. The last column addresses the QA/QC data type and associated metric. The data type is determined by the intended use of the resulting data in decision making.

Table A.1-3
Information Needs to Resolve Decisions I and II
(Page 1 of 3)

Information Need	Information Source	Collection Method	Biasing Factors to Consider	Data Type/Metric
Decision I (Phase I): Determine if a COC is present. Criteria I: Samples must be collected in areas most likely to contain a COC.				
Source and location of release points	Process knowledge, historical documentation, and previous investigations of similar sites	Information documented in CSM and public reports – no additional data needed	None	Qualitative – CSM has not been shown to be inaccurate
	Field observations	Conduct site visits and document field observations	Visible evidence of contamination, topographic lows, gullies	Qualitative – CSM has not been shown to be inaccurate
	Aerial photographs	Review and interpret aerial photographs	Disturbed areas, visible evidence of contamination, location of possible sources	Semiquantitative - Sampling based on biasing criteria stipulated in DQO Step 3
	Field screening	Review and interpret FSRs	Bias sample locations/ intervals based on elevated FSRs	Semiquantitative - Sampling based on biasing criteria stipulated in DQO Step 3
	Existing analytical data	Review and interpret sampling results	Bias sample locations based on previous results	Semiquantitative - Sampling based on biasing criteria stipulated in DQO Step 3
Nature of contamination	Biased samples	Collect samples from locations/depths based on biasing factors	Send samples for quick-turnaround analysis to laboratory	Quantitative - Sampling based on quick-turnaround analytical results
	Biased samples	Collect samples from additional locations near CAS features	Worst-case locations such as edge of pad	Quantitative - Sampling based on CAS features

Table A.1-3
Information Needs to Resolve Decisions I and II
(Page 2 of 3)

Information Need	Information Source	Collection Method	Biasing Factors to Consider	Data Type/Metric
Decision I (Phase I): Determine if a COC is present. Criteria 2: Analyses must be sufficient to detect any COCs in samples.				
Identification of all potential contaminants	Process knowledge and previous investigations of similar sites; use analytical suite in Table A.1-4.	Information documented in CSM and public reports – no additional data needed; comprehensive analytical suite developed to account for uncertainty.	None	Qualitative – CSM has not been shown to be inaccurate
Analytical results	Data packages from biased samples	Appropriate sampling techniques and approved analytical methods will be used; MRLs are sufficient to provide quantitative results for comparison to PALs	None	Quantitative - Validated analytical results will be compared to PALs
Decision II (Phase II): Determine the extent of a COC. Criteria: Sample collection and analysis methods must be sufficient to bound extent of COC.				
Identification of applicable COCs	Data packages of Phase I samples	Review analytical results and compare to PALs to select COCs	None	Quantitative - Only COCs identified will be analyzed in future sampling events
Extent of Contamination	Field observations	Document field observations	Visible evidence of contamination	Qualitative - CSM has not been shown to be inaccurate
	Field screening	Conduct field screening using appropriate methods	Bias sample locations/ intervals based on FSRs	Semiquantitative - FSRs will be compared to field screening levels
	Step-out samples	Generate locations based on previous sampling results and biasing factors	Locations selected based on the initial sampling results for both horizontal and vertical sampling.	Semiquantitative - Sampling based on previous results and biasing factors
	Data packages of analytical results	Appropriate sampling techniques and approved analytical methods will be used to bound COCs; MRLs are sufficient to provide quantitative results for comparison to PALs	None	Quantitative - Validated analytical results will be compared to PALS to determine COC extent

Table A.1-3
Information Needs to Resolve Decisions I and II
(Page 3 of 3)

Information Need	Information Source	Collection Method	Biasing Factors to Consider	Data Type/Metric
Decision: Determine if sufficient information exists to characterize waste. Criteria: Analyses must be sufficient to allow disposal options to be accurately identified and estimated.				
Analytical results	Data packages of analytical results; Use analytical suite in Table A.1-4; Require TCLP if results are >20X TCLP limits or if PCB contamination exceeds 50 ppm	Appropriate sampling techniques and approved analytical methods will be used; MRLs and minimum detectable activities are sufficient to provide quantitative results for comparison to disposal requirements	Sufficient material must be available for analysis	Quantitative – Validated analytical results will be compared to disposal criteria

Data types are discussed in the following text. All data to be collected are classified into one of three measurement quality categories: quantitative, semiquantitative, and qualitative. The categories for measurement quality are defined below.

Quantitative Data

Quantitative data measure the quantity or amount of a characteristic or component within the population of interest. These data require the highest level of QA/QC in collection and measurement systems because the intended use of the data is to resolve primary decisions (i.e., Decision I or Decision II) and/or verifying closure standards have been met. Laboratory analytical data are generally considered quantitative.

Semiquantitative Data

Semiquantitative data indirectly measure the quantity or amount of a characteristic or component. Inferences are drawn about the quantity or amount of a characteristic or component because a correlation has been shown to exist between the indirect measurement and the results from a quantitative measurement. The QA/QC requirements on semiquantitative collection and measurement systems are high but not as rigorous as a quantitative measurement system. Semiquantitative data contribute to decision making but are not used alone to resolve primary

decisions. Field-screening data are generally considered semiquantitative. The data are often used to guide investigations toward quantitative data collection.

Qualitative Data

Qualitative data identify or describe the characteristics or components of the population of interest. The QA/QC requirements are the least rigorous for data collection methods and measurement systems. The intended use of the data is for information purposes, to refine conceptual models, and guide investigations rather than resolve primary decisions. This measurement of quality is typically assigned to historical information and data where QA/QC may be highly variable or not known. Professional judgement is often used to generate qualitative data.

Metrics provide a tool to determine if the collected data support decision making as intended. Metrics tend to be numerical for quantitative and semiquantitative data, and descriptive for qualitative data.

A.1.4.2 Determine the Basis for the Preliminary Action Levels

Industrial site and construction/remediation workers and military personnel (i.e., ground troops) may be exposed to contaminants through ingestion, inhalation, external (radiological), or dermal contact (absorption) of soil. Laboratory analytical results for soil will be compared to the following PALs to determine if COCs are present:

- EPA Region 9 Risk-Based PRGs for chemical constituents in industrial soils (EPA, 2002b)
- For detected COPCs without established PRGs, a similar protocol to that used by EPA Region 9 will be used in establishing an action level for those COPCs listed in IRIS (EPA, 2002c)
- Background concentrations for RCRA metals will be used instead of PRGs when natural background exceeds the PRG, as is often the case with arsenic on the NTS. Background is considered the mean plus two times the standard deviation of the mean for sediment samples collected by the Nevada Bureau of Mines and Geology throughout the Nevada Test and Training Range (NBMG, 1998; Moore, 1999).
- The TPH action limit of 100 ppm per the NAC 445A.2272 (NAC, 2002)

As discussed in Section A.1.1, the presence or extent of radiological contamination of soil within CAS 25-27-03 will not be addressed during the CAI.

A.1.4.3 Potential Sampling Techniques and Appropriate Analytical Methods

As discussed in Section A.1.4.1, the collection, measurement, and analytical methods will be selected so the results will be generated for the PCBs as well as all other potential contaminants at CAS 25-27-03. This effort will include field screening, soil sampling and quick-turnaround laboratory analysis to determine the presence of COPCs and extent of identified COCs.

As discussed in Section A.1.1, the extent of radiological contamination of soil within CAS 25-27-03 will not be addressed during the CAI. For CAS 25-27-03, source characterization sampling and analysis are the focus of the DQO process. However, to support the disposal of IDW and potential future cleanup waste management issues, samples submitted for laboratory analysis will also be analyzed for gamma-emitting radionuclides, and based on the results, samples may also undergo strontium-90 and isotopic uranium analysis (see Table A.1-4). The radiological parameters are not considered COPCs and will not be used to define the extent of PCB, metal, or organic contamination at CAU 528. However, waste characterization sampling and analysis has been included to support the decision-making process for waste management, and to ensure an efficient field program. Specific analyses required for the disposal of IDW are identified in Section 5.0 of the CAIP.

A.1.4.3.1 Field Screening

Field-screening activities may be conducted for the following analytes and/or parameters:

- Alpha and Beta/Gamma Radiation - a handheld radiological survey instrument or method, may be used based on the possibility that radiologically contaminated soil or concrete may be present CAS 25-27-03. If determined appropriate, on-site gamma spectrometry may also be used to screen samples.

- VOCs - a photoionization detector (PID), or and equivalent instrument or method, may be used to conduct headspace analysis because VOCs are a common concern at the NTS and have not been ruled out based upon process knowledge at CAU 528.

Based on the results of previous CAU investigations and common NTS practices, the aforementioned field-screening techniques may be applied during the Phase I and II sampling at CAS 25-27-03. These field-screening techniques will provide semiquantitative data that can be used to guide confirmatory soil sampling activities and waste management decisions.

A.1.4.3.2 Soil Sampling and Measurement Methods

Hand sampling, augering, direct-push, excavation, drilling, or other appropriate sampling methods will be used to collect soil samples. Sample collection and handling activities will only be conducted in accordance with approved procedures. It may be appropriate to use excavation in selected areas to determine if contaminated soil has been covered with clean fill.

A.1.4.3.3 Analytical Program

The analytical program for CAS 25-27-03 shown in Table A.1-4 has been developed based on the suspected-contamination information presented in Section A.1.1.

Table A.1-4
Analytical Program for CAU 528

Analyses[a]
Organics
Total Petroleum Hydrocarbons (DRO and GRO)
Polychlorinated Biphenyls (PCBs)
Volatile Organic Compounds (VOCs)
Semivolatile Organic Compounds (SVOCs)
Metals
Resource Conservation and Recovery Act Metals[b] and Beryllium
Radionuclides[c]
Gamma Spectrometry[d]
Isotopic Uranium
Strontium-90

[a]If the volume of material is limited, prioritization of the analyses will be necessary.
[b]May also include Toxicity Characteristic Leaching Procedure metals if sample is collected for IDW disposal or future waste management issues
[c]Radionuclides will only be analyzed in support of IDW disposal and future waste management issues.
[d]All submitted samples will be analyzed by gamma spectrometry, and selected samples also will be analyzed for strontium-90 and isotopic uranium

DRO = Diesel-Range Organics
GRO = Gasoline-Range Organics

Radionuclides have been included in the analytical suite for selected samples to support IDW disposal and potential future waste management issues. The radionuclides are not intended to drive the nature and extent determinations under this investigation. The critical COPCs for CAU 528 are TPH and PCBs. Polychlorinated biphenyls are known to be present within the CAS boundaries and TPH has a reasonable probability of being present at CAS 25-27-03 based on process knowledge, experience at other similar CASs, and other historic information. The critical COPCs are given greater importance in the decision-making process relative to noncritical COPCs. For this reason, more stringent performance criteria are specified for critical analyte DQIs (Section 6.0 of the CAIP). Noncritical COPCs are defined as classes of contaminants that include all the analytes reported from the respective analytical methods that have PALs. The noncritical COPCs also aid in reducing the uncertainty concerning the history and potential releases from the CAS and help in the accurate evaluation of potential contamination. If a COPC, either critical or noncritical, is detected in any sample at a concentration above the respective PAL, the COPC will be identified as a COC. During Phase II sampling and analysis, all COCs are considered critical parameters Sections 3.0 and 6.0 of the CAIP provide the analytical methods and laboratory requirements (e.g., detection limits, precision, and accuracy) to be followed during this CAI. Sample volumes are laboratory- and method-specific and will be determined in accordance with laboratory requirements. Analytical requirements (e.g., methods, detection limits, precision, and accuracy) are specified in the Industrial Sites QAPP (NNSA/NV, 2002), unless superseded by the CAIP. These requirements will ensure that laboratory analyses are sufficient to detect contamination in samples at concentrations exceeding the MRL. Specific analyses, if any, required for the disposal of IDW are identified in Section 5.0 of the CAIP.

For sampling performed to define the extent of contamination (Decision II) at CAS 25-27-03, samples will be collected and analyzed only for COCs identified in samples collected to resolve Decision I. However, if extent samples are collected prior to nature-of-contamination data becoming available, the extent samples will be analyzed for the full list parameters given in Table A.1-4. For samples collected to define the extent of contamination, critical analytes are the COCs identified during Decision I (Phase I) activities that exceed PALs.

A.1.5 Step 4 - Define the Study Boundaries

The purpose of this step is to define the target population of interest, specify the spatial and temporal features of that population that are pertinent for decision making, determine practical constraints on data collection, and define the scale of decision making relevant to target populations for Decision I and Decision II.

A.1.5.1 Define the Target Population

Decision I target populations represent locations within the CAS that contain COCs, if present. Decision II target populations are areas within the CAS where COC concentrations are less than PALs and are contiguous to areas of COC contamination. The target populations are dependent upon the CSM developed for CAS 25-27-03. These target populations represent locations within the CAS that, when sampled, will provide sufficient data to resolve the primary problem statement (Section A.1.3.1).

A.1.5.2 Identify the Spatial and Temporal Boundaries

Spatial (geographic) boundaries are defined as the vertical or horizontal boundaries beyond which the CSM and/or the scope of the investigation will require reevaluation. Intrusive sampling activities are not intended to extend into the boundaries of neighboring areas of environmental concern (e.g., other CASs). The horizontal boundaries at CAS 25-27-03 reflect the area of concern (i.e., the suspected lateral extent of surface contamination) where COCs potentially may exist. Although radiological contamination related to the TCC testing activities may be "superimposed" on the CAS 25-27-03 footprint, the contamination will not be investigated by the CAU 528 CAI. As mentioned previously, radiological concerns are related to IDW disposal and future waste management issues. The spatial boundaries for CAS 25-27-03 are listed in Table A.1-5. The horizontal boundaries at CAS 25-27-03 reflect the uncertainty in the locations where CAS-specific contaminants may be present within TCC.

Temporal boundaries are time constraints due to time-related phenomena, such as weather conditions, seasons, activity patterns, etc. Significant temporal constraints due to weather conditions are not expected; however, snow events may affect site activities during winter months. Moist weather may place constraints on sampling and field-screening of contaminated soils because of the attenuating effect of moisture in samples. There are no time constraints on collecting samples.

