Closeout Report for IHSS Group 400-8

UBC 441, IHSS 400-122,
and Portions of IHSS 000-121,
including Tanks T-2 and T-3

March 2004

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Approval received from the Colorado Department of Public Health and Environment

March 19, 2004.

Approval letter contained in the Administrative Record.

March 2004

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ENCLOSURE

Complete Data Set Compact Disc – Accelerated Action and Confirmation Data

ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
AR	Administrative Record
ASD	Analytical Services Division
BG+2SD	background means plus two standard deviations
bgs	below ground surface
BMP	best management practice
CAD/ROD	Corrective Action Decision/Record of Decision
CAS	Chemical Abstract Service
CDPHE	Colorado Department of Public Health and Environment
CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHWA	Colorado Hazardous Waste Act
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
ft	feet
ft^2	square feet
FY	Fiscal Year
HPGe	high-purity germanium
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
K-H	Kaiser-Hill Company, L.L.C.
lb	Pounds
LCS	laboratory control sample
LLMW	low-level mixed waste
LLW	low-level waste
µg/kg (or ug/kg)	micrograms per kilogram
µg/L (or ug/L)	micrograms per liter
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
NA or N/A	not applicable
nCi/g	nanocuries per gram
NFAA	No Further Accelerated Action
NLR	No Longer Representative

ACRONYMS

OPWL	Original Process Waste Lines
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
PAC	Potential Area of Concern
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
PCOC	potential contaminant of concern
POE	Point of Evaluation
ppm	parts per million
QA	quality assurance
QC	quality control
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS (or Site)	Rocky Flats Environmental Technology Site
RI/FS	RCRA Facility Investigation/Remedial Investigation and Corrective Measures Study/Feasibility Study
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
SWD	Soil Water Database
TDS	total dissolved solids
UBC	Under Building Contamination
V&V	verification and validation
VOC	volatile organic compound
WRW	wildlife refuge worker

EXECUTIVE SUMMARY

This Closeout Report summarizes accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 400-8, which is located at the Rocky Flats Environmental Technology Site (RFETS). Activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP), IASAP Addendum #IA-03-01, and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP). Notification of the planned characterization and removal activities was provided in ER RSOP Notification #03-6. The Notification was written and approved using RFCA Tier I and Tier II Action Levels (ALs); however, wildlife refuge worker (WRW) and ecological receptor ALs are used in this Closeout Report.

Activities were conducted from April 7 to May 23, 2003, and November 24 to December 22, 2003, and included soil characterization and the removal of concrete slabs, foundation walls and caissons, drain lines, electrical conduit, and manholes associated with Building 441. Analytical results indicate that all soil concentrations are less than WRW ALs, except for one subsurface arsenic and one subsurface benzo(a)pyrene detection. Concentrations of lead (1 surface and 10 subsurface), beryllium (2 subsurface), and the arsenic mentioned above exceeded the ecological receptor ALs. Results of the Data Quality Assessment (DQA) confirmed that the data collected and used are adequate for decision making.

Removal activities were consistent with and contributed to the ER RSOP overall long-term remedial action objectives (RAOs) for RFETS soil. The removal of concrete items, including manholes and drain lines, contributed to the protection of human health and the environment because potential sources of contamination were removed. These actions also minimized the need for long-term maintenance and institutional or engineering controls. Best management practices (BMPs) were used to prevent the spread of contamination (for example, erosion and dust controls) during work activities.

The Subsurface Soil Risk Screen (SSRS) conducted as part of this accelerated action indicates that no further accelerated action (NFAA) is required. The potential erosion of subsurface soil containing arsenic, beryllium, lead, and benzo(a)pyrene is low. Groundwater will be evaluated in a future decision document.

No IHSS Group-specific, near-term management techniques are required because of environmental conditions. Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process. Restricted access will minimize disturbance to newly revegetated areas. Site access and security controls and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls.

The presence of residual radionuclides, metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs) in soil will be evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and ecological risk assessment portion of the Sitewide Comprehensive Risk Assessment (CRA). The CRA is part of the Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation and Corrective Measures Study/Feasibility

Study (RI/FS) that will be conducted for the Site. The need for, and extent of, any more general or long-term stewardship activities will also be evaluated in the RI/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the Corrective Action Decision/Record of Decision (CAD/ROD), any post-closure Colorado Hazardous Waste Act (CHWA) permit that may be required, and any post-RFCA agreement.

No long-term stewardship activities are recommended for IHSS Group 400-8 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS Group 400-8. In addition no specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS Group 400-8.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR). The specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy.

Approval of this Closeout Report constitutes regulatory agency concurrence that this IHSS Group is an NFAA Site. An NFAA decision is justified based on the following:

- No further accelerated action required based on soil data;
- No further accelerated action required based on the SSRS; and
- No further accelerated action required based on the stewardship evaluation.

This information and NFAA determination will be documented in the Fiscal Year (FY) 04 Historical Release Report (HRR).

1.0 INTRODUCTION

This Closeout Report summarizes the characterization and accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 400-8 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group 400-8 consists of the following Under Building Contamination (UBC) Site and IHSSs:

- UBC 441, Office Building;
- IHSS 400-122, Underground Concrete Tank;
- IHSS 000-121, Original Process Waste Lines (OPWL) Tank T-2, Concrete Waste Storage Tank; and
- IHSS 000-121, OPWL Tank T-3, Concrete Waste and Steel Waste Storage Tanks.

The general location of IHSS Group 400-8 at RFETS is shown on Figure 1, and the UBC Site and IHSSs are shown on Figure 2.

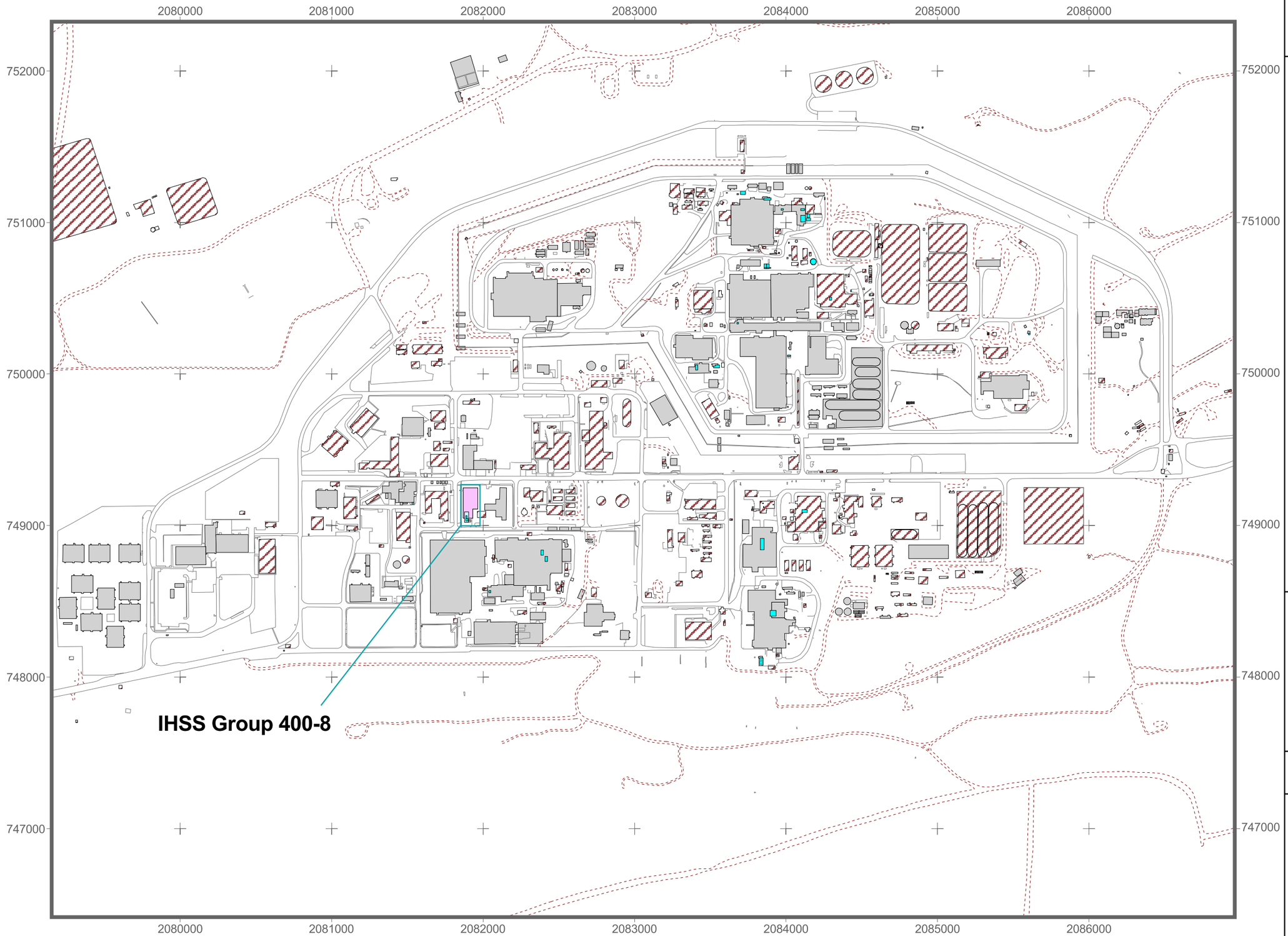
Accelerated action activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) (DOE 2001), IASAP Addendum #IA-03-01 (DOE 2002a), and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003a). Notification of the planned activities was provided in ER RSOP Notification #03-06 (DOE 2003b), approved by the Colorado Department of Public Health and Environment (CDPHE) on March 11, 2003 (CDPHE 2003).

This report contains the information necessary to demonstrate attainment of cleanup objectives and final closure of IHSS Group 400-8, including:

- Site characterization information
  - Description of site characterization activities, and
  - Site characterization data, including data tables and maps;
- Site accelerated action information
  - Description of the accelerated action, including the rationale for the action,
  - Map of the project area (Figure 2) and dates and durations of specific remedial activities, and
  - Photographs documenting site characterization, remediation, and reclamation activities;
- Confirmation sampling data, including data tables and location maps, as well as a comparison of the confirmation data to applicable cleanup goals;
- Description of deviations from the ER RSOP (DOE 2003a);

FIGURE 1

IHSS Group 400-8 Location



KEY

- IHSS 400-122
- UBC 441
- Tank
- Building - standing
- Building - demolished
- Paved road
- Dirt Road