Table A.1-5
Spatial Boundaries for CAU 528, CAS 25-27-03

Spatial Boundary	
Horizontal	**Vertical**
A maximum 100-ft buffer around the TCC fencing on the north, east, and south sides of TCC. The edge of Topopah Wash along the western side of TCC	A maximum of 10 ft bgs
A maximum of 50 ft around the concrete pad to include the earthen berm	A maximum of 10 ft bgs

A.1.5.3 Identify Practical Constraints

Nevada Test Site-controlled activities may affect the ability to characterize the CAS, although the TCC is inactive and abandoned. The primary practical constraints to be encountered at CAS 25-27-03 would be the presence of underground utilities. Utility constraints are subject to change as additional information is collected prior to the commencement of investigation activities, and will be appropriately documented. Locations where intrusive activities are planned will be surveyed for utilities prior to field activities in accordance with the SSHASP.

A.1.5.4 Define the Scale of Decision Making

For CAS 25-27-03, the scale of decision making for Decision I is defined as CAS 25-27-03. The scale of decision making for Decision II is defined as the extent of COC contamination originating from CAS 25-27-03.

A.1.6 Step 5 – Develop a Decision Rule

This step integrates outputs from the previous steps, with the inputs developed in this step into a decision rule (*"If..., then..."*) statement. This decision rule describes the conditions under which possible alternative actions would be chosen.

A.1.6.1 Specify the Population Parameter

The population parameter for Phase I data collected from biased sample locations is the maximum observed concentration of each COC within the target population.

The population parameter for Phase II data will be the observed concentration of each unbounded COC in any sample.

A.1.6.2 Choose an Action Level

Action levels are defined as the PALs, which are specified in Section A.1.4.2.

A.1.6.3 Decision Rule

If the concentration of any COPC in a target population exceeds the PAL for a COPC in a Phase I sample, then that COPC is identified as a COC, and the extent of contamination (Phase II) sampling will be conducted. If the Site Supervisor determines that an indicator of contamination is present, then Phase II sampling may be conducted before the results of Phase I sampling are available. If all COPC concentrations are less than the corresponding PALs, then the decision will be no further actions. Based on PA sampling results, the CAI at CAS 25-27-03 will include extent (Phase II) sampling for PCBs during the initial field effort.

If the observed population parameter of any COC in a Phase II sample exceeds the PALs, then additional samples will be collected to complete the Phase II evaluation. If all observed COC population parameters are less than PALs, then the decision will be that the extent of contamination has been defined in the lateral and vertical directions.

If contamination is inconsistent with the CSM or extends beyond the identified spatial boundaries, then work will be suspended and the investigation strategy will be reevaluated. If contamination is consistent with the CSM and is within spatial boundaries, then the decision will be to continue sampling to define extent.

A.1.7 Step 6 – Specify the Tolerable Limits on Decision Errors

The sampling approach for the investigation relies on biased sampling locations; therefore, statistical analysis is not appropriate. Only validated analytical results (quantitative data) will be used to determine if COCs are present (Phase I) or the extent of a COC (Phase II), unless otherwise stated. . The baseline condition (i.e., null hypothesis) and alternative condition for Phase I are:

- Baseline condition – A COC other than PCBs is present.
- Alternative condition – A COC other than PCBs is not present.

The baseline condition (i.e., null hypothesis) and alternative condition for Phase II are:

- Baseline condition – The extent of a COC including PCBs has not been defined.
- Alternative condition – Extent of a COC including PCBs has been defined.

Decisions and/or criteria have an alpha (false negative) or beta (false positive) error associated with their determination (discussed in the following subsections). Since quantitative data compared to action levels on a point-by-point basis, statistical evaluations of the data such as averages or confidence intervals are not appropriate.

A.1.7.1 False Negative (Rejection) Decision Error

The false negative (rejection of the null hypothesis or alpha error) decision error would mean:

- Deciding that a COC is not present when it actually is (Decision I), or
- Deciding that the extent of a COC has been defined when it actually has not (Decision II).

In both cases, this would result in an increased risk to human health and environment.

For Decision I, a false negative decision error (where the consequences are more severe) is controlled by meeting the following criteria:

- Having a high degree of confidence that the sample locations selected will identify COCs if present anywhere within the CAS

- Having a high degree of confidence that analyses selected (both field screening and confirmatory laboratory) will be sufficient to detect any COCs present in the sampled media and that the detection limits are adequate to ensure an accurate quantification of the COCs.

For Decision II, the false negative decision error is reduced by:

- Having a high degree of confidence that the sample locations selected will identify the extent of COCs
- Having a high degree of confidence that analyses conducted will be sufficient to detect any COCs present in the samples
- Having a high degree of confidence that the dataset is of sufficient quality and completeness

To satisfy the first criterion for both decisions, Phase I samples will be collected in areas most likely to be contaminated by PCBs; any other COPCs, and Phase II samples will be collected in areas that represent the lateral and vertical extent of COCs including PCBs. The following characteristics are considered during both phases to accomplish the first criterion:

- Source and location of release
- Chemical nature and fate properties
- Physical properties and migration/transport pathways
- Hydrologic drivers

These characteristics were considered during the development of the CSMs. The biasing factors listed in Table A.1-3 and Section A.1.8.1 will be used to further ensure that these criteria are met.

To satisfy the second criterion for Decision I, all samples used to define the nature of contamination will be analyzed for the parameters listed in Section A.1.4.3.3 using analytical methods that are capable of producing quantitative data at concentrations equal to or below PALs (unless stated otherwise in the CAIP). To satisfy the second criterion for Decision II, Phase II samples will be analyzed for those parameters that identified unbounded COCs.

To satisfy the third criterion for Decision II, the entire dataset, as well as individual sample results, will be assessed against the DQIs of precision, accuracy, comparability, completeness, and representativeness defined in the Industrial Sites QAPP (NNSA/NV, 2002). The goal for the completeness DQI is that 100 percent of the critical COPC results are valid for every sample. Critical COPCs are defined as those contaminants that are known or expected to be present within a CAS (Section A.1.4.3.3). In addition, sensitivity has been included as a DQI for laboratory analyses. Site-specific DQIs are discussed in more detail in Section 6.0 of the CAIP. Strict adherence to established procedures and QA/QC protocols also protects against false negatives.

A.1.7.2 False Positive Decision Error

The false positive (acceptance of the null hypothesis or beta) decision error would mean:

- Deciding that a COC is present when it actually is not (Decision I)
- Accepting that the extent of a COC has not been defined when it really has (Decision II)

These errors result in increased costs for unnecessary characterization or corrective actions.

The false positive decision error is controlled by protecting against false positive analytical results. False positive results are typically attributed to laboratory and/or sampling/handling errors. Quality assurance (QC) samples such as field blanks, trip blanks, laboratory control samples, and method blanks minimize the risk of a false positive analytical result. Other measures include proper decontamination of sampling equipment and using certified clean sample containers to avoid cross-contamination.

A.1.7.3 Quality Assurance/Quality Control

Field screening equipment will be calibrated and checked in accordance with the manufacturer's instructions or approved.

Quality control samples will be collected as required by the Industrial Site QAPP (NNSA/NV, 2002) and in accordance with established procedures. These procedures apply to both the quick-turnaround and standard analyses. The required QA field samples include:

- Trip blanks (1 per sample cooler containing environmental VOC samples)
- Equipment blanks (1 per sampling event for each type of decontamination procedure)
- Source blanks (1 per source lot per sampling event)
- Field duplicates (minimum of 1 per matrix per 20 environmental samples or 1 per CAS if less than 20 collected)
- Field blanks (minimum of 1 per 20 environmental samples, or 1 per CAS if less than 20 collected)
- Matrix spike/matrix spike duplicate (minimum of 1 per matrix per 20 environmental samples or 1 per CAS if less than 20 collected, not required for all radionuclide measurements)

Additional QC samples may be submitted based on site-specific conditions.

A.1.8 Step 7 – Optimize the Design for Obtaining Data

This section presents an overview of the resource-effective strategy planned to obtain the data required to meet the project DQOs developed in previous six steps. Section A.1.8.1 provides general investigation strategy, and Section A.1.8.2 provides the detailed sampling approach to resolve the decision statements for CAU 528. As additional data or information is obtained, this step will be reevaluated and refined, if necessary, to reduce uncertainty and increase the confidence that the nature and extent of contamination is accurately defined.

A.1.8.1 General Investigation Strategy

The initial activities to be conducted will be a visual inspection and photodocumentation of the area of CAS 25-27-03. The visual inspection will provide additional biasing factors for locating soil samples and to identify any potential conditions that may affect sampling and sample locations.

Following visual inspection, approximately 40 surface soil sample (0 to 0.5 ft bgs) locations will be identified and collected for quick-turnaround PCB laboratory analysis. The selection of these locations considers the locations of the previous sampling results where PCBs are know to be present. The PCB quick-turnaround results, along with existing analytical data, will be used to select locations where additional Phase I (Decision I) confirmatory samples may be necessary. Phase I (Decision I) surface and shallow subsurface soil samples will be collected for laboratory analysis of the parameters identified in Section A.1.4.3.3.

Phase II (step-out) sampling locations at CAS 25-27-03 will be selected based on the outer boundary sample locations where a COC is detected in the Phase I confirmatory samples. Phase II locations will also be selected based on pertinent features of the CSM and the other biasing factors. If biasing factors indicate a COC potentially extends beyond planned Phase II sample points, locations may be modified or additional Phase II samples may be collected from incremental step-out locations. Both surface and subsurface soil samples may be collected and analyzed to determine the extent of a COC.

Contaminants determined not to be present in Phase I samples may be eliminated from Phase II analytical suites. In general, samples submitted for off-site analysis will be those that define the

nature (Phase I) and extent (Phase II) of COCs. This effort will apply to the lateral and vertical extent of the COCs.

A.1.8.2 Detailed Investigation Strategy

The initial activities to be conducted will be a visual inspection and photodocumentation of CAS 25-27-03. The visual inspection will focus on identifying evidence of contamination at the Substation #3 concrete pad resulting from a failure or leak from the transformers. The soils surrounding TCC that may have been subjected to dust suppression activities will also be inspected for discoloration or other signs of contamination. The information generated during these initial activities will be used to provide additional biasing factors for the placement of field screening and confirmatory soil samples.

Following visual inspection, surface soil sample locations will be established for quick-turnaround analysis. This effort will use the data from previously collected samples and other biasing factors to identify sampling points along the edge of the TCC concrete pad. Previous analytical data may be used in the decision process if the data meet the quality criteria specified in this DQO process. Additional surface soil sampling points will be established at 25- to 50-ft lateral step-out locations moving away from the TCC pad toward the fence along the northern, eastern, and southern side of the facility. Step-out locations also will be identified moving west from the TCC concrete pad toward the edge of Topopah Wash. No sampling is planned within the wash. To determine the presence of contaminants that may have potentially originated from the Substation #3 concrete pad, surface soil screening points will be located at two 15- to 20-ft intervals from each side of the Substation #3 concrete pad and on and around the earthern berm. Figure A.1-5 shows a generalized sampling plan for CAU 528. It is anticipated that surface soil samples from approximately 40 to 50 locations will be collected for quick-turnaround laboratory PCB analysis; the actual number will depend on the site-specific conditions and the results of the initial group of quick-turnaround analyses.

The following are the biasing factors that currently have been identified for consideration in the selection of the surface soil field-screening sample locations:

- Aerial photograph review and evaluation
- Visual indicators (e.g., staining, topography, areas of preferential surface runoff)
- Existing site-specific analytical data (PA and CAU 262 sampling data)

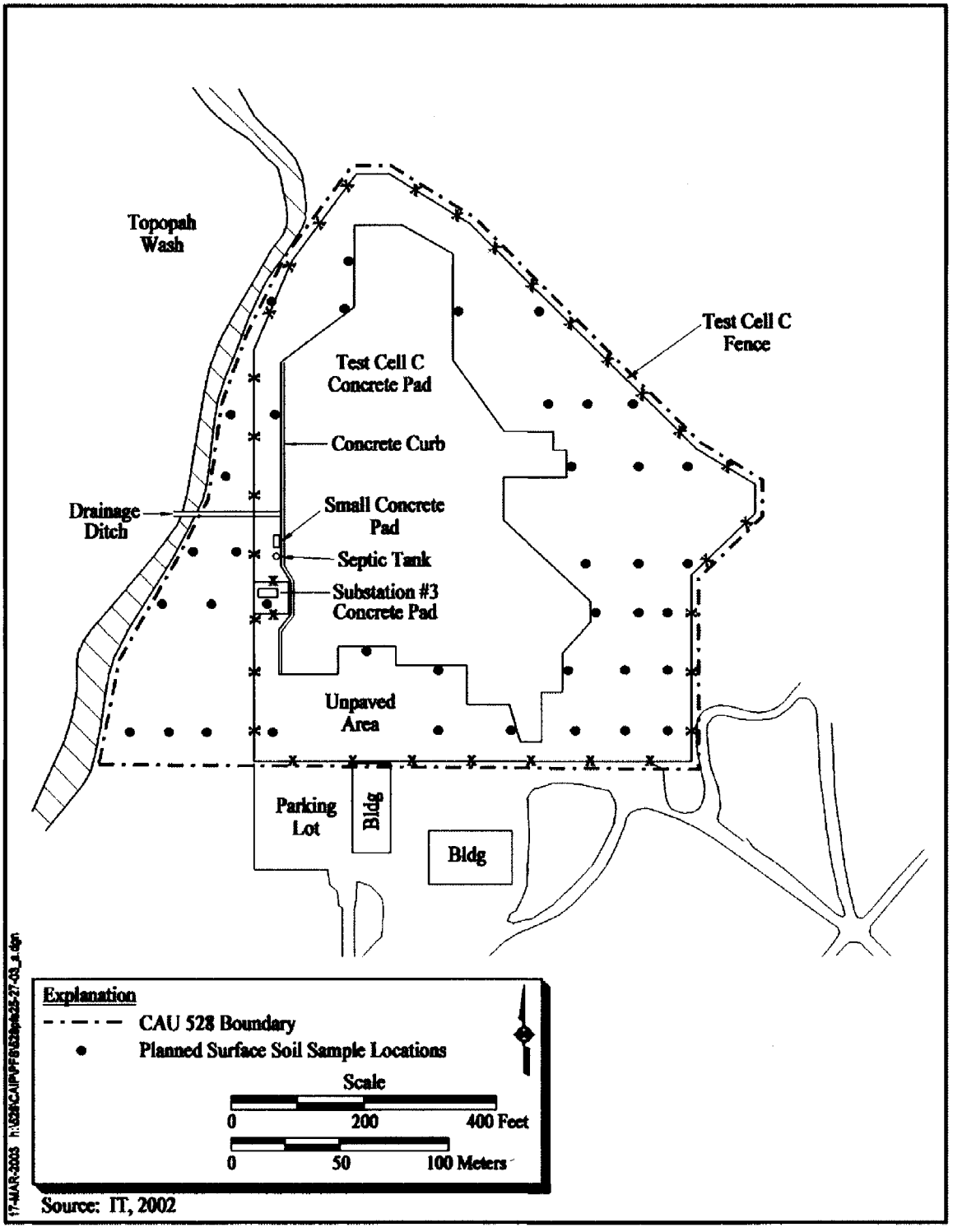

Figure A.1-5
CAU 528, CAS 25-27-03 Potential Surface Soil Sample Locations

- Known or suspected sources and locations of release
- Process knowledge and experience at similar sites
- Information and/or data from adjacent CASs
- Geologic and/or hydrologic conditions
- Physical and chemical characteristics of suspected contaminants

The samples selected for the confirmation of Phase I (approximately 25 percent of total samples submitted for quick-turnaround PCB analysis) will be analyzed for the full suite of analyses presented in Section A.1.4.3.3. Selection of the Phase II (extent) samples will follow the same procedure but are expected to require less quick-turnaround analyses.