N
W E
S

300 0 300 600 900 Feet

Scale = 1:7500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

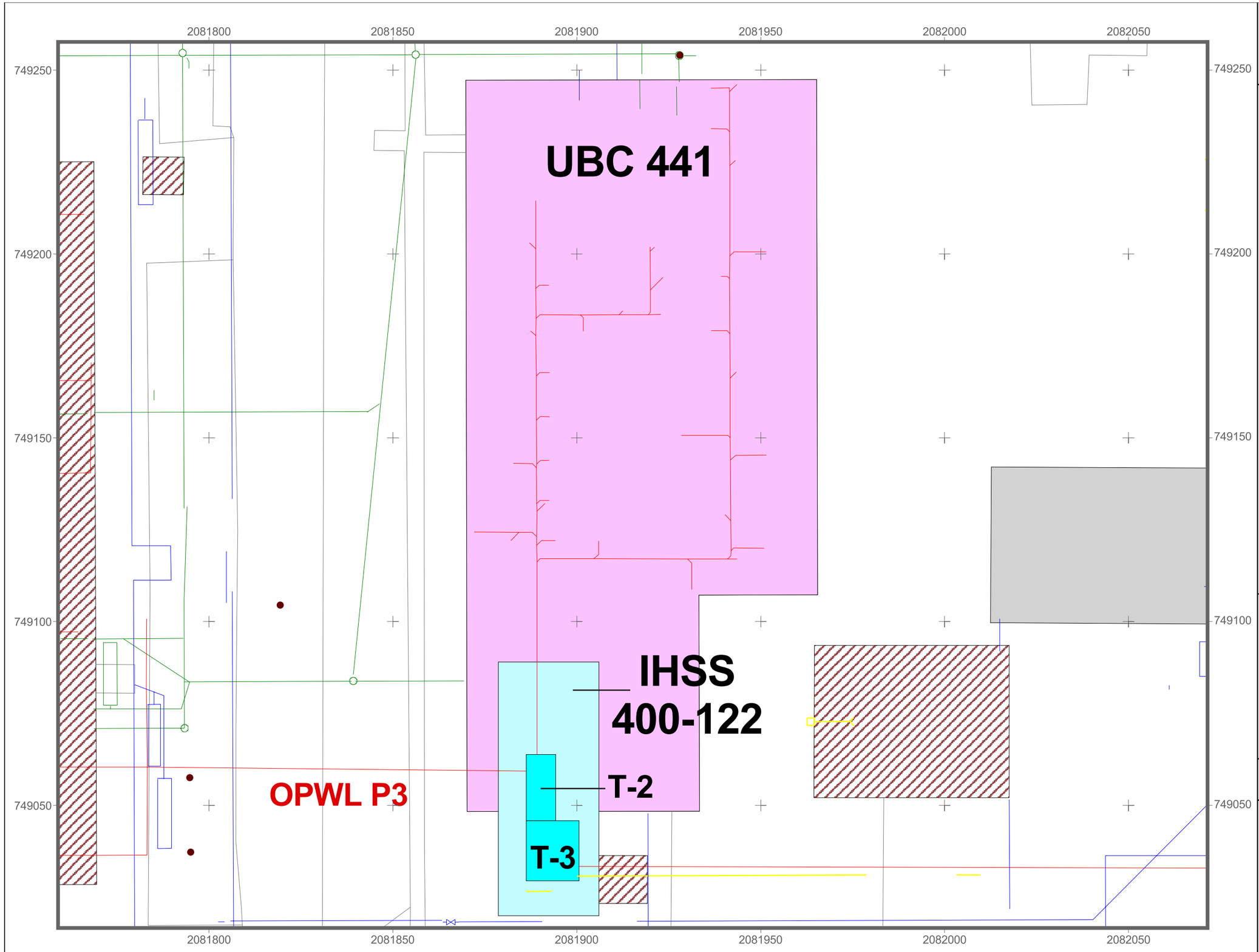
Prepared by: RADMS

Date: 03/22/04

File: W/Projects/Fy2003/400-8
/Closeout Report/400-8_closeout.apr

FIGURE 2

IHSS Group 400-8
UBC Site and IHSSs



KEY

- IHSS 400-122
- UBC 441
- Tank
- Building - standing
- Building - demolished
- Manhole
- Paved road
- Original Process Waste Line (OPWL)
- Water main
- Sewer
- Storm drain

N
W E
S

10 0 10 20 30 40 Feet

Scale = 1:300

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS

Date: 03/22/04

File: W/Projects/Fy2003/400-8
/Closeout Report/400-8_closeout.apr

- Description of the Subsurface Soil Risk Screen (SSRS);
- Description of near-term stewardship actions and long-term stewardship recommendations;
- Disposition of wastes;
- Site reclamation;
- Table of No Longer Representative (NLR) locations and sample numbers that have been remediated. These data will be used to mark database records so they are not used in the Comprehensive Risk Assessment (CRA) or other Site analyses; and
- Data Quality Assessment (DQA), including comparisons of confirmation data with project data quality objectives (DQOs).

Approval of this Closeout Report constitutes regulatory agency concurrence that this IHSS Group is a No Further Accelerated Action (NFAA) site. This information and NFAA determination will be documented in the Fiscal Year (FY) 04 Historical Release Report (HRR).

2.0 SITE CHARACTERIZATION

IHSS Group 400-8 characterization information consists of historical knowledge and analytical data. Historical information for the IHSS Group was derived from previous studies (DOE 1992-2003, 1996, 2000a, 2001) and is summarized in Sections 2.1 and 2.2. Analytical data for IHSS Group 400-8, existing characterization and accelerated action data are summarized in Sections 2.3 and 2.4. Confirmation samples are discussed in Section 4.0. A compact disc that contains the accelerated action and confirmation data sets, including quality assurance (QA) and quality control (QC) data, is enclosed.

Accelerated action analytical data were collected in accordance with IASAP Addendum #IA-03-01 (DOE 2002a). Sampling specifications, including potential contaminants of concern (PCOCs) and media sampled, are presented in Table 1. Deviations from the IASAP Addendum and confirmation samples are also presented and explained in Table 1. An actual sampling and analysis summary, including confirmation sampling, is presented in Table 2.

2.1 UBC 441, Office Building

Building 441 was located in the northwestern portion of the 400 Area and was placed into service in 1952. The building footprint was approximately 17,075 square feet (ft^2). The building was originally used as a laboratory, and was converted into an office building in 1966. PCOCs for UBC 441 are based on process knowledge and include radionuclides, metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and nitrates. No preaccelerated action characterization has been performed of the soil underlying the building (DOE 1992-2003).

Table 1
IHSS Group 400-8 Accelerated Action Characterization Specifications and Deviations

IHSS /PAC /UBC Site	Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Actual Media	Actual Depth Interval (ft)	Actual Analytes	Comments/Deviations
IHSS 400-122	BV38-002	2081890.494	749050.500	2081890.490	749050.500	Subsurface soil	10.0-11.0	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted underground tank, location not moved significantly, 5.5 ft deeper to get below Tank T-2, radionuclides and PCBs accidently omitted from SAP Addendum added.
IHSS 400-122	BV38-003	2081890.494	749036.698	2081887.616	749036.635	Subsurface soil	12.5-17.0	Metals, Nitrate, VOCs, SVOCs	Biased, targeted underground tank, location moved 3 ft to get beneath tank, 8 ft deeper to get below Tank T-3.
IHSS 400-122	BV38-004	2081897.970	749038.423	2081895.612	749034.349	Subsurface soil	12.5-15.5	Metals, Nitrate, VOCs, SVOCs	Biased, targeted under-ground tank, location moved 5 ft to get beneath tank, 8 ft deeper to get below Tank T-3.
UBC 441	BV38-005	2081932.199	749108.941	2081920.712	749115.398	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 13 ft to sample actual OPWL, no depth change.
UBC 441	BV38-005	2081932.199	749108.941	2081920.712	749115.398	Subsurface soil	5.0-5.0	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 13 ft to sample actual OPWL, 0.5 ft deeper to sample actual OPWL.
UBC 441	BV38-006	2081890.668	749114.084	2081889.571	749116.481	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 3 ft to sample actual OPWL, no depth change.
UBC 441	BV38-006	2081890.668	749114.084	2081889.571	749116.481	Subsurface soil	4.5-6.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 3 ft to sample actual OPWL, 2 ft deeper to sample actual OPWL.
IHSS 000-121	BV38-007	2081868.089	749059.511	2081868.115	749059.504	Surface soil	0.0-0.5	Metals, Nitrate, VOCs, SVOCs	Biased, targeted OPWL, location not moved significantly, no depth change.
IHSS 000-121	BV38-007	2081868.089	749059.511	2081868.115	749059.504	Subsurface soil	3.5-4.5	Metals, Nitrate, VOCs, SVOCs	Biased, targeted OPWL, location not moved significantly, 1 ft deeper to sample actual OPWL.
UBC 441	BV38-008			2081888.626	749104.659	Subsurface soil	4.5-6.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Added, biased, targeted UBC and OPWL.