These analyses will accurately determine the concentrations of detected PCBs and other COPCs and identify additional COCs. Samples will be submitted to support Decision I (from worst-case locations) and to support Decision II (confirm the horizontal extent of contamination). Data collected during previous sampling events, quick-turnaround results, and the other biasing factors listed above will be used to select locations where the presence of COCs is or is not suspected (Decision I and Decision II, respectively). If necessary, additional surface soil samples will be submitted for laboratory analysis to ensure that the extent of contamination is defined using quantitative data. Lateral step-outs distances will generally be consistent with the 25- to 50-ft spacing discussed above but can be adjusted by the Site Supervisor based on site-specific information obtained during the initial sampling effort.

Where PCBs exceed the PALs in surface soil based on quick-turnaround analyses and previous sampling results, shallow subsurface soil samples will be collected from selected locations to define the vertical extent of contamination. To determine if clean soil has been placed over contaminated subsoil, shallow subsurface soil samples will also be collected from approximately 25 percent of the locations where PCBs were not detected by quick-turnaround or confirmatory analysis in the surface samples.

The sampled depth intervals at subsurface locations will be based on biasing factors such as presence of debris, staining, odor, FSRs, or professional judgement. Test pits may be excavated to further evaluate the potential that clean soil was backfilled over contamination and to assist in the collection of biased subsurface soil samples. For subsurface sampling locations, generally two consecutive soil samples with results below field-screening action levels are required to define the vertical extent of

contamination. Generally, the uppermost "clean" sample from each location will be submitted for laboratory analysis.

At locations where Phase I analytical results show PCB concentrations in soil equal to or greater than 50 ppm, step-out (both vertical and horizontal) samples will be collected during the Phase II sampling to delineate the extent of the potential hot spots. Step-outs from PCB hot spots will continue until the extent of PCB concentrations greater than or equal to 25 ppm is delineated.

Surface soil samples will be collected by hand. Sonic drilling, hollow-stem auger drilling, direct-push, handheld augers, or excavation will be used, as appropriate, to collect subsurface samples. Samples for IDW and waste characterization purposes may also be collected at CAS 25-27-03.

Due to the nature of buried features possibly present (e.g., structures, buried debris, and utilities), sample locations may be relocated, based upon the review of engineering drawings, and information obtained during the site visit. However, the new locations will meet the decision needs and criteria stipulated in Section A.1.4.1.

A.1.9 References

DOE/NV, see U.S. Department of Energy, Nevada Operations Office.

EPA, see U.S. Environmental Protection Agency.

IT, see IT Corporation.

IT Corporation. 2002. Project file for CAU 528, CAS 25-27-03, and field forms. Las Vegas, NV.

LASL, see Los Alamos Scientific Laboratory.

Los Alamos Scientific Laboratory. 1967. *Decontamination of Test Cell "C" at the Nuclear Rocket Development Station After a Reactor Accident,* LA-3633-MS. Los Alamos, NM.

Moore, J., Science Applications International Corporation. 1999. Memorandum to M. Todd (SAIC) entitled, "Background Concentrations for NTS and TTR Soil Samples," 3 February. Las Vegas, NV: IT Corporation.

NAC, see *Nevada Administrative Code.*

NBMG, see Nevada Bureau of Mines and Geology.

NNSA/NV, see U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.

Nevada Administrative Code. 2002. NAC 445A.2272, "Contamination of Soil: Establishment of Action Levels." Carson City, NV.

Nevada Bureau of Mines and Geology. 1998. *Mineral and Energy Resource Assessment of the Nellis Air Force Range*, Open-File Report 98-1. Reno, NV.

Tinney, J. 2001. *Contamination of the Topopah Wash from the Kiwi Transient Nuclear Test, the Phoebus la Accident, and Phoebus 2A Tests*. Prepared for IT Corporation. Las Vegas, NV.

USGS, see U.S. Geological Survey.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002. *Industrial Sites Quality Assurance Project Plan, Nevada Test Site, Nevada*, DOE/NV--372-Rev. 3. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 1996. *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada,* DOE/EIS 0243. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 1998. *Nevada Test Site Resource Management Plan,* DOE/NV--518. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 2001. *Corrective Action Decision Document for Corrective Action Unit 262: Area 25 Septic Systems and Underground Discharge Point, Nevada Test Site, Nevada*, DOE/NV--744, Rev. 4. Las Vegas, NV.

U.S. Environmental Protection Agency. 2000. Memorandum from S.J. Smucker to PRG table mailing list regarding *Region IX Preliminary Remediation Goals (PRGs)*, 1 August. San Francisco, CA.

U.S. Environmental Protection Agency. 2002a. *Guidance for Quality Assurance Project Plans, EPA QA/G-5, EPA/240/R-02/009*. Washington, D.C.

U.S. Environmental Protection Agency. 2002b. *Region IX Preliminary Remediation Goals (PRGs).* Prepared by S.J. Smucker. San Francisco, CA.

U.S. Environmental Protection Agency. 2002c. Integrated Risk Information System (IRIS) Database, as accessed at http://www.epa.gov/iris/index.html on October 16, 2002.

APPENDIX B

SAMPLE ANALYTICAL RESULTS

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echtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST AND CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT / CLIENT INFORMATION			*REPORT & TURNAROUND INFORMATION*			*SAMPLE INFORMATION*
ct: CAU 528	BN Org#: B502		Send Report to: Alissa Silvas			Sampling Site: CAU 528 - Test Cell C
ge Number: 5B1A15D5			Phone: 295-7186	Fax: 295-7761	M/S: NTS306	The samples submitted contain (check);
ct Manager: Jeff Smith			Turnaround: (X) Standard – 14 days IH, 28 days Non-rad Env, 45 days Rad Env			( ) **Hazardous** - *(list)*
			( ) RUSH Preliminary by: _____ (IH)			( ) **Radioactive** - *(list)*
e: 295-7775	Fax: 295-7761	M/S: NTS306	___1 ___2 ___7 ___14 (non-Rad Env)			( ) **Unknown** contamination. If known, identify contaminants. This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.
			___1 ___7 ___14 ___28 (Radiological Env)			

SAMPLE MANAGEMENT INFORMATION

_____ (IH) V2684 (Non-Rad Env) _____ (Rad Env)

les submitted are associated with a signed Project SOW. (X) YES ( ) NO

ses entered here agree with the SOW. (X) YES ( ) NO ( ) N/A

identify the variation: _____

ntract Lab(s) used for this work: LIONVILLE

SCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres – Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: PCBs	3.1
3-V01	5/22/06	1354	Soil	1	250 ml				Cool 4C	X	
3-V02	5/22/06	1357	Soil	1	250 ml				Cool 4C	X	
3-V03	5/22/06	1400	Soil	1	250 ml				Cool 4C	X	
3-V04	5/22/06	1403	Soil	1	250 ml				Cool 4C	X	
3-V05	5/22/06	1406	Soil	1	250 ml				Cool 4C	X	
3-V06	5/22/06	~~1354~~ 1409	Soil	1	250 ml				Cool 4C	X	
3-V07	5/22/06	1412	Soil	1	250 ml				Cool 4C	X	
3-V08	5/22/06	1415	Soil	1	250 ml				Cool 4C	X	
3-V09	5/22/06	1418	Soil	1	250 ml				Cool 4C	X	
3-V10	5/22/06	1421	Soil	1	250 ml				Cool 4C	X	
3-V11	5/22/06	1424	Soil	1	250 ml				Cool 4C	X	
3-R1	5/22/06	1607	Water	1	1 L				Cool 4C	X	

CODY TRANSFER

d/Relinquished (print)	Signature	DATE / TIME	Received by (print)	Signature	DATE / TIME
sa Silvas		5/22/06 1615	Refridgerator	N/A	5/22/06 1615
frifrator	N/A		Kevin Campbell	Kevin Campbell	5/23/06 09:35
vin Campbell		5/23/06 0908	Jerry DUGAS	Jerry Dugas	5/23/06 0908
Alexandra LaGuardia	C.A. CASTANEDA for JSD	5/24/06@1302	Fed Ex	7921,0761 7363	5/24/06 @1300

FED EX

5-25-06 / 0920

D. Smith Donna for DS 5-25-06

5-25-06 0920

Retention Code: ENV.5.c(1)

BN-0732

PCBs by GC

Report Date: 06/14/06 18:27

RFW Batch Number: 0605L133 Client: BECHTEL NEVADA V2684 Work Order: 60052001001 Page: 1

0000000015

	Cust ID:	252703-V01	252703-V01	252703-V01	252703-V02	252703-V03	252703-V04
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	10.0	10.0	10.0	50.0	5.00	20.0
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	49 %	108 %	119 * %	114 %	110 %	82 %
	Decachlorobiphenyl	64 %	134 * %	142 * %	159 * %	124 * %	111 %
Arochlor-1016		140 U	122 %	122 %	670 U	68 U	280 U
Arochlor-1221		140 U	140 U	140 U	670 U	68 U	280 U
Arochlor-1232		140 U	140 U	140 U	670 U	68 U	280 U
Arochlor-1242		140 U	140 U	140 U	670 U	68 U	280 U
Arochlor-1248		140 U	140 U	140 U	670 U	68 U	280 U
Arochlor-1254		140 U	140 U	140 U	670 U	68 U	280 U
Arochlor-1260		140 U	I %	I %	670 U	68 U	280 U
Arochlor-1262		1500	2700	2400	7200	400	1900
Arochlor-1268		140 U	140 U	140 U	670 U	68 U	280 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

6/19/06

000000016

	Cust ID:	252703-V05	252703-V06	252703-V07	252703-V08	252703-V09	252703-V10
Sample Information	RFW#:	005	006	007	008	009	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	50.0	1.00	10.0	1.00	1.00	5.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		D %	97 %	191 * %	92 %	95 %	169 * %
Decachlorobiphenyl		D %	104 %	205 * %	101 %	99 %	193 * %
Arochlor-1016		680 U	14 U	140 U	14 U	14 U	69 U
Arochlor-1221		680 U	14 U	140 U	14 U	14 U	69 U
Arochlor-1232		680 U	14 U	140 U	14 U	14 U	69 U
Arochlor-1242		680 U	14 U	140 U	14 U	14 U	69 U
Arochlor-1248		680 U	14 U	140 U	14 U	14 U	69 U
Arochlor-1254		680 U	14 U	140 U	14 U	14 U	69 U
Arochlor-1260		680 U	14 U	140 U	14 U	14 U	69 U
Arochlor-1262		6200	54	1100	30	10 J	440
Arochlor-1268		680 U	14 U	140 U	14 U	14 U	69 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

0000000017

	Cust ID:	252703-V11		252703-R1		PBLKJA		PBLKJA BS		PBLKIP		PBLKIP BS	
Sample Information	RFW#:	011		012		06LE0462-MB1		06LE0462-MB1		06LE0443-MB1		06LE0443-MB1	
	Matrix:	SOIL		WATER		SOIL		SOIL		WATER		WATER	
	D.F.:	50.0		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/L		UG/KG		UG/KG		UG/L		UG/L	
Surrogate: Tetrachloro-m-xylene		D	%	75	%	95	%	92	%	63	%	85	%
Decachlorobiphenyl		D	%	68	%	98	%	97	%	81	%	82	%
			fl		fl		fl		fl		fl		fl
Arochlor-1016		710	U	0.41	U	13	U	105	%	0.40	U	106	%
Arochlor-1221		710	U	0.41	U	13	U	13	U	0.40	U	0.40	U
Arochlor-1232		710	U	0.41	U	13	U	13	U	0.40	U	0.40	U
Arochlor-1242		710	U	0.41	U	13	U	13	U	0.40	U	0.40	U
Arochlor-1248		710	U	0.41	U	13	U	13	U	0.40	U	0.40	U
Arochlor-1254		710	U	0.41	U	13	U	13	U	0.40	U	0.40	U
Arochlor-1260		710	U	0.41	U	13	U	108	%	0.40	U	104	%
Arochlor-1262		2500		0.41	U	13	U	13	U	0.40	U	0.40	U
Arochlor-1268		710	U	0.41	U	13	U	13	U	0.40	U	0.40	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

6/19/06

000000018

Cust ID: PBLKIP BSD

Sample Information
RFW#: 06LE0443-MB1
Matrix: WATER
D.F.: 1.00
Units: UG/L

Surrogate:	Tetrachloro-m-xylene	69	%
	Decachlorobiphenyl	81	%
Arochlor-1016		86	%
Arochlor-1221		0.40	U
Arochlor-1232		0.40	U
Arochlor-1242		0.40	U
Arochlor-1248		0.40	U
Arochlor-1254		0.40	U
Arochlor-1260		92	%
Arochlor-1262		0.40	U
Arochlor-1268		0.40	U

U= Analyzed; not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

2E

WATER PESTICIDE SURROGATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 0052-01-01

Case No.: BECHTEL NEVADA V2684

RFW Lot No.: 0605L133

	CLIENT SAMPLE NO.	S1 ( )#	OTHER
01	252703-R1	75	68
02	PBLKIPLE0443-MB1	63	81
03	PBLKIPLE0443-MB1 BS	85	82
04	PBLKIPLE0443-MB1 BSD	69	81

		ADVISORY QC LIMITS
S1 ( )	= Tetrachloro-m-xylene	(27-129)
S2 ( )	= Decachlorobiphenyl	(22-126)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

6/14/16

2F

SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 0052-01-01

Case No.: BECHTEL NEVADA V2684

RFW Lot No.: 0605L133

	CLIENT SAMPLE NO.	S1 ( )#	OTHER
01	252703-V01	49	64
02	252703-V01MS	108	134 *
03	252703-V01MSD	119 *	142 *
04	252703-V02	114	159 *
05	252703-V03	110	124 *
06	252703-V04	82	111
07	252703-V05	D	D
08	252703-V06	97	104
09	252703-V07	191 *	205 *
10	252703-V08	92	101
11	252703-V09	95	99
12	252703-V10	169 *	193 *
13	252703-V11	D	D
14	PBLKJALE0462-MB1	95	98
15	PBLKJALE0462-MB1 BS	92	97

	ADVISORY QC LIMITS
S1 ( ) = Tetrachloro-m-xylene	(28-118)
S2 ( ) = Decachlorobiphenyl	(38-122)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 0052-01-01

Case No.: BECHTEL NEVADA V2684 RFW Lot No.: 0605L133-001

MATRIX Spike - Sample No.: 252703-V01 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
Arochlor-1016	170	0	206	122	60 -140
Arochlor-1260	170	0	0	I	60 -140

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Arochlor-1016	170	208	122	0	NA	60 -140
Arochlor-1260	170	0	I	0	NA	60 -140

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS:

3F

SOIL PESTICIDE MATRIX SPIKE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 0052-01-01

Case No.: BECHTEL NEVADA V2684 RFW Lot No.: 0605L133

MATRIX Spike - Sample No.: PBLKJALE0462-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
Arochlor-1016	167	0	175	105	60 -140
Arochlor-1260	167	0	180	108	60 -140

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 2 outside limits

COMMENTS:

6/16

3E

WATER PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 0052-01-01

Case No.: BECHTEL NEVADA V2684 RFW Lot No.: 0605L133

MATRIX Spike - Sample No.: PBLKIPLE0443-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	MS CONCENTRATION UG/L	MS % REC #	QC LIMITS REC
Arochlor-1016	5.00	0	5.32	106	50 -130
Arochlor-1260	5.00	0	5.22	105	50 -130

COMPOUND	SPIKE ADDED UG/L	MSD CONCENTRATION UG/L	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Arochlor-1016	5.00	4.29	86	20	NA	50 -130
Arochlor-1260	5.00	4.58	92	13	NA	50 -130

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS:

4/15/16

4D
METHOD BLANK SUMMARY

Lab Name: Lionville Labs, Inc. Contract: 60052-001-001-0001-00

Case No.: BECHTEL NEVADA V2684

Lab Sample ID: 06LE0462-MB1 Lab File ID: BLK08330.01

Matrix:(Soil/Water) SOIL Level:(low/med) LOW

Date Extracted: 06/06/06 Extraction:(SepF/Cont/Sonc) ****

Date Analyzed (1): 06/13/06 Time Analyzed (1): ____

Instrument ID (1): 13 GC Column ID (1): RTX-CLP

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1
01	252703-V01	0605L133-001	06/13/06
02	252703-V01MS	0605L133-001S	06/13/06
03	252703-V01MSD	0605L133-001T	06/13/06
04	252703-V02	0605L133-002	06/13/06
05	252703-V03	0605L133-003	06/13/06
06	252703-V04	0605L133-004	06/13/06
07	252703-V05	0605L133-005	06/13/06
08	252703-V06	0605L133-006	06/13/06
09	252703-V07	0605L133-007	06/14/06
10	252703-V08	0605L133-008	06/14/06
11	252703-V09	0605L133-009	06/13/06
12	252703-V10	0605L133-010	06/14/06
13	252703-V11	0605L133-011	06/14/06
14	PBLKJALE0462-MB1 BS	06LE0462-MB1S	06/13/06

6/13/06

COMMENTS:

FORM IV

4D
METHOD BLANK SUMMARY

Lab Name: Lionville Labs, Inc. Contract: 60052-001-001-0001-00

Case No.: BECHTEL NEVADA V2684

Lab Sample ID: 06LE0443-MB1 Lab File ID: BLK00PPB.02

Matrix:(Soil/Water) WATER Level:(low/med) LOW

Date Extracted: 05/29/06 Extraction:(SepF/Cont/Sonc) CONT

Date Analyzed (1): 06/04/06 Time Analyzed (1): ____

Instrument ID (1): __ GC Column ID (1): RTX-CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1
01	252703-R1	0605L133-012	06/04/06
02	PBLKIPLE0443-MB1 BS	06LE0443-MB1S	06/04/06
03	PBLKIPLE0443-MB1 BSD	06LE0443-MB1T	06/04/06

COMMENTS:

6/6/06

CHAIN OF CUSTODY RECORD

Environmental Technical Services

SDG #: V2685

000000010

n of Custody No:	0605/H0060/LION	Laboratory:	LIO30028
pling Event:	0605/SWMHZ/2006-H0060	BN Record Owner:	SWMHZ
t ID:	0605/SWMHZ/TEST CELL C	Charge Code:	5B1A15D6
ected By:			

equested Analysis:

Sample ID	Sample Matrix	Collection Date Time	Filtered	LEVELS Anal.	LEVELS Priority	Pay Item	Description	Comments
SWMHZ00213	SO	5/18/06	U	D	14	8.1	PCBs only	1356
			U	D	14	9.23	TCLP Metals	
SWMHZ00214	SO		U	D	14	8.1	PCBs only	1404
			U	D	14	9.23	TCLP Metals	
SWMHZ00215	SO		U	D	14	8.1	PCBs only	1415
			U	D	14	9.23	TCLP Metals	
SWMHZ00216	SO		U	D	14	8.1	PCBs only	RM 1413 1430
			U	D	14	9.23	TCLP Metals	
SWMHZ00217	SO		U	D	14	8.1	PCBs only	1535
			U	D	14	9.23	TCLP Metals	
SWMHZ00218	SO		U	D	14	8.1	PCBs only	1543
			U	D	14	9.23	TCLP Metals	
SWMHZ00219	SO		U	D	14	8.1	PCBs only	1547
			U	D	14	9.23	TCLP Metals	
SWMHZ00220	SO		U	D	14	8.1	PCBs only	1550
			U	D	14	9.23	TCLP Metals	

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 06/14/06 18:22

RFW Batch Number: 0605L134 Client: BECHTEL NEVADA V2685 Work Order: 60052001001 Page: 1

	Cust ID:	SWMHZ00213		SWMHZ00214		SWMHZ00215		SWMHZ00216		SWMHZ00217		SWMHZ00218	
Sample Information	RFW#:	001		002		003		004		005		006	
	Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
	D.F.:	50.0		5.00		5.00		50.0		1.00		10.0	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate:	Tetrachloro-m-xylene	D	%	105	%	101	%	D	%	188 *	%	103	%
	Decacnlorobiphenyl	D	%	121	%	117	%	D	%	181 *	%	124 *	%
			fl		fl		fl		fl		fl		fl
Arochlor-1016		680	U	69	U	70	U	690	U	14	U	140	U
Arochlor-1221		680	U	69	U	70	U	690	U	14	U	140	U
Arochlor-1232		680	U	69	U	70	U	690	U	14	U	140	U
Arochlor-1242		680	U	69	U	70	U	690	U	14	U	140	U
Arochlor-1248		680	U	69	U	70	U	690	U	14	U	140	U
Arochlor-1254		680	U	69	U	70	U	690	U	14	U	140	U
Arochlor-1260		680	U	69	U	70	U	690	U	14	U	140	U
Arochlor-1262		4600		480		260		5800		27		840	
Arochlor-1268		680	U	69	U	70	U	690	U	14	U	140	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 06/14/06 18:22

RFW Batch Number: 0605L134 Client: BECHTEL NEVADA V2685 Work Order: 60052001001 Page: 2

	Cust ID:	SWMHZ00219	SWMHZ00220	PBLKJA	PBLKJA BS
Sample Information	RFW#:	007	008	06LE0462-MB1	06LE0462-MB1
	Matrix:	SOLID	SOLID	SOIL	SOIL
	D.F.:	1.00	5.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	86 %	157 * %	95 %	92 %
	Decachlorobiphenyl	96 %	172 * %	98 %	97 %
Arochlor-1016		14 U	70 U	13 U	105 %
Arochlor-1221		14 U	70 U	13 U	13 U
Arochlor-1232		14 U	70 U	13 U	13 U
Arochlor-1242		14 U	70 U	13 U	13 U
Arochlor-1248		14 U	70 U	13 U	13 U
Arochlor-1254		14 U	70 U	13 U	13 U
Arochlor-1260		14 U	70 U	13 U	108 %
Arochlor-1262		110	260	13 U	13 U
Arochlor-1268		14 U	70 U	13 U	13 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Inc

INORGANICS DATA SUMMARY REPORT 06/08/06

CLIENT: BECHTEL NEVADA V26BS LVL LOI #: 06051134

WORK ORDER: 60052-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	SWMHZ00213	Silver ICLP Leachate	5.6	U	UG/L	5.6	1.0
		Arsenic ICLP Leachate	31.2		UG/L	24.6	1.0
		Barium ICLP Leachate	301		UG/L	3.0	1.0
		Cadmium, ICLP Leachate	4.2	U	UG/L	4.2	1.0
		Chromium, ICLP Leachate	6.4	U	UG/L	6.4	1.0
		Mercury ICLP Leachate	0.10	U	UG/L	0.10	1.0
		Lead, ICLP Leachate	26.0	U	UG/L	26.0	1.0
		Selenium ICLP Leachate	36.5	U	UG/L	36.5	1.0
-010	SWMHZ00214	Silver, ICLP Leachate	5.6	U	UG/L	5.6	1.0
		Arsenic ICLP Leachate	24.6	U	UG/L	24.6	1.0
		Barium ICLP Leachate	217		UG/L	3.0	1.0
		Cadmium, ICLP Leachate	4.2	U	UG/L	4.2	1.0
		Chromium ICLP Leachate	6.4	U	UG/L	6.4	1.0
		Mercury, ICLP Leachate	0.10	U	UG/L	0.10	1.0
		Lead, ICLP Leachate	26.0	U	UG/L	26.0	1.0
		Selenium, ICLP Leachate	36.5	U	UG/L	36.5	1.0
-011	SWMHZ00215	Silver ICLP Leachate	5.6	U	UG/L	5.6	1.0
		Arsenic, ICLP Leachate	40.0		UG/L	24.6	1.0
		Barium, ICLP Leachate	175		UG/L	3.0	1.0
		Cadmium ICLP Leachate	4.2	U	UG/L	4.2	1.0
		Chromium, ICLP Leachate	6.4	U	UG/L	6.4	1.0
		Mercury, ICLP Leachate	0.10	U	UG/L	0.10	1.0
		Lead ICLP Leachate	26.0	U	UG/L	26.0	1.0
		Selenium, ICLP Leachate	36.5	U	UG/L	36.5	1.0
-012	SWMHZ00216	Silver ICLP Leachate	5.6	U	UG/L	5.6	1.0
		Arsenic, ICLP Leachate	24.6	U	UG/L	24.6	1.0
		Barium ICLP Leachate	151		UG/L	3.0	1.0
		Cadmium ICLP Leachate	4.2	U	UG/L	4.2	1.0
		Chromium ICLP Leachate	6.4	U	UG/L	6.4	1.0
		Mercury, ICLP Leachate	0.10	U	UG/L	0.10	1.0
		Lead, ICLP Leachate	26.0	U	UG/L	26.0	1.0
		Selenium ICLP Leachate	36.5	U	UG/L	36.5	1.0