IHSS /PAC /UBC Site	Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Actual Media	Actual Depth Interval (ft)	Actual Analytes	Comments/Deviations
IHSS 000-121	BV38-009			2081794.571	749066.169	Subsurface soil	9.5-10.5	Radionuclides, Metals, VOCs	Added, biased, targeted OPWL, depth interval adjusted to sample stain beneath OPWL associated with manhole.
IHSS 000-121	BV38-010			2081799.667	749057.609	Subsurface soil	5.0-5.5	Radionuclides, Metals, VOCs	Added, biased, targeted manhole, depth interval adjusted to sample beneath OPWL associated with manhole.
IHSS 000-121	BV38-010			2081799.667	749057.609	Subsurface soil	5.0-8.0	Radionuclides, Metals, VOCs	Added, biased, targeted manhole, depth interval adjusted to sample beneath OPWL associated with manhole.
IHSS 000-121	BV38-011			2081789.483	749038.061	Subsurface soil	6.5-8.5	Radionuclides, Metals, VOCs	Added, biased, targeted manhole, depth interval adjusted to sample beneath OPWL associated with manhole.
IHSS 000-121	BV38-012			2081898.225	749023.566	Subsurface soil	2.0-2.5	Radionuclides, Metals, VOCs, SVOCs	Confirmation sample (added), biased, targeted soil removal area, depth interval adjusted to see if surface lead contamination (removed) extended to subsurface.
IHSS 000-121	BV38-012			2081898.225	749023.566	Subsurface soil	2.5-4.5	Radionuclides, Metals, VOCs, SVOCs	Confirmation sample (added), biased, targeted soil removal area, depth interval adjusted to see if surface lead contamination (removed) extended to subsurface.
IHSS 000-121	BV38-013			2081896.137	749023.311	Subsurface soil	2.0-2.5	Radionuclides, Metals, VOCs, SVOCs	Confirmation sample (added), biased, targeted soil removal area, depth interval adjusted to see if surface lead contamination (removed) extended to subsurface.
IHSS 000-121	BV38-013			2081896.137	749023.311	Subsurface soil	2.5-4.5	Radionuclides, Metals, VOCs, SVOCs	Confirmation sample (added), biased, targeted soil removal area, depth interval adjusted to see if surface lead contamination (removed) extended to subsurface.
UBC 441	BV39-002	2081889.344	749182.762			Surface soil	0.0-0.5	Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, interval not sampled because surface soil removed.

IHSS /PAC /UBC Site	Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Actual Media	Actual Depth Interval (ft)	Actual Analytes	Comments/Deviations
UBC 441	BV39-002	2081889.344	749182.762	2081888.922	749185.072	Subsurface soil	2.0-2.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 2.5 ft to sample OPWL, 0.5 ft shallower to sample actual OPWL. Error in SAP Addendum assigned radionuclide and PCB samples to this location, should have been BV38-002, radionuclide sample collected here but no PCB sample.
UBC 441	BV39-003-01	2081890.650	749221.060	2081888.650	749213.804	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 9 ft to sample OPWL, no depth change, radionuclides added.
UBC 441	BV39-003-01	2081890.650	749221.060	2081888.650	749213.804	Subsurface soil	2.0-2.3	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 9 ft to sample OPWL, 0.5 ft shallower to sample OPWL, radionuclides added.
UBC 441	BV39-004	2081922.153	749182.287	2081919.847	749183.925	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 3 ft to sample OPWL, no depth change, radionuclides added.
UBC 441	BV39-004	2081922.153	749182.287	2081919.847	749183.925	Subsurface soil	2.0-2.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 3 ft to sample OPWL, 0.5 ft shallower to sample OPWL, radionuclides added.
UBC 441	BV39-006			2081923.751	749166.755	Subsurface soil	2.5-4.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Added, biased, position and depth adjusted to sample beneath northern UBC slab.
UBC 441	BV39-006			2081923.751	749166.755	Subsurface soil	4.5-6.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Added, biased, position and depth adjusted to sample beneath northern UBC slab.
UBC 441	BV39-007			2081889.329	749142.084	Subsurface soil	6.2-6.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Added, biased, targeted UBC and OPWL, depth adjusted to sample beneath actual OPWL.
IHSS 000-121	BW38-001	2081949.725	749032.098	2081949.926	749033.560	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, began sampling at surface, interval added.

IHSS /PAC /UBC Site	Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Actual Media	Actual Depth Interval (ft)	Actual Analytes	Comments/Deviations
IHSS 000-121	BW38-001	2081949.725	749032.098	2081949.926	749033.560	Subsurface soil	0.5-2.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, depth continued from above, interval added.
IHSS 000-121	BW38-001	2081949.725	749032.098	2081949.926	749033.560	Subsurface soil	2.5-4.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, depth continued from above, interval in SAP Addendum.
IHSS 000-121	BW38-001	2081949.725	749032.098	2081949.926	749033.560	Subsurface soil	4.5-6.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, depth continued from above, interval added.
IHSS 000-121	BW38-001	2081949.725	749032.098	2081949.926	749033.560	Subsurface soil	6.5-8.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, depth continued from above, interval added.
IHSS 000-121	BW38-002	2081984.228	749031.523	2081984.363	749032.942	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, sampling began at surface, interval added.
IHSS 000-121	BW38-002	2081984.228	749031.523	2081984.363	749032.942	Subsurface soil	0.5-2.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, depth continued from above, interval added.
IHSS 000-121	BW38-002	2081984.228	749031.523	2081984.363	749032.942	Subsurface soil	2.5-4.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, depth continued from above, interval in original proposal.
IHSS 000-121	BW38-002	2081984.228	749031.523	2081984.363	749032.942	Subsurface soil	4.5-6.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, depth continued from above, interval added.
IHSS 000-121	BW38-002	2081984.228	749031.523	2081984.363	749032.942	Subsurface soil	6.5-8.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, targeted OPWL, location moved 3 ft to sample actual OPWL, depth continued from above, interval added.
UBC 441	BW38-003	2081948.752	749114.076	2081939.807	749116.156	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 10 ft to sample actual OPWL, depth not changed.

IHSS /PAC /UBC Site	Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Actual Media	Actual Depth Interval (ft)	Actual Analytes	Comments/Deviations
UBC 441	BW38-003	2081948.752	749114.076	2081939.807	749116.156	Subsurface soil	4.0-4.0	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, location moved 10 ft to sample actual OPWL, depth adjusted to sample below OPWL.
IHSS 000-121	BW38-004			2082028.600	749033.521	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, added to sample OPWL, sampling began at surface.
IHSS 000-121	BW38-004			2082028.600	749033.521	Subsurface soil	0.5-2.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, added to sample OPWL, depth continued from above.
IHSS 000-121	BW38-004			2082028.600	749033.521	Subsurface soil	2.5-4.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, added to sample OPWL, depth continued from above.
IHSS 000-121	BW38-004			2082028.600	749033.521	Subsurface soil	4.5-6.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, added to sample OPWL, depth continued from above.
IHSS 000-121	BW38-004			2082028.600	749033.521	Subsurface soil	6.5-8.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs, PCBs	Biased, added to sample OPWL, depth continued from above.
UBC 441	BW39-000	2081948.377	749244.681	2081942.057	749230.471	Subsurface soil	1.0-1.0	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, moved 15 ft to sample actual OPWL, 0-1 ft interval removed along with OPWL, sample collected from beneath former OPWL in undisturbed soil at 1 ft.
UBC 441	BW39-000	2081948.377	749244.681	2081942.057	749230.471	Subsurface soil	4.5-6.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, moved 15 ft to sample actual OPWL, depth not changed.
UBC 441	BW39-001	2081948.386	749199.514	2081941.424	749196.289	Surface soil	0.0-0.5	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, moved 8 ft to sample actual OPWL, depth not changed.