Lionville Laboratory Inc

INORGANICS DATA SUMMARY REPORT 06/08/06

CLIENT: BECHTEL NEVADA V26A5 LVL LOT #: 060511134

WORK ORDER: 60052-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-013	SWMHZ00217	Silver, ICLP Leachate	5.6	U	UG/L	5.6	1.0
		Arsenic ICLP Leachate	24.6	U	UG/L	24.6	1.0
		Barium ICLP Leachate	193		UG/L	3.0	1.0
		Cadmium ICLP Leachate	4.2	U	UG/L	4.2	1.0
		Chromium ICLP Leachate	6.4	U	UG/L	6.4	1.0
		Mercury ICLP Leachate	0.19		UG/L	0.10	1.0
		Lead, ICLP Leachate	26.0	U	UG/L	26.0	1.0
		Selenium ICLP Leachate	36.5	U	UG/L	36.5	1.0
-014	SWMHZ00218	Silver ICLP Leachate	5.6	U	UG/L	5.6	1.0
		Arsenic ICLP Leachate	27.3		UG/L	24.6	1.0
		Barium, ICLP Leachate	186		UG/L	3.0	1.0
		Cadmium ICLP Leachate	4.2		UG/L	4.2	1.0
		Chromium, ICLP Leachate	6.4	U	UG/L	6.4	1.0
		Mercury ICLP Leachate	0.10	U	UG/L	0.10	1.0
		Lead ICLP Leachate	32.5		UG/L	26.0	1.0
		Selenium ICLP Leachate	36.5	U	UG/L	36.5	1.0
-015	SWMHZ00219	Silver, ICLP Leachate	5.6	U	UG/L	5.6	1.0
		Arsenic ICLP Leachate	27.5		UG/L	24.6	1.0
		Barium ICLP Leachate	137		UG/L	3.0	1.0
		Cadmium ICLP Leachate	4.2	U	UG/L	4.2	1.0
		Chromium ICLP Leachate	6.4	U	UG/L	6.4	1.0
		Mercury, ICLP Leachate	0.10	U	UG/L	0.10	1.0
		Lead ICLP Leachate	26.0	U	UG/L	26.0	1.0
		Selenium ICLP Leachate	36.5	U	UG/L	36.5	1.0
-016	SWMHZ00220	Silver ICLP Leachate	5.6	U	UG/L	5.6	1.0
		Arsenic ICLP Leachate	24.6	U	UG/L	24.6	1.0
		Barium, ICLP Leachate	168		UG/L	3.0	1.0
		Cadmium ICLP Leachate	4.2	U	UG/L	4.2	1.0
		Chromium ICLP Leachate	6.4	U	UG/L	6.4	1.0
		Mercury ICLP Leachate	0.10	U	UG/L	0.10	1.0
		Lead, ICLP Leachate	26.0	U	UG/L	26.0	1.0
		Selenium, ICLP Leachate	36.5	U	UG/L	36.5	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/08/06

CLIENT: BECHTEL NEVADA V2685 LVL LOT #: 0605L134

WORK ORDER: 60052-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0349-MB1	Silver ICLP Leachate	5.6	u	UG/L	5.6	1.0
		Arsenic, ICLP Leachate	24.6	u	UG/L	24.6	1.0
		Barium, ICLP Leachate	3.0	u	UG/L	3.0	1.0
		Cadmium ICLP Leachate	4.2	u	UG/L	4.2	1.0
		Chromium, ICLP Leachate	6.4	u	UG/L	6.4	1.0
		Lead, ICLP Leachate	26.0	u	UG/L	26.0	1.0
		Selenium, ICLP Leachate	36.5	u	UG/L	36.5	1.0
BLANK2	06L0349-MB2	Silver ICLP Leachate	5.6	u	UG/L	5.6	1.0
		Arsenic ICLP Leachate	24.6	u	UG/L	24.6	1.0
		Barium ICLP Leachate	3.0	u	UG/L	3.0	1.0
		Cadmium ICLP Leachate	4.2	u	UG/L	4.2	1.0
		Chromium, ICLP Leachate	6.4	u	UG/L	6.4	1.0
		Lead, ICLP Leachate	26.0	u	UG/L	26.0	1.0
		Selenium, ICLP Leachate	36.5	u	UG/L	36.5	1.0
BLANK1	06C0114-MB1	Mercury Total	0.10	u	UG/L	0.10	1.0
BLANK2	06C0114-MB2	Mercury ICLP Leachate	0.10	u	UG/L	0.10	1.0

Lionville Laboratory Inc

INORGANICS ACCURACY REPORT 06/08/06

CLIENT: BECHTEL NEVADA V2685 LVL LOT #: 0605L134

WORK ORDER: 60052-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-009	SWMHZ00213	Mercury, ICLP Leachate	195	0 10u	200	97 3	50 0
-016	SWMHZ00220	Silver ICLP Leachate	3750	5 6 u	5000	75 1	1 0
		Silver ICLP Leachate	3500	5 6 u	5000	70 0	1 0
		Arsenic ICLP Leachate	4130	24 6 u	5000	82 6	1 0
		Arsenic ICLP Leachate	4070	24 6 u	5000	81 5	1 0
		Barium ICLP Leachate	74700	168	100000	74 6	1 0
		Barium ICLP Leachate	74800	168	100000	74 6	1 0
		Cadmium, ICLP Leachate	833	4 2 u	1000	83 3	1 0
		Cadmium, ICLP Leachate	822	4 2 u	1000	82 2	1 0
		Chromium, ICLP Leachat	4000	6 4 u	5000	80 1	1 0
		Chromium, ICLP Leachat	3960	6 4 u	5000	79 3	1 0
		Lead ICLP Leachate	4110	26 0 u	5000	82 3	1 0
		Lead ICLP Leachate	4060	26 0 u	5000	81 2	1 0
		Selenium ICLP Leachat	772	36 5 u	1000	77 2	1 0
		Selenium, ICLP Leachat	801	36 5 u	1000	80 1	1 0

Lionville Laboratory Inc

INORGANICS DUPLICATE SPIKE REPORT 06/08/06

CLIENT: BECHTEL NEVADA V2695 LVL LOT #: 06051134

WORK ORDER: 60552-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-016	SWMHZ00220	Silver ICLP Leachate	75 1	70 0	7 1
		Arsenic ICLP Leachate	82 6	81 5	1 4
		Barium, ICLP Leachate	74 6	74 6	0 001
		Cadmium ICLP Leachate	83 3	82 2	1 4
		Chromium, ICLP Leachate	80 1	79 2	0 99
		Lead ICLP Leachate	82 3	81 2	1 3
		Selenium, ICLP Leachate	77 2	80 1	3 6

Lionville Laboratory Inc

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/08/06

CLIENT: BECHTEL NEVADA V2605 IVI LOT #: 0605L134

WORK ORDER: 60052-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
ICS1	06L0349-IC1	Silver, ICS	490	500	UG/L	98 0
		Arsenic LCS	10100	10000	UG/L	100 8
		Barium LCS	4920	5000	UG/L	98 4
		Cadmium ICS	244	250	UG/L	97 5
		Chromium ICS	486	500	UG/L	97 1
		Lead LCS	2360	2500	UG/L	94 3
		Selenium ICS	10100	10000	UG/L	100 7
ICS1	06C0114-LC1	Mercury LCS	5 1	5 0	UG/L	102 8

CHAIN OF CUSTODY RECORD

Environmental Technical Services

SDG #: V2686

Chain of Custody No:	0605/H0060/GEL	Laboratory:	GEL28524
Sampling Event:	0605/SWMHZ/2006-H0060	BN Record Owner:	SWMHZ
EIR ID:	0605/SWMHZ/TEST CELL C	Charge Code:	5B1A15D6
Collected By:			

Requested Analysis: 163698%

Sample ID	Sample Matrix	Collection Date Time	Filtered	LEVELS Anal.	LEVELS Priority	Pay Item	Description	Comments
SWMHZ00213	SO	5/18/06 @ 1356	U	CMP	14	NAS-A-002	ISOTOPIC URANIUM, 0.02 PCI/G MDA	
			U	CMP	14	NAS-A-006	ISOTOPIC PLUTONIUM, 0.02 PCI/G MDA	
			U	CMP	14	NGS-A-002	GAMMA SPECTROSCOPY, 1 PCI/G CS-137 MDA	
SWMHZ00214	SO	@ 1404	U	CMP	14	NAS-A-002	ISOTOPIC URANIUM, 0.02 PCI/G MDA	
			U	CMP	14	NAS-A-006	ISOTOPIC PLUTONIUM, 0.02 PCI/G MDA	
			U	CMP	14	NGS-A-002	GAMMA SPECTROSCOPY, 1 PCI/G CS-137 MDA	
SWMHZ00215	SO	@ 1415	U	CMP	14	NAS-A-002	ISOTOPIC URANIUM, 0.02 PCI/G MDA	
			U	CMP	14	NAS-A-006	ISOTOPIC PLUTONIUM, 0.02 PCI/G MDA	
			U	CMP	14	NGS-A-002	GAMMA SPECTROSCOPY, 1 PCI/G CS-137 MDA	
SWMHZ00216	SO	@ 1430	U	CMP	14	NAS-A-002	ISOTOPIC URANIUM, 0.02 PCI/G MDA	
			U	CMP	14	NAS-A-006	ISOTOPIC PLUTONIUM, 0.02 PCI/G MDA	
			U	CMP	14	NGS-A-002	GAMMA SPECTROSCOPY, 1 PCI/G CS-137 MDA	
SWMHZ00217	SO	@ 1535	U	CMP	14	NAS-A-002	ISOTOPIC URANIUM, 0.02 PCI/G MDA	
			U	CMP	14	NAS-A-006	ISOTOPIC PLUTONIUM, 0.02 PCI/G MDA	
			U	CMP	14	NGS-A-002	GAMMA SPECTROSCOPY, 1 PCI/G CS-137 MDA	
SWMHZ00218	SO	@ 1543	U	CMP	14	NAS-A-002	ISOTOPIC URANIUM, 0.02 PCI/G MDA	
			U	CMP	14	NAS-A-006	ISOTOPIC PLUTONIUM, 0.02 PCI/G MDA	
			U	CMP	14	NGS-A-002	GAMMA SPECTROSCOPY, 1 PCI/G CS-137 MDA	
SWMHZ00219	SO	@ 1547	U	CMP	14	NAS-A-002	ISOTOPIC URANIUM, 0.02 PCI/G MDA	
			U	CMP	14	NAS-A-006	ISOTOPIC PLUTONIUM, 0.02 PCI/G MDA	

ain of Custody No: 0605/H0060/GEL

Requested Analysis:

Sample ID	Sample Matrix	Collection Date Time	Filtered	LEVELS Anal.	Priority	Pay Item	Description	Comments
		5/18/06 @ 1547	U	CMP	14	NGS-A-002	GAMMA SPECTROSCOPY, 1 PCI/G CS-137 MDA	
SWMHZ00220	SO	@ 1550	U	CMP	14	NAS-A-002	ISOTOPIC URANIUM, 0.02 PCI/G MDA	
			U	CMP	14	NAS-A-006	ISOTOPIC PLUTONIUM, 0.02 PCI/G MDA	
			U	CMP	14	NGS-A-002	GAMMA SPECTROSCOPY, 1 PCI/G CS-137 MDA	

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Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: SWMHZ00213 Project: NEVA00101
Sample ID: 163698001 Client ID: NEVA002
Matrix: Soil
Collect Date: 18–MAY–06
Receive Date: 25–MAY–06
Collector: Client

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mt
Rad Alpha Spec Analysis													
Alphaspec Pu, Solid													
Plutonium–238	U	0.00279	+/–0.00547	0.00837	+/–0.00547	0.020	pCi/g		MXA 1	06/21/06	1324	540540	
Plutonium–239/240	U	0.00	+/–0.00546	0.00836	+/–0.00546	0.020	pCi/g						
Alphaspec U, Solid													
Uranium–233/234		2.00	+/–0.111	0.00483	+/–0.251	0.020	pCi/g		MXA 1	06/15/06	1617	536377	
Uranium–235/236		0.153	+/–0.0342	0.00597	+/–0.0383	0.020	pCi/g						
Uranium–238		0.744	+/–0.0679	0.00483	+/–0.108	0.020	pCi/g						
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid													
Actinium–228		1.57	+/–0.215	0.155	+/–0.219		pCi/g		MJH1	06/13/06	0624	533737	
Americium–241	U	0.00103	+/–0.121	0.205	+/–0.123	0.200	pCi/g						
Antimony–125	U	–0.0925	+/–0.0943	0.146	+/–0.0962		pCi/g						
Cerium–144	U	0.0811	+/–0.150	0.277	+/–0.154		pCi/g						
Cesium–134	X	*0.0716*	+/–0.0449	0.0472	+/–0.0458	*0.100*	pCi/g						
Cesium–137		6.99	+/–0.152	0.0499	+/–0.159	1.00	pCi/g						
Cobalt–60	U	0.0393	+/–0.0316	0.0489	+/–0.0323		pCi/g						
Europium–152		0.849	+/–0.138	0.143	+/–0.141		pCi/g						
Europium–154	U	0.123	+/–0.0801	0.162	+/–0.0817		pCi/g						
Europium–155	X	0.163	+/–0.104	0.153	+/–0.106		pCi/g						
Lead–212		1.49	+/–0.0852	0.0754	+/–0.0872		pCi/g						
Potassium–40		31.7	+/–1.27	0.343	+/–1.31		pCi/g						
Promethium–144	U	0.0118	+/–0.0226	0.0418	+/–0.023		pCi/g						
Promethium–146	U	–0.0104	+/–0.0406	0.0733	+/–0.0414		pCi/g						
Ruthenium–106	U	0.173	+/–0.254	0.378	+/–0.259		pCi/g						
Thorium–234	U	0.823	+/–1.35	1.56	+/–1.38		pCi/g						
Uranium–235		0.483	+/–0.258	0.297	+/–0.264	0.200	pCi/g						
Uranium–238	U	0.823	+/–1.35	1.56	+/–1.38	2.00	pCi/g						
Yttrium–88	U	–0.0244	+/–0.0229	0.036	+/–0.0234		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL–RAD–A–021B	AXP2	05/30/06	1519	533869
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	LXM2	05/28/06	1016	533732

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: SWMHZ00213 Project: NEVA00101
Sample ID: 163698001 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst Date	Time	Batch	M

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EML HASL 300, 4.5.2.3

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Plutonium-242	Alphaspec Pu, Solid	81	(15%-125%)
Uranium-232	Alphaspec U, Solid	74	(25%-125%)

Notes:
The Qualifiers in this report are defined as follows :

* A quality control analyte recovery is outside of specified acceptance criteria
< Result is less than value reported
> Result is greater than value reported
A The TIC is a suspected aldol-condensation product
B Target analyte was detected in the associated blank
BD Results are either below the MDC or tracer recovery is low
C Analyte has been confirmed by GC/MS analysis
D Results are reported from a diluted aliquot of the sample
H Analytical holding time was exceeded
J Value is estimated
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
R Sample results are rejected
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI Gamma Spectroscopy—Uncertain identification
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y QC Samples were not spiked with this compound
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

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Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	SWMHZ00214	Project:	NEVA00101
Sample ID:	163698002	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	18–MAY–06		
Receive Date:	25–MAY–06		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M
Rad Alpha Spec Analysis													
Alphaspec Pu, Solid													
Plutonium–238	U	0.00164	+/–0.00727	0.0209	+/–0.00727	0.020	pCi/g		MXA I	06/21/06	1324	540540	
Plutonium–239/240	U	0.00662	+/–0.00917	0.00993	+/–0.0092	0.020	pCi/g						
Alphaspec U, Solid													
Uranium–233/234		1.39	+/–0.0962	0.0132	+/–0.184	0.020	pCi/g		MXA I	06/15/06	1617	536377	
Uranium–235/236		0.0962	+/–0.0281	0.00641	+/–0.0301	0.020	pCi/g						
Uranium–238		0.730	+/–0.070	0.0166	+/–0.108	0.020	pCi/g						
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid													
Actinium–228		1.42	+/–0.233	0.180	+/–0.237		pCi/g		MJH1	06/13/06	0625	533737	
Americium–241	U	0.0178	+/–0.148	0.255	+/–0.152	0.200	pCi/g						
Antimony–125	U	0.0453	+/–0.0604	0.114	+/–0.0616		pCi/g						
Cerium–144	U	0.028	+/–0.147	0.241	+/–0.150		pCi/g						
Cesium–134	X	0.0689	+/–0.0446	0.0546	+/–0.0455	0.100	pCi/g						
Cesium–137		0.246	+/–0.0476	0.0462	+/–0.0486	1.00	pCi/g						
Cobalt–60	U	0.00265	+/–0.0284	0.0514	+/–0.029		pCi/g						
Europium–152		0.644	+/–0.115	0.115	+/–0.117		pCi/g						
Europium–154	U	–0.0163	+/–0.113	0.171	+/–0.116		pCi/g						
Europium–155	U	0.0666	+/–0.0977	0.137	+/–0.0997		pCi/g						
Lead–212		1.65	+/–0.0814	0.0662	+/–0.0835		pCi/g						
Potassium–40		34.9	+/–1.44	0.393	+/–1.48		pCi/g						
Promethium–144	U	–0.00487	+/–0.0242	0.0421	+/–0.0247		pCi/g						
Promethium–146	U	0.00928	+/–0.0306	0.0561	+/–0.0312		pCi/g						
Ruthenium–106	U	–0.0831	+/–0.222	0.385	+/–0.226		pCi/g						
Thorium–234	X	1.94	+/–1.89	1.92	+/–1.93		pCi/g						
Uranium–235	U	0.030	+/–0.142	0.258	+/–0.145	0.200	pCi/g						
Uranium–238	X	1.94	+/–1.89	1.92	+/–1.93	2.00	pCi/g						
Yttrium–88	U	0.00884	+/–0.0269	0.0526	+/–0.0275		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL–RAD–A–021B	AXP2	05/30/06	1519	533869
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	LXM2	05/28/06	1016	533732

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Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: SWMHZ00214 Project: NEVA00101
Sample ID: 163698002 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mt

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EML HASL 300, 4.5.2.3

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Plutonium-242	Alphaspec Pu, Solid	71	(15%-125%)
Uranium-232	Alphaspec U, Solid	67	(25%-125%)

Notes:
The Qualifiers in this report are defined as follows :

* A quality control analyte recovery is outside of specified acceptance criteria
< Result is less than value reported
> Result is greater than value reported
A The TIC is a suspected aldol-condensation product
B Target analyte was detected in the associated blank
BD Results are either below the MDC or tracer recovery is low
C Analyte has been confirmed by GC/MS analysis
D Results are reported from a diluted aliquot of the sample
H Analytical holding time was exceeded
J Value is estimated
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
R Sample results are rejected
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI Gamma Spectroscopy--Uncertain identification
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y QC Samples were not spiked with this compound
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

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Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	SWMHZ00215	Project:	NEVA00101
Sample ID:	163698003	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	18-MAY-06		
Receive Date:	25-MAY-06		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M
Rad Alpha Spec Analysis													
Alphaspec Pu, Solid													
Plutonium-238	U	-0.00175	+/-0.00759	0.0218	+/-0.00759	0.020	pCi/g		MXA I	06/21/06	1324	540540	
Plutonium-239/240	U	0.00345	+/-0.00677	0.0104	+/-0.00678	0.020	pCi/g						
Alphaspec U, Solid													
Uranium-233/234		1.14	+/-0.0911	0.0207	+/-0.159	0.020	pCi/g		MXA I	06/15/06	1617	536377	
Uranium-235/236		0.0809	+/-0.0275	0.0177	+/-0.029	0.020	pCi/g						
Uranium-238		0.826	+/-0.077	0.00561	+/-0.122	0.020	pCi/g						
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid													
Actinium-228		1.68	+/-0.287	0.177	+/-0.293		pCi/g		MJH1	06/13/06	0625	533737	
Americium-241	U	-0.00378	+/-0.035	0.0645	+/-0.0357	0.200	pCi/g						
Antimony-125	U	0.0145	+/-0.062	0.113	+/-0.0632		pCi/g						
Cerium-144	U	-0.0249	+/-0.129	0.227	+/-0.131		pCi/g						
Cesium-134	X	0.118	+/-0.0548	0.0688	+/-0.0559	0.100	pCi/g						
Cesium-137	U	0.0223	+/-0.028	0.0497	+/-0.0286	1.00	pCi/g						
Cobalt-60	U	0.00551	+/-0.0313	0.0564	+/-0.0319		pCi/g						
Europium-152		0.459	+/-0.0996	0.114	+/-0.102		pCi/g						
Europium-154	U	0.0799	+/-0.0991	0.184	+/-0.101		pCi/g						
Europium-155	U	0.107	+/-0.0936	0.109	+/-0.0956		pCi/g						
Lead-212		1.58	+/-0.192	0.0708	+/-0.196		pCi/g						
Potassium-40		32.2	+/-2.29	0.436	+/-2.34		pCi/g						
Promethium-144	U	0.00814	+/-0.026	0.0462	+/-0.0265		pCi/g						
Promethium-146	U	0.00107	+/-0.0281	0.0507	+/-0.0287		pCi/g						
Ruthenium-106	U	0.0343	+/-0.247	0.437	+/-0.252		pCi/g						
Thorium-234		0.839	+/-0.665	0.637	+/-0.679		pCi/g						
Uranium-235	U	0.229	+/-0.238	0.245	+/-0.243	0.200	pCi/g						
Uranium-238		0.839	+/-0.665	0.637	+/-0.679	2.00	pCi/g						
Yttrium-88	X	0.0388	+/-0.0192	0.0361	+/-0.0196		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL-RAD-A-021B	AXP2	05/30/06	1519	533869
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	05/28/06	1016	533732

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Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: SWMHZ00215 Project: NEVA00101
Sample ID: 163698003 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EML HASL 300, 4.5.2.3

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Plutonium-242	Alphaspec Pu, Solid	67	(15%-125%)
Uranium-232	Alphaspec U, Solid	65	(25%-125%)

Notes:
The Qualifiers in this report are defined as follows :

* A quality control analyte recovery is outside of specified acceptance criteria
< Result is less than value reported
> Result is greater than value reported
A The TIC is a suspected aldol-condensation product
B Target analyte was detected in the associated blank
BD Results are either below the MDC or tracer recovery is low
C Analyte has been confirmed by GC/MS analysis
D Results are reported from a diluted aliquot of the sample
H Analytical holding time was exceeded
J Value is estimated
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
R Sample results are rejected
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI Gamma Spectroscopy—Uncertain identification
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y QC Samples were not spiked with this compound
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

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Company : Bechtel Nevada
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Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	SWMHZ00216	Project:	NEVA00101
Sample ID:	163698004	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	18–MAY–06		
Receive Date:	25–MAY–06		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M
Rad Alpha Spec Analysis													
Alphaspec Pu, Solid													
Plutonium–238	U	–0.00131	+/–0.00571	0.0164	+/–0.00572	0.020	pCi/g		MXA I	06/21/06	1324	540540	
Plutonium–239/240	U	0.0026	+/–0.0051	0.0078	+/–0.0051	0.020	pCi/g						
Alphaspec U, Solid													
Uranium–233/234		1.05	+/–0.0826	0.0129	+/–0.144	0.020	pCi/g		MXA I	06/19/06	1747	536377	
Uranium–235/236		0.112	+/–0.030	0.00624	+/–0.0325	0.020	pCi/g						
Uranium–238		0.738	+/–0.0691	0.00505	+/–0.108	0.020	pCi/g						
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid													
Actinium–228		1.61	+/–0.209	0.166	+/–0.213		pCi/g		MJH1	06/13/06	0625	533737	
Americium–241	U	0.0316	+/–0.110	0.196	+/–0.112	0.200	pCi/g						
Antimony–125	U	0.0495	+/–0.0792	0.114	+/–0.0808		pCi/g						
Cerium–144	U	0.0722	+/–0.131	0.249	+/–0.134		pCi/g						
Cesium–134	X	0.0643	+/–0.0379	0.0604	+/–0.0387	0.100	pCi/g						
Cesium–137		0.148	+/–0.0516	0.0485	+/–0.0526	1.00	pCi/g						
Cobalt–60	U	–0.000831	+/–0.0269	0.0495	+/–0.0275		pCi/g						
Europium–152		0.539	+/–0.110	0.126	+/–0.113		pCi/g						
Europium–154	U	0.0317	+/–0.085	0.165	+/–0.0868		pCi/g						
Europium–155	U	0.0415	+/–0.0904	0.124	+/–0.0923		pCi/g						
Lead–212		1.49	+/–0.0809	0.0753	+/–0.0829		pCi/g						
Potassium–40		31.3	+/–1.41	0.341	+/–1.44		pCi/g						
Promethium–144	U	0.0142	+/–0.0233	0.0427	+/–0.0237		pCi/g						
Promethium–146	U	0.0259	+/–0.0305	0.0554	+/–0.0311		pCi/g						
Ruthenium–106	U	–0.0573	+/–0.245	0.387	+/–0.250		pCi/g						
Thorium–234	U	0.524	+/–1.13	1.58	+/–1.15		pCi/g						
Uranium–235	U	0.0354	+/–0.142	0.250	+/–0.145	0.200	pCi/g						
Uranium–238	U	0.524	+/–1.13	1.58	+/–1.15	2.00	pCi/g						
Yttrium–88	U	–0.0146	+/–0.0242	0.0411	+/–0.0247		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL–RAD–A–021B	AXP2	05/30/06	1519	533869
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	LXM2	05/28/06	1016	533732

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Company : Bechtel Nevada
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Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: SWMHZ00216 Project: NEVA00101
Sample ID: 163698004 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst Date	Time	Batch	Mt

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL–300, Pu–11–RC Modified
2	DOE EML HASL–300, Pu–11–RC Modified
3	DOE EML HASL–300, U–02–RC Modified
4	EML HASL 300, 4.5.2.3

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Plutonium–242	Alphaspec Pu, Solid	87	(15%–125%)
Uranium–232	Alphaspec U, Solid	70	(25%–125%)

Notes:
The Qualifiers in this report are defined as follows :

* A quality control analyte recovery is outside of specified acceptance criteria
< Result is less than value reported
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A The TIC is a suspected aldol–condensation product
B Target analyte was detected in the associated blank
BD Results are either below the MDC or tracer recovery is low
C Analyte has been confirmed by GC/MS analysis
D Results are reported from a diluted aliquot of the sample
H Analytical holding time was exceeded
J Value is estimated
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
R Sample results are rejected
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI Gamma Spectroscopy—Uncertain identification
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y QC Samples were not spiked with this compound
^ RPD of sample and duplicate evaluated using +/–RL. Concentrations are <5X the RL
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

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Company : Bechtel Nevada
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Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	SWMHZ00217	Project:	NEVA00101
Sample ID:	163698005	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	18-MAY-06		
Receive Date:	25-MAY-06		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M
Rad Alpha Spec Analysis													
Alphaspec Pu, Solid													
Plutonium-238	U	0.00175	+/-0.00845	0.0244	+/-0.00846	0.020	pCi/g		MXA1	06/21/06	1324	540540	
Plutonium-239/240	U	0.00379	+/-0.00743	0.0114	+/-0.00744	0.020	pCi/g						
Alphaspec U, Solid													
Uranium-233/234		0.829	+/-0.0761	0.0173	+/-0.121	0.020	pCi/g		MXA1	06/15/06	1617	536377	
Uranium-235/236		0.069	+/-0.0251	0.017	+/-0.0263	0.020	pCi/g						
Uranium-238		0.629	+/-0.0662	0.0138	+/-0.0973	0.020	pCi/g						
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid													
Actinium-228		1.59	+/-0.187	0.159	+/-0.191		pCi/g		MJH1	06/13/06	0626	533737	
Americium-241	U	0.0252	+/-0.107	0.181	+/-0.109	0.200	pCi/g						
Antimony-125	U	0.0451	+/-0.0595	0.109	+/-0.0607		pCi/g						
Cerium-144	U	-0.0825	+/-0.132	0.231	+/-0.135		pCi/g						
Cesium-134	X	0.0993	+/-0.0379	0.0592	+/-0.0386	0.100	pCi/g						
Cesium-137	U	-0.00691	+/-0.0262	0.0466	+/-0.0268	1.00	pCi/g						
Cobalt-60	U	0.022	+/-0.0271	0.0519	+/-0.0277		pCi/g						
Europium-152		0.329	+/-0.110	0.112	+/-0.112		pCi/g						
Europium-154	U	0.0281	+/-0.0838	0.154	+/-0.0855		pCi/g						
Europium-155	U	0.0367	+/-0.0676	0.124	+/-0.0689		pCi/g						
Lead-212		1.44	+/-0.078	0.0688	+/-0.0799		pCi/g						
Potassium-40		32.4	+/-1.30	0.373	+/-1.34		pCi/g						
Promethium-144	U	-0.00561	+/-0.0237	0.0421	+/-0.0242		pCi/g						
Promethium-146	U	0.0329	+/-0.0283	0.0528	+/-0.0289		pCi/g						
Ruthenium-106	U	0.209	+/-0.246	0.399	+/-0.251		pCi/g						
Thorium-234		1.59	+/-1.45	1.48	+/-1.48		pCi/g						
Uranium-235	U	0.107	+/-0.131	0.238	+/-0.134	0.200	pCi/g						
Uranium-238		1.59	+/-1.45	1.48	+/-1.48	2.00	pCi/g						
Yttrium-88	U	0.0014	+/-0.0237	0.0395	+/-0.0242		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL-RAD-A-021B	AXP2	05/30/06	1519	533869
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	05/28/06	1016	533732