IHSS /PAC /UBC Site	Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Actual Media	Actual Depth Interval (ft)	Actual Analytes	Comments/Deviations
UBC 441	BW39-001	2081948.386	749199.514	2081941.424	749196.289	Subsurface soil	2.0-2.0	Radionuclides, Metals, Nitrate, VOCs, SVOCs	Biased, targeted UBC and OPWL, moved 8 ft to sample actual OPWL, depth not changed.

Table 2
IHSS Group 400-8 Sampling and Analysis Summary

Category*	SAP Addendum	Actual
Number of Sampling Locations	14	23
Number of Samples	22	47
Number of Radionuclide Analyses	12	43
Number of Metal Analyses	23	47
Number of VOC Analyses	23	47
Number of SVOC Analyses	23	43
Number of Nitrate Analyses	23	39
Number of PCB Analyses	3	16

*Uncollected surface soil analyses (soil removed) at location BV39-002 not included in Actual column.

2.2 IHSSs 400-122 and Portions of 000-121, OPWL Tanks T-2 and T-3, Underground Concrete Waste Storage Tanks

IHSS 400-122 partially underlies Building 441 and extends south of the building encompassing Tanks T-2 and T-3. Tanks T-2 and T-3 were two interconnected underground tanks south of Building 441. Both tanks were constructed of reinforced concrete and had a combined capacity of approximately 12,000 gallons (DOE 1996). The tanks were part of the OPWL system and were used to handle waste from Building 123, Building 441, and possibly Buildings 122 and 444. Tanks T-2 and T-3 were installed in 1952 and abandoned in June 1982 after reportedly being decontaminated, filled with gravel, and covered with concrete (DOE 2001). Interviewees for the Comprehensive Environmental Assessment and Response Program (CEARP) Phase I document mentioned that leaks might have occurred (DOE 1992-2003). At times, the tanks were known to fill with groundwater, which was pumped out and sent to waste treatment (DOE 2001). Groundwater infiltration was confirmed during tank stabilization (DOE 1996).

The tanks were originally installed 60 feet south of Building 441. In 1966, the Building 441 addition was constructed over approximately 7.5 feet of the northern part of the tank system (DOE 2001). At this time, a footing wall was laid over Tank T-2 to accommodate construction.

The tank system consisted of two tanks (DOE 1996). The northern tank, Tank T-2 (3,000 gallons), consisted of two chambers: a wet well for settling and a chamber containing a limestone bed for pH control. The limestone bed may be the source of references to the tanks being filled with gravel. Tank T-2 was wholly or partially beneath Building 441. Tank T-3 (9,000 gallons) was an underground holding tank with a cover consisting of three enclosed chambers that gave access to a control valve, the tank itself, and transfer pumps. Chamber access from the surface was through steel cover-plates. Tank T-3 was located underground directly outside the Building 441 footprint. Flow was from the (Tank T-2) wet well to the limestone bed and then to the (Tank T-3) holding tank. Because of the conversion of Building 441 to an office, waste was no longer generated from this source. However, the tanks may have received waste from Building 123 as late as June 1966.

Nitrates, radionuclides, and metals were assumed to be present in process waste from Buildings 441 and 123 (DOE 1992-2003). One reference describes the waste as having total dissolved solids (TDS) ranging from 532 to 965 parts per million (ppm) and a pH that ranged from 7.15 to

5.85 (DOE 2001). Another source says waste streams included acids, bases, solvents, radionuclides, metals, thiocyanate, ethylene glycol, trace PCBs, bleach, soap, blood, and hydrogen peroxide. Tank T-3 reportedly last stored ammonia after storing several other wastes. This site has been identified as a known release location (DOE 1992-2003).

Documentation was found for only one release from these tanks (DOE 2001). On June 1, 1953, approximately 1,200 gallons overflowed from the tanks. The spill consisted of process waste from Building 123. In 1953, the system was modified to allow liquid wastes to be released directly to the sanitary system, therefore reducing the amount of waste passing through these tanks.

No gravel was present in or around the tanks during their final removal in November and December 2003. Both tanks had concrete covers. Tank T-3 had been previously pumped, cleaned of sludge, rinsed, and filled with polyurethane foam (DOE 1996).

Surface and subsurface soil samples collected in 1995 adjacent to Tanks T-2 and T-3 indicated that americium-241, plutonium-239/240, metals, VOCs, SVOCs, pesticides, and PCBs were present at concentrations greater than background means plus two standard deviations. Soil data are available in the IA Data Summary Report (DOE 2000a).

Samples of the liquid in the Tank T-2 vault indicated that every radionuclide analyzed for had positive activity, with gross alpha/beta, uranium-233/234, uranium-235, and uranium-238 having moderate to high activities (DOE 2001).

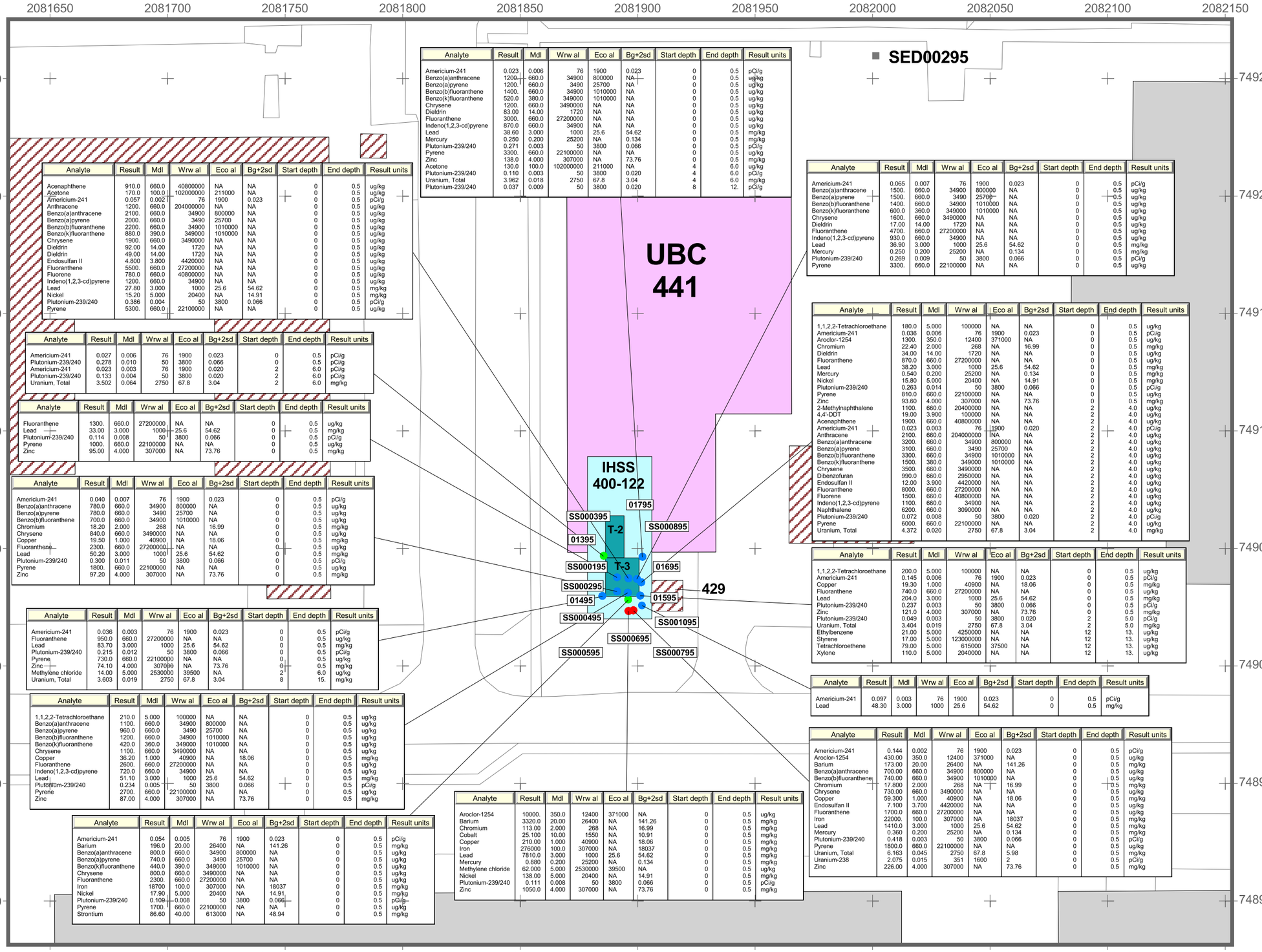
2.3 Existing Characterization Data

Existing characterization data greater than background means plus two standard deviations or method detection limits (MDLs) are presented on Figure 3. Analytical results from 15 sampling locations indicate that surface soil lead concentrations exceeded the RFCA wildlife refuge worker (WRW) action levels (ALs) at two locations approximately 8 feet south of Tanks T-2 and T-3. The concentration at sampling location SS000695 was 7,810 milligrams per kilogram (mg/kg), and the concentration at sampling location SS000795 was 1,410 mg/kg. The WRW AL for lead is 1,000 mg/kg. These lead detections also exceeded the ecological receptor AL, which is 25.6 mg/kg. Lead concentrations at 10 other locations exceeded the ecological receptor AL. Concentrations at these locations ranged from 27.8 to 204 mg/kg.

2.4 Accelerated Action Characterization Data

Accelerated action soil sampling locations and analytical results for IHSS Group 400-8 are presented on Figures 4 and 5 and in Table 3. Only results greater than background means plus two standard deviations or reporting limits (RLs) are shown. IHSS Group 400-8 data indicate that all contaminant concentrations are less than RFCA WRW ALs, except for two subsurface soil locations. The arsenic concentration at location BV38-004 (between 4.5 and 6.5 feet in depth) was 23 mg/kg, and the WRW AL is 22.2 mg/kg. The arsenic concentration was also greater than the ecological receptor AL of 21.6 mg/kg. The benzo(a)pyrene concentration at location BV38-002 (between 10 and 11 feet in depth) was 3,700 micrograms per kilogram (μg/kg), and the WRW AL is 3,490 μg/kg.

FIGURE 3
IHSS Group 400-8
Existing Characterization Data Greater Than Background Means Plus Two Standard Deviations or Method Detection Limits



Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Americium-241	0.023	0.006	76	1900	0.023	0	0.5	pCi/g
Benzo(a)anthracene	1200.	660.0	34900	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	1200.	660.0	3490	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	1400.	660.0	34900	1010000	NA	0	0.5	ug/kg
Benzo(k)fluoranthene	520.0	380.0	349000	1010000	NA	0	0.5	ug/kg
Chrysene	1200.	660.0	3490000	NA	NA	0	0.5	ug/kg
Dieldrin	83.00	14.00	1720	NA	NA	0	0.5	ug/kg
Fluoranthene	3000.	660.0	27200000	NA	NA	0	0.5	ug/kg
Indeno(1,2,3-cd)pyrene	870.0	660.0	34900	NA	NA	0	0.5	ug/kg
Lead	38.60	3.000	1000	25.6	54.62	0	0.5	mg/kg
Mercury	0.250	0.200	25200	NA	0.134	0	0.5	mg/kg
Plutonium-239/240	0.271	0.003	50	3800	0.066	0	0.5	pCi/g
Pyrene	3300.	660.0	22100000	NA	NA	0	0.5	ug/kg
Zinc	138.0	4.000	307000	NA	73.76	0	0.5	mg/kg
Acetone	130.0	100.0	102000000	211000	NA	4	6.0	ug/kg
Plutonium-239/240	0.110	0.003	50	3800	0.020	4	6.0	pCi/g
Uranium, Total	3.962	0.018	2750	67.8	3.04	4	6.0	mg/kg
Plutonium-239/240	0.037	0.009	50	3800	0.020	8	12.	pCi/g