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Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: SWMHZ00217 Project: NEVA00101
Sample ID: 163698005 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EML HASL 300, 4.5.2.3

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Plutonium-242	Alphaspec Pu, Solid	58	(15%-125%)
Uranium-232	Alphaspec U, Solid	65	(25%-125%)

Notes:
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< Result is less than value reported
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B Target analyte was detected in the associated blank
BD Results are either below the MDC or tracer recovery is low
C Analyte has been confirmed by GC/MS analysis
D Results are reported from a diluted aliquot of the sample
H Analytical holding time was exceeded
J Value is estimated
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
R Sample results are rejected
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI Gamma Spectroscopy--Uncertain identification
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y QC Samples were not spiked with this compound
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

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Company : Bechtel Nevada
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Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	SWMHZ00218	Project:	NEVA00101
Sample ID:	163698006	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	18-MAY-06		
Receive Date:	25-MAY-06		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M
Rad Alpha Spec Analysis													
Alphaspec Pu, Solid													
Plutonium-238	U	0.0015	+/-0.00666	0.0191	+/-0.00666	0.020	pCi/g		MXA I	06/21/06	1324	540540	
Plutonium-239/240	U	0.00	+/-0.00594	0.00909	+/-0.00594	0.020	pCi/g						
Alphaspec U, Solid													
Uranium-233/234		1.04	+/-0.0761	0.0138	+/-0.138	0.020	pCi/g		MXA I	06/15/06	1617	536377	
Uranium-235/236		0.0892	+/-0.0252	0.0137	+/-0.0271	0.020	pCi/g						
Uranium-238		0.745	+/-0.0644	0.011	+/-0.105	0.020	pCi/g						
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid													
Actinium-228		1.58	+/-0.192	0.135	+/-0.196		pCi/g		MJH1	06/13/06	0626	533737	
Americium-241	U	0.00408	+/-0.126	0.171	+/-0.129	0.200	pCi/g						
Antimony-125	U	0.089	+/-0.0605	0.0931	+/-0.0618		pCi/g						
Cerium-144	U	-0.116	+/-0.120	0.211	+/-0.123		pCi/g						
Cesium-134	X	0.0549	+/-0.0323	0.0544	+/-0.0329	0.100	pCi/g						
Cesium-137		0.0689	+/-0.0475	0.0439	+/-0.0484	1.00	pCi/g						
Cobalt-60	U	-0.00533	+/-0.0303	0.0456	+/-0.0309		pCi/g						
Europium-152		0.525	+/-0.106	0.107	+/-0.108		pCi/g						
Europium-154	U	0.126	+/-0.140	0.156	+/-0.143		pCi/g						
Europium-155	X	0.115	+/-0.0971	0.111	+/-0.0991		pCi/g						
Lead-212		1.45	+/-0.0717	0.0594	+/-0.0735		pCi/g						
Potassium-40		32.9	+/-1.25	0.339	+/-1.28		pCi/g						
Promethium-144	U	-0.025	+/-0.0255	0.036	+/-0.0261		pCi/g						
Promethium-146	U	0.00354	+/-0.025	0.0456	+/-0.0255		pCi/g						
Ruthenium-106	U	0.138	+/-0.237	0.340	+/-0.241		pCi/g						
Thorium-234	U	0.314	+/-1.27	1.38	+/-1.30		pCi/g						
Uranium-235	U	0.133	+/-0.188	0.232	+/-0.192	0.200	pCi/g						
Uranium-238	U	0.314	+/-1.27	1.38	+/-1.30	2.00	pCi/g						
Yttrium-88	U	-0.00197	+/-0.0193	0.0363	+/-0.0197		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL-RAD-A-021B	AXP2	05/30/06	1519	533869
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	05/28/06	1016	533732

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Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: SWMHZ00218 Project: NEVA00101
Sample ID: 163698006 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst Date	Time	Batch	M

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EML HASL 300, 4.5.2.3

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Plutonium-242	Alphaspec Pu, Solid	76	(15%-125%)
Uranium-232	Alphaspec U, Solid	79	(25%-125%)

Notes:
The Qualifiers in this report are defined as follows :

* A quality control analyte recovery is outside of specified acceptance criteria
< Result is less than value reported
> Result is greater than value reported
A The TIC is a suspected aldol-condensation product
B Target analyte was detected in the associated blank
BD Results are either below the MDC or tracer recovery is low
C Analyte has been confirmed by GC/MS analysis
D Results are reported from a diluted aliquot of the sample
H Analytical holding time was exceeded
J Value is estimated
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
R Sample results are rejected
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI Gamma Spectroscopy—Uncertain identification
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y QC Samples were not spiked with this compound
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

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Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	SWMHZ00219	Project:	NEVA00101
Sample ID:	163698007	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	18-MAY-06		
Receive Date:	25-MAY-06		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mt
Rad Alpha Spec Analysis													
Alphaspec Pu, Solid													
Plutonium-238	U	0.00533	+/-0.00739	0.008	+/-0.00741	0.020	pCi/g		MXA I	06/21/06	1324	540540	
Plutonium-239/240	U	0.00	+/-0.00522	0.00799	+/-0.00522	0.020	pCi/g						
Alphaspec U, Solid													
Uranium-233/234		0.933	+/-0.0907	0.0175	+/-0.142	0.020	pCi/g		MXA I	06/15/06	1617	536377	
Uranium-235/236		0.0705	+/-0.0276	0.00846	+/-0.0289	0.020	pCi/g						
Uranium-238		0.730	+/-0.0805	0.0219	+/-0.117	0.020	pCi/g						
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid													
Actinium-228		1.54	+/-0.258	0.158	+/-0.264		pCi/g		MJH1	06/13/06	0627	533737	
Americium-241	U	-0.0229	+/-0.122	0.231	+/-0.124	0.200	pCi/g						
Antimony-125	U	0.0022	+/-0.053	0.0967	+/-0.0541		pCi/g						
Cerium-144	U	0.00519	+/-0.119	0.217	+/-0.121		pCi/g						
Cesium-134	X	0.132	+/-0.0519	0.0602	+/-0.0529	0.100	pCi/g						
Cesium-137	U	0.0227	+/-0.0305	0.0417	+/-0.0312	1.00	pCi/g						
Cobalt-60	U	0.0261	+/-0.0265	0.0503	+/-0.027		pCi/g						
Europium-152		0.444	+/-0.113	0.108	+/-0.115		pCi/g						
Europium-154	U	0.00829	+/-0.087	0.154	+/-0.0887		pCi/g						
Europium-155	U	0.0434	+/-0.066	0.124	+/-0.0674		pCi/g						
Lead-212		1.51	+/-0.141	0.0637	+/-0.143		pCi/g						
Potassium-40		33.7	+/-2.46	0.317	+/-2.51		pCi/g						
Promethium-144	U	0.00878	+/-0.0229	0.0408	+/-0.0233		pCi/g						
Promethium-146	U	0.00602	+/-0.0252	0.0462	+/-0.0257		pCi/g						
Ruthenium-106	U	-0.0384	+/-0.199	0.349	+/-0.203		pCi/g						
Thorium-234	U	0.675	+/-1.32	1.78	+/-1.35		pCi/g						
Uranium-235	U	0.0386	+/-0.118	0.216	+/-0.121	0.200	pCi/g						
Uranium-238	U	0.675	+/-1.32	1.78	+/-1.35	2.00	pCi/g						
Yttrium-88	U	-0.00414	+/-0.0233	0.0365	+/-0.0237		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL-RAD-A-021B	AXP2	05/30/06	1519	533869
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	05/28/06	1016	533732

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Company : Bechtel Nevada
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Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Report Date: June 22, 2006

Client Sample ID: SWMHZ00219
Sample ID: 163698007

Project: NEVA00101
Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mt

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EML HASL 300, 4.5.2.3

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Plutonium-242	Alphaspec Pu, Solid	89	(15%-125%)
Uranium-232	Alphaspec U, Solid	50	(25%-125%)

Notes:
The Qualifiers in this report are defined as follows :

* A quality control analyte recovery is outside of specified acceptance criteria
< Result is less than value reported
> Result is greater than value reported
A The TIC is a suspected aldol-condensation product
B Target analyte was detected in the associated blank
BD Results are either below the MDC or tracer recovery is low
C Analyte has been confirmed by GC/MS analysis
D Results are reported from a diluted aliquot of the sample
H Analytical holding time was exceeded
J Value is estimated
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
R Sample results are rejected
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI Gamma Spectroscopy--Uncertain identification
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y QC Samples were not spiked with this compound
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	SWMHZ00220	Project:	NEVA00101
Sample ID:	163698008	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	18-MAY-06		
Receive Date:	25-MAY-06		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mt
Rad Alpha Spec Analysis													
Alphaspec Pu, Solid													
Plutonium-238	U	0.00	+/-0.00524	0.00802	+/-0.00524	0.020	pCi/g	1	MXA	06/21/06	1324	540540	
Plutonium-239/240	U	0.00534	+/-0.0074	0.00801	+/-0.00742	0.020	pCi/g						
Alphaspec U, Solid													
Uranium-233/234		1.09	+/-0.121	0.0331	+/-0.183	0.020	pCi/g	1	MXA	06/15/06	1617	536377	
Uranium-235/236		0.115	+/-0.0435	0.0128	+/-0.0458	0.020	pCi/g						
Uranium-238		0.749	+/-0.0997	0.0104	+/-0.137	0.020	pCi/g						
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid													
Actinium-228		1.40	+/-0.214	0.142	+/-0.219		pCi/g		MJH1	06/13/06	0627	533737	
Americium-241	U	0.0911	+/-0.106	0.182	+/-0.108	0.200	pCi/g						
Antimony-125	U	0.0285	+/-0.0505	0.102	+/-0.0516		pCi/g						
Cerium-144	U	-0.0825	+/-0.134	0.244	+/-0.137		pCi/g						
Cesium-134	U	0.0388	+/-0.0447	0.0441	+/-0.0456	0.100	pCi/g						
Cesium-137	U	0.0414	+/-0.0387	0.0439	+/-0.0394	1.00	pCi/g						
Cobalt-60	U	0.00417	+/-0.0246	0.0441	+/-0.0251		pCi/g						
Europium-152		0.389	+/-0.110	0.115	+/-0.112		pCi/g						
Europium-154	U	0.0681	+/-0.0924	0.147	+/-0.0943		pCi/g						
Europium-155	U	0.104	+/-0.0831	0.123	+/-0.0848		pCi/g						
Lead-212		1.47	+/-0.0735	0.0642	+/-0.0753		pCi/g						
Potassium-40		31.2	+/-1.18	0.346	+/-1.22		pCi/g						
Promethium-144	U	0.0198	+/-0.0221	0.0418	+/-0.0226		pCi/g						
Promethium-146	U	-0.00037	+/-0.0314	0.0479	+/-0.0321		pCi/g						
Ruthenium-106	U	-0.224	+/-0.202	0.348	+/-0.206		pCi/g						
Thorium-234		1.49	+/-1.30	1.48	+/-1.33		pCi/g						
Uranium-235		0.420	+/-0.218	0.248	+/-0.223	0.200	pCi/g						
Uranium-238		1.49	+/-1.30	1.48	+/-1.33	2.00	pCi/g						
Yttrium-88	U	-0.00331	+/-0.0206	0.038	+/-0.021		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL-RAD-A-021B	AXP2	05/30/06	1519	533869
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	05/28/06	1016	533732

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: June 22, 2006
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: SWMHZ00220 Project: NEVA00101
Sample ID: 163698008 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Pu-11-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EML HASL 300, 4.5.2.3

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Plutonium-242	Alphaspec Pu, Solid	87	(15%-125%)
Uranium-232	Alphaspec U, Solid	34	(25%-125%)

Notes:
The Qualifiers in this report are defined as follows :

* A quality control analyte recovery is outside of specified acceptance criteria
< Result is less than value reported
> Result is greater than value reported
A The TIC is a suspected aldol-condensation product
B Target analyte was detected in the associated blank
BD Results are either below the MDC or tracer recovery is low
C Analyte has been confirmed by GC/MS analysis
D Results are reported from a diluted aliquot of the sample
H Analytical holding time was exceeded
J Value is estimated
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
R Sample results are rejected
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI Gamma Spectroscopy—Uncertain identification
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y QC Samples were not spiked with this compound
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

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APPENDIX C

WASTE DISPOSITION DOCUMENTATION

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Bechtel Nevada

NTS LANDFILL LOAD VERIFICATION

(Waste definitions are available on page 2)

SWO USE (Select One) AREA ☐ 23 ☐ 6 ☒ 9 ☐ **LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GERERATOR INFORMATION

(This form is for rolloffs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Michael Casselbury Phone Number: 295-9777

Location / Origin: NTS Area 25, Test Cell C, CAU 528

Waste Category: (check one)		☐ Commercial	☒ Industrial	
Waste Type: (check one)	☒ NTS	☐ Putrescrible	☒ FFACO-onsite	☐ WAC Exception
	☐ Non-Putrescible	☐ Asbestos Containing Material	☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one)		☒ Environmental management	☐ Defense Projects	☐ YMP
Pollution Prevention Category: (check one)		☒ Clean-Up 5/23/06	☐ Routine	
Method of Characterization: (check one)		☒ Sampling & Analysis	☐ Process Knowledge	☐ Contents

Prohibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics' kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Asphalt ☒ Metal ☐ Wood ☒ Soil ☐ Rubber (excluding tires) ☐ Demolition debris
☐ Plastic ☐ Wire ☐ Cable ☐ Cloth ☐ Insulation (non-Asbestosform) ☒ Cement & concrete
☐ Paper ☐ Rocks / unaltered geologic materials ☐ Empty containers
☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office Waste ☐ Food Waste ☐ Animal Carcasses
☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos ☐ Drained automobiles and military vehicles ☐ Solid fractions from sand/oil/water separators
☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above Ground Tanks
☐ Hydrocarbons (contact SWO) ☐ Other _____

Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Other _____

☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel) ☐ Crushed non-teme plated oil filters
☐ Plants ☐ Soil ☐ Sludge from sand/oil/water separators ☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: _____ (if initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management A--- (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials tl have verified this through the waste characterization method identified above and a revie and allowable waste items. I have contacted Property Management and have verified tha disposal in the landfill.