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Acenaphthene	910.0	660.0	40800000	NA	NA	0	0.5	ug/kg
Acetone	170.0	100.0	102000000	211000	NA	0	0.5	ug/kg
Americium-241	0.057	0.002	76	1900	0.023	0	0.5	pCi/g
Anthracene	1200.	660.0	204000000	NA	NA	0	0.5	ug/kg
Benzo(a)anthracene	2100.	660.0	34900	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	2000.	660.0	3490	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	2200.	660.0	34900	1010000	NA	0	0.5	ug/kg
Benzo(k)fluoranthene	880.0	390.0	349000	1010000	NA	0	0.5	ug/kg
Chrysene	1900.	660.0	3490000	NA	NA	0	0.5	ug/kg
Dieldrin	92.00	14.00	1720	NA	NA	0	0.5	ug/kg
Dieldrin	49.00	14.00	1720	NA	NA	0	0.5	ug/kg
Endosulfan II	4.800	3.800	4420000	NA	NA	0	0.5	ug/kg
Fluoranthene	5500.	660.0	27200000	NA	NA	0	0.5	ug/kg
Fluorene	780.0	660.0	40800000	NA	NA	0	0.5	ug/kg
Indeno(1,2,3-cd)pyrene	1200.	660.0	34900	NA	NA	0	0.5	ug/kg
Lead	27.80	3.000	1000	25.6	54.62	0	0.5	mg/kg
Nickel	15.20	5.000	20400	NA	14.91	0	0.5	mg/kg
Plutonium-239/240	0.386	0.004	50	3800	0.066	0	0.5	pCi/g
Pyrene	5300.	660.0	22100000	NA	NA	0	0.5	ug/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Americium-241	0.027	0.006	76	1900	0.023	0	0.5	pCi/g
Plutonium-239/240	0.278	0.010	50	3800	0.066	0	0.5	pCi/g
Americium-241	0.023	0.003	76	1900	0.020	2	6.0	pCi/g
Plutonium-239/240	0.133	0.004	50	3800	0.020	2	6.0	pCi/g
Uranium, Total	3.502	0.064	2750	67.8	3.04	2	6.0	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Fluoranthene	1300.	660.0	27200000	NA	NA	0	0.5	ug/kg
Lead	33.00	3.000	1000	25.6	54.62	0	0.5	mg/kg
Plutonium-239/240	0.114	0.008	50	3800	0.066	0	0.5	pCi/g
Pyrene	1000.	660.0	22100000	NA	NA	0	0.5	ug/kg
Zinc	95.00	4.000	307000	NA	73.76	0	0.5	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Americium-241	0.040	0.007	76	1900	0.023	0	0.5	pCi/g
Benzo(a)anthracene	780.0	660.0	34900	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	780.0	660.0	3490	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	700.0	660.0	34900	1010000	NA	0	0.5	ug/kg
Chromium	18.20	2.000	268	NA	16.99	0	0.5	mg/kg
Chrysene	840.0	660.0	3490000	NA	NA	0	0.5	ug/kg
Copper	19.50	1.000	40900	NA	18.06	0	0.5	mg/kg
Fluoranthene	2300.	660.0	27200000	NA	NA	0	0.5	ug/kg
Lead	50.20	3.000	1000	25.6	54.62	0	0.5	mg/kg
Plutonium-239/240	0.300	0.011	50	3800	0.066	0	0.5	pCi/g
Pyrene	1800.	660.0	22100000	NA	NA	0	0.5	ug/kg
Zinc	97.20	4.000	307000	NA	73.76	0	0.5	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Americium-241	0.036	0.003	76	1900	0.023	0	0.5	pCi/g
Fluoranthene	950.0	660.0	27200000	NA	NA	0	0.5	ug/kg
Lead	83.70	3.000	1000	25.6	54.62	0	0.5	mg/kg
Plutonium-239/240	0.215	0.012	50	3800	0.066	0	0.5	pCi/g
Pyrene	730.0	660.0	22100000	NA	NA	0	0.5	ug/kg
Zinc	74.10	4.000	307000	NA	73.76	0	0.5	mg/kg
Methylene chloride	14.00	5.000	2530000	39500	NA	2	6.0	ug/kg
Uranium, Total	3.603	0.019	2750	67.8	3.04	8	15.	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
1,1,2,2-Tetrachloroethane	210.0	5.000	100000	NA	NA	0	0.5	ug/kg
Benzo(a)anthracene	1100.	660.0	34900	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	960.0	660.0	3490	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	1200.	660.0	34900	1010000	NA	0	0.5	ug/kg
Benzo(k)fluoranthene	420.0	360.0	349000	1010000	NA	0	0.5	ug/kg
Chrysene	1100.	660.0	3490000	NA	NA	0	0.5	ug/kg
Copper	36.20	1.000	40900	NA	18.06	0	0.5	mg/kg
Fluoranthene	2600.	660.0	27200000	NA	NA	0	0.5	ug/kg
Indeno(1,2,3-cd)pyrene	720.0	660.0	34900	NA	NA	0	0.5	ug/kg
Lead	51.10	3.000	1000	25.6	54.62	0	0.5	mg/kg
Plutonium-239/240	0.234	0.005	50	3800	0.066	0	0.5	pCi/g
Pyrene	2700.	660.0	22100000	NA	NA	0	0.5	ug/kg
Zinc	87.00	4.000	307000	NA	73.76	0	0.5	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Americium-241	0.054	0.005	76	1900	0.023	0	0.5	pCi/g
Barium	196.0	20.00	26400	NA	141.26	0	0.5	mg/kg
Benzo(a)anthracene	800.0	660.0	34900	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	740.0	660.0	3490	25700	NA	0	0.5	ug/kg
Benzo(k)fluoranthene	440.0	390.0	349000	1010000	NA	0	0.5	ug/kg
Chrysene	800.0	660.0	3490000	NA	NA	0	0.5	ug/kg
Fluoranthene	2300.	660.0	27200000	NA	NA	0	0.5	ug/kg
Iron	18700	100.0	307000	NA	18037	0	0.5	mg/kg
Nickel	17.90	5.000	20400	NA	14.91	0	0.5	mg/kg
Plutonium-239/240	0.109	0.008	50	3800	0.066	0	0.5	pCi/g
Pyrene	1700.	660.0	22100000	NA	NA	0	0.5	ug/kg
Strontium	86.60	40.00	613000	NA	48.94	0	0.5	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Aroclor-1254	10000.	350.0	12400	371000	NA	0	0.5	ug/kg
Barium	3320.0	20.00	26400	NA	141.26	0	0.5	mg/kg
Chromium	113.00	2.000	268	NA	16.99	0	0.5	mg/kg
Cobalt	25.100	10.00	1550	NA	10.91	0	0.5	mg/kg
Copper	210.00	1.000	40900	NA	18.06	0	0.5	mg/kg
Iron	276000	100.0	307000	NA	18037	0	0.5	mg/kg
Lead	7810.0	3.000	1000	25.6	54.62	0	0.5	mg/kg
Mercury	0.880	0.200	25200	NA	0.134	0	0.5	mg/kg
Methylene chloride	62.000	5.000	2530000	39500	NA	0	0.5	ug/kg
Nickel	138.00	5.000	20400	NA	14.91	0	0.5	mg/kg
Plutonium-239/240	0.111	0.008	50	3800	0.066	0	0.5	pCi/g
Zinc	1050.0	4.000	307000	NA	73.76	0	0.5	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Americium-241	0.065	0.007	76	1900	0.023	0	0.5	pCi/g
Benzo(a)anthracene	1500.	660.0	34900	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	1500.	660.0	3490	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	1400.	660.0	34900	1010000	NA	0	0.5	ug/kg
Benzo(k)fluoranthene	600.0	360.0	349000	1010000	NA	0	0.5	ug/kg
Chrysene	1600.	660.0	3490000	NA	NA	0	0.5	ug/kg
Dieldrin	17.00	14.00	1720	NA	NA	0	0.5	ug/kg
Fluoranthene	4700.	660.0	27200000	NA	NA	0	0.5	ug/kg
Indeno(1,2,3-cd)pyrene	930.0	660.0	34900	NA	NA	0	0.5	ug/kg
Lead	36.90	3.000	1000	25.6	54.62	0	0.5	mg/kg
Mercury	0.250	0.200	25200	NA	0.134	0	0.5	mg/kg
Plutonium-239/240	0.269	0.009	50	3800	0.066	0	0.5	pCi/g
Pyrene	3300.	660.0	22100000	NA	NA	0	0.5	ug/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
1,1,2,2-Tetrachloroethane	180.0	5.000	100000	NA	NA	0	0.5	ug/kg
Americium-241	0.036	0.006	76	1900	0.023	0	0.5	pCi/g
Aroclor-1254	1300.	350.0	12400	371000	NA	0	0.5	ug/kg
Chromium	22.40	2.000	268	NA	16.99	0	0.5	mg/kg
Dieldrin	34.00	14.00	1720	NA	NA	0	0.5	ug/kg
Fluoranthene	870.0	660.0	27200000	NA	NA	0	0.5	ug/kg
Lead	38.20	3.000	1000	25.6	54.62	0	0.5	mg/kg
Mercury	0.540	0.200	25200	NA	0.134	0	0.5	mg/kg
Nickel	15.80	5.000	20400	NA	14.91	0	0.5	mg/kg
Plutonium-239/240	0.263	0.014	50	3800	0.066	0	0.5	pCi/g
Pyrene	810.0	660.0	22100000	NA	NA	0	0.5	ug/kg
Zinc	93.60	4.000	307000	NA	73.76	0	0.5	mg/kg
2-Methylnaphthalene	1100.	660.0	20400000	NA	NA	2	4.0	ug/kg
4,4'-DDT	19.00	3.900	100000	NA	NA	2	4.0	ug/kg
Acenaphthene	1900.	660.0	40800000	NA	NA	2	4.0	ug/kg
Americium-241	0.023	0.003	76	1900	0.020	2	4.0	pCi/g
Anthracene	2100.	660.0	204000000	NA	NA	2	4.0	ug/kg
Benzo(a)anthracene	3200.	660.0	34900	800000	NA	2	4.0	ug/kg
Benzo(a)pyrene	3100.	660.0	3490	25700	NA	2	4.0	ug/kg
Benzo(b)fluoranthene	3300.	660.0	34900	1010000	NA	2	4.0	ug/kg
Benzo(k)fluoranthene	1500.	380.0	349000	1010000	NA	2	4.0	ug/kg
Chrysene	3500.	660.0	3490000	NA	NA	2	4.0	ug/kg
Dibenzofuran	990.0	660.0	2950000	NA	NA	2	4.0	ug/kg
Endosulfan II	12.00	3.900	4420000	NA	NA	2	4.0	ug/kg
Fluoranthene	8000.	660.0	27200000	NA	NA	2	4.0	ug/kg
Fluorene	1500.	660.0	40800000	NA	NA	2	4.0	ug/kg
Indeno(1,2,3-cd)pyrene	1100.	660.0	34900	NA	NA	2	4.0	ug/kg
Naphthalene	6200.	660.0	3090000	NA	NA	2	4.0	ug/kg
Plutonium-239/240	0.072	0.008	50	3800	0.020	2	4.0	pCi/g
Pyrene	6000.	660.0	22100000	NA	NA	2	4.0	ug/kg
Uranium, Total	4.372	0.020	2750	67.8	3.04	2	4.0	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
1,1,2,2-Tetrachloroethane	200.0	5.000	100000	NA	NA	0	0.5	ug/kg
Americium-241	0.145	0.006	76	1900	0.023	0	0.5	pCi/g
Copper	19.30	1.000	40900	NA	18.06	0	0.5	mg/kg
Fluoranthene	740.0	660.0	27200000	NA	NA	0	0.5	ug/kg
Lead	204.0	3.000	1000	25.6	54.62	0	0.5	mg/kg
Plutonium-239/240	0.237	0.003	50	3800	0.066	0	0.5	pCi/g
Zinc	121.0	4.000	307000	NA	73.76	0	0.5	mg/kg
Plutonium-239/240	0.049	0.003	50	3800	0.020	2	5.0	pCi/g
Uranium, Total	3.404	0.019	2750	67.8	3.04	2	5.0	mg/kg
Ethylbenzene	21.00	5.000	4250000	NA	NA	12	13.	ug/kg
Styrene	17.00	5.000	123000000	NA	NA	12	13.	ug/kg
Tetrachloroethene	79.00	5.000	615000	37500	NA	12	13.	ug/kg
Xylene	110.0	5.000	2040000	NA	NA	12	13.	ug/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Americium-241	0.097	0.003	76	1900	0.023	0	0.5	pCi/g
Lead	48.30	3.000	1000	25.6	54.62	0	0.5	mg/kg