Print Name: Michael Casselbury

Signature: Michael Casselbury Date: 5/18/06

Radiological Survey Release for Waste Dispos

RCT Initials

DSR **This container/load meets the criteria added man-made radioactive material**

____ **This container/load meets the criteria Radcon Manual Table 4.2 release limit**

____ **This container/load is exempt from su due to process knowledge and origin.**

SIGNATURE: D.S.R **DATE:** 5

BN-064

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 4,80 Signature of Certifier: Dinny Chavez

BN-0918 (10/05)

Bechtel Nevada

NTS LANDFILL LOAD VERIFICATION

(Waste definitions are available on page 2)

SWO USE (Select One) AREA ☐ 23 ☐ 6 ☒ 9 ☐ **LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GERERATOR INFORMATION

(This form is for rolloffs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Michael Casselbury Phone Number: 5-7222

Location / Origin: Test Cell C Cau 528

Waste Category: (check one)		☐ Commercial	☒ Industrial	
Waste Type: (check one)	☒ NTS	☐ Putrescrible	☒ FFACO-onsite	☐ WAC Exception
	☐ Non-Putrescible	☐ Asbestos Containing Material	☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one)		☒ Environmental management	☐ Defense Projects	☐ YMP
Pollution Prevention Category: (check one)		☒ Clean-Up	☐ Routine	
Method of Characterization: (check one)		☒ Sampling & Analysis	☐ Process Knowledge	☐ Contents

Prohibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics' kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper	☐ Rocks / unaltered geologic materials	☐ Empty containers	☐ Asphalt	☐ Metal	☐ Wood	☒ Soil
☐ Rubber (excluding tires)	☐ Demolition debris	☐ Plastic	☐ Wire	☐ Cable	☐ Cloth	☐ Insulation (non-Asbestosform)
☒ Cement & concrete	☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)					

Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office Waste ☐ Food Waste ☐ Animal Carcasses

☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos	☐ Drained automobiles and military vehicles	☐ Solid fractions from sand/oil/water separators
☐ Light ballasts (contact SWO)	☐ Drained fuel filters (gas & diesel)	☐ Deconned Underground and Above Ground Tanks
☐ Hydrocarbons (contact SWO)	☐ Other _____	

Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Other _____

☐ Septic sludge	☐ Rags	☐ Drained fuel filters (gas & diesel)	☐ Crushed non-teme plated oil filters
☐ Plants	☐ Soil	☐ Sludge from sand/oil/water separators	☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: _____ (if initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management / (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials t have verified this through the waste characterization method identified above and a revi and allowable waste items. I have contacted Property Management and have verified thi disposal in the landfill.

Print Name: Michael Casselbury

Signature: Michael Casselbury Date: 5/22/06

Radiological Survey Release for Waste Disposal

RCT Initials

MEA **This container/load meets the criteria for no added man-made radioactive material**

____ **This container/load meets the criteria for Radcon Manual Table 4.2 release limits.**

____ **This container/load is exempt from survey due to process knowledge and origin.**

SIGNATURE: A S R **DATE:** 5-22-06

BN-0646 (10/05)

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 16900 Signature of Certifier: Doug Church

BN-0918 (10/05)

(7)

Bechtel Nevada

NTS Landfill Load Verification

(Waste definitions are available on page 2)

SWO USE (Circle One Area) AREA 23 6 (9) LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rolloffs, dump trucks, and other onsite disposal of materials.) 7/86

Waste Generator: Alissa Silvas / Rob Baumert Phone Number: 5682

Location / Origin: CAU 528 Test Cell C 925

Waste Category: (check one)		■ Commercial	☒ Industrial	
Waste Type: (check one)	☒ NTS	☐ Putrescible	☒ FFACO-onsite	☐ WAC Exception
	☐ Non-Putrescible	☐ Asbestos Containing Material	☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one)		☒ Environmental management	☐ Defense Projects	
Pollution Prevention Category: (check one)		☒ Clean-Up	■ Routine	
Method of Characterization: (check one)		☒ Sampling & Analysis	☐ Process Knowledge	☐ Contents

Prohibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste at the Area 9 U10c Landfill: Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Asphalt	☐ Metal	☐ Wood	☒ Soil	☐ Rubber (excluding tires)	☐ Demolition debris	
■ Plastic	☐ Wire	☐ Cable	■ Cloth	☐ Insulation (non-Asbestosform)	■ Cement & concrete	

☐ Paper ☐ Rocks / unaltered geologic materials ☐ Empty containers

☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office waste ☐ Food Waste ☐ Animal Carcasses

☐ Asbestos: ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos	☐ Drained automobiles and military vehicles	☐ Solid fractions from sand/oil/water separators
☐ Light ballasts (contact SWO)	☐ Drained fuel filters (gas & diesel)	☐ Deconned Underground and Above Ground
☐ Hydrocarbons (contact SWO)		☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

■ Septic sludge	■ Rags	■ Drained fuel filters (gas & diesel)	■ Crushed non-terne plated oil filters
■ Plants		☐ Sludge from sand/oil/water separators	☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: _____ *(If initialed, no radiological clearance is necessary.)*

The above mentioned waste was generated outside of a Controlled Wast knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only t site. I have verified this through the waste characterization method ident prohibited and allowable waste items.

Print Name: Robert Baumert

Signature: Robert Baumert Date: 7/19/06

Radiological Survey Release for Waste Disposal
RCT Initials

_____ **This container/load meets the criteria for no added man-made radioactive material**

JH **This container/load meets the criteria for Radcon Manual Table 4.2 release limits.**

_____ **This container/load is exempt from survey due to process knowledge and origin.**

SIGNATURE: J Houghton **DATE:** 7-20-06

BN-0646 (10/05)

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 16000 Signature of Certifier: [illegible]

BN-0918 (10/00)

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APPENDIX D

USE RESTRICTION DOCUMENTATION

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CAU Use Restriction Information

CAU Number/Description: CAU 528: Polychlorinated Biphenyls Contamination

Applicable CAS Numbers/Descriptions: CAS 25-27-03, Polychlorinated Biphenyls Surface Contamination

Contact (organization/project): NNSA/NSO Federal Sub-Project Director

Surveyed Area (UTM, Zone 11, NAD 27, meters):

AREA 1 POINTS	NORTHING	EASTING
1	4,076,255.352	564401.750
2	4,076,274.231	564410.420
3	4,076,273.130	564413.773
4	4,076,253.884	564404.971

AREA 2 POINTS	NORTHING	EASTING
1	4,076,266.845	564489.738
2	4,076,268.506	564490.001
3	4,076,284.520	564504.361
4	4,076,268.908	564502.378

AREA 3 POINTS	NORTHING	EASTING
1	4076228.504	564498.459
2	4076236.208	564512.742
3	4076219.565	564522.538
4	4076206.434	564522.170
5	4076206.405	564511.947

AREA 4 POINTS	NORTHING	EASTING
1	4076244.039	564386.792
2	4076252.899	564410.607
3	4076194.435	564409.275
4	4076192.305	564391.232

AREA 5 POINTS	NORTHING	EASTING
1	4076214.119	564546.184
2	4076224.533	564554.739
3	4076218.759	564561.367
4	4076209.091	564556.014

AREA 6 POINTS	NORTHING	EASTING
1	4076153.528	564377.835
2	4076151.154	564383.417
3	4076139.374	564379.161
4	4076139.945	564373.795

AREA 8 POINTS	NORTHING	EASTING
1	4076114.864	564342.621
2	4076126.339	564356.029
3	4076124.353	564375.529
4	4076088.791	564366.929
5	4076097.398	564334.819

AREA 9 POINTS	NORTHING	EASTING
1	4076114.563	564545.308
2	4076129.603	564557.896
3	4076122.576	564567.486
4	4076108.025	564557.964

AREA 10 POINTS	NORTHING	EASTING
1	4076073.019	564539.839
2	4076059.056	564556.677
3	4076045.458	564554.428
4	4076058.992	564539.131

AREA 11 POINTS	NORTHING	EASTING
1	4076192.305	564391.232
2	4076194.435	564409.275
3	4076149.890	564410.614
4	4076139.646	564414.009
5	4076122.292	564413.955
6	4076117.756	564410.905
7	4076109.029	564410.941
8	4076109.150	564402.952
9	4076096.060	564404.668
10	4076099.658	564386.638

AREA 12 POINTS	NORTHING	EASTING
1	4076266.265	564432.786
2	4076271.006	564444.661
3	4076264.989	564444.644
4	4076258.453	564434.961

Survey Date: 06/29/2006 **Survey Method (GPS, etc):** GPS

Site Monitoring Requirements: Visual Inspections

Required Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate last Completion Date: N/A

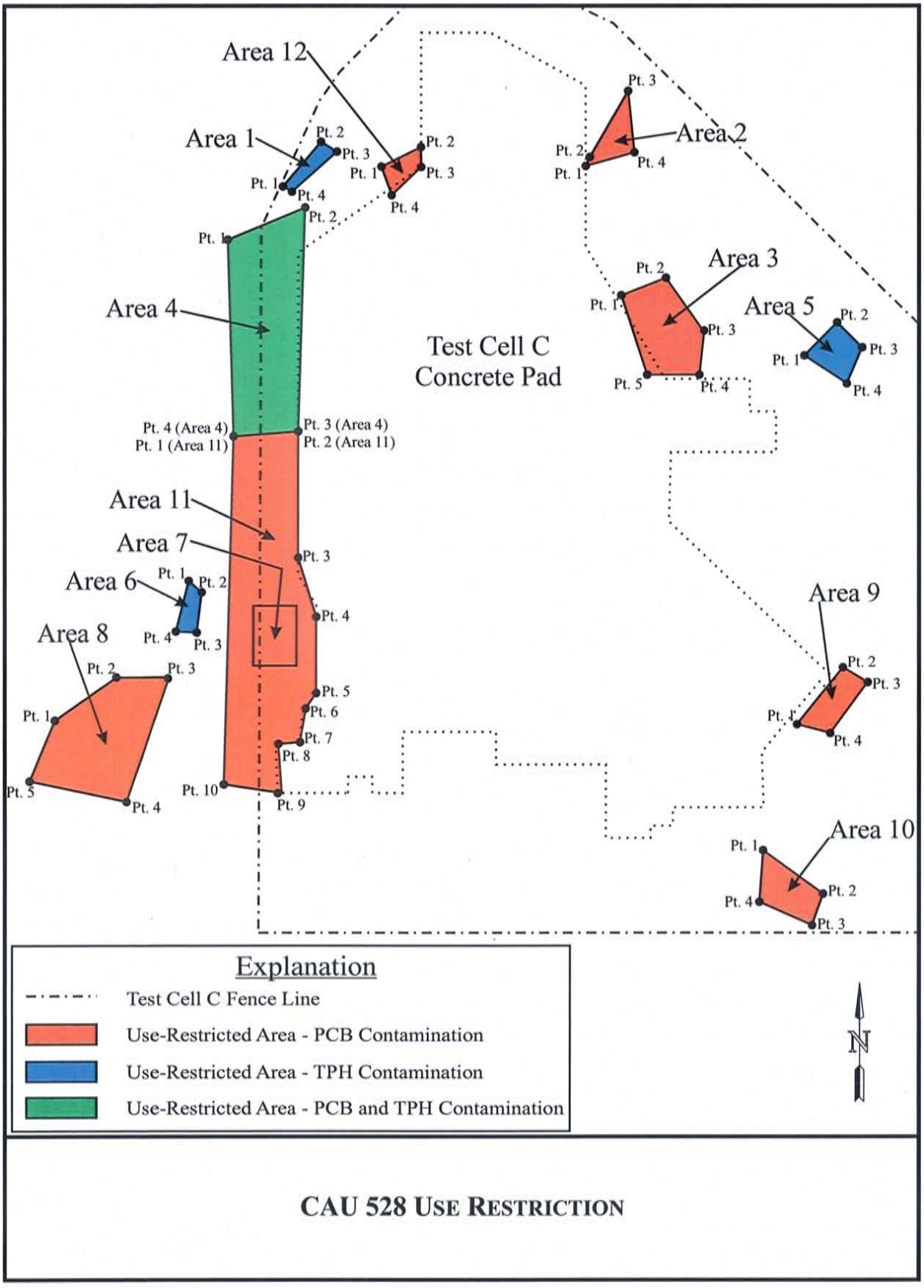
Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the Closure Report for additional information on the condition of the site(s) and any monitoring and/or inspection requirements.

Submitted By: Sabina Curtis **Date:** 9/20/06

cc with copy of survey map (paper and digital (dgn) formats):
CAU Files (2 copies)



CAU 528 USE RESTRICTION

APPENDIX E

SITE CLOSURE PHOTOGRAPHS

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Photograph 1: Area 7A Before Closure Activities, Facing North, 12/04/2002

Photograph 2: Area 7A After Closure Activities, Facing Northeast, 06/29/2006

Photograph 3: Area 7B Before Closure Activities, Facing Southeast, 12/04/2002

Photograph 4: Area 7B After Closure Activities, Facing East, 06/29/2006

PHOTOGRAPH LOG

PHOTOGRAPH NUMBER	DATE	PERSPECTIVE	DESCRIPTION
1	12/04/2002	Facing North	Area 7A Before Closure Activities
2	06/29/2006	Facing Northeast	Area 7A After Closure Activities
3	12/04/2002	Facing Southeast	Area 7B Before Closure Activities
4	06/29/2006	Facing East	Area 7B After Closure Activities

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