Analyte	Result	Mdl	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Result units
Americium-241	0.144	0.002	76	1900	0.023	0	0.5	pCi/g
Aroclor-1254	430.00	350.0	12400	371000	NA	0	0.5	ug/kg
Barium	173.00	20.00	26400	NA	141.26	0	0.5	mg/kg
Benzo(a)anthracene	700.00	660.0	34900	800000	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	740.00	660.0	34900	1010000	NA	0	0.5	ug/kg
Chromium	17.800	2.000	268	NA	16.99	0	0.5	mg/kg
Chrysene	730.00	660.0	3490000	NA	NA	0	0.5	ug/kg
Copper	59.300	1.000	40900	NA	18.06	0	0.5	mg/kg
Endosulfan II	7.100	3.700	4420000	NA	NA	0	0.5	ug/kg
Fluoranthene	1700.0	660.0	27200000	NA	NA	0	0.5	ug/kg
Iron	22000.	100.0	307000	NA	18037	0	0.5	mg/kg
Lead	1410.0	3.000	1000	25.6	54.62	0	0.5	mg/kg
Mercury	0.360	0.200	25200	NA	0.134	0	0.5	mg/kg
Plutonium-239/240	0.418	0.003	50	3800	0.066	0	0.5	pCi/g
Pyrene	1800.0	660.0	22100000	NA	NA	0	0.5	ug/kg
Uranium, Total	6.163	0.045	2750	67.8	5.98	0	0.5	mg/kg
Uranium-238	2.075	0.015	351	1600	2	0	0.5	pCi/g
Zinc	226.00	4.000	307000	NA	73.76	0	0.5	mg/kg

KEY

- Greater than Wildlife Refuge Worker Action Level
- Greater than Ecological Receptor Action Level
- Greater than Background Means + 2 Standard Deviations or Method Detection Limits and less than Action Levels
- Less than Background Means + 2 Standard Deviations or Method Detection Limits
- IHSS 400-122
- UBC 441
- Tanks
- Building - standing
- Building - demolished
- Paved road

N
W E
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20 0 20 40 60 Feet

Scale = 1:500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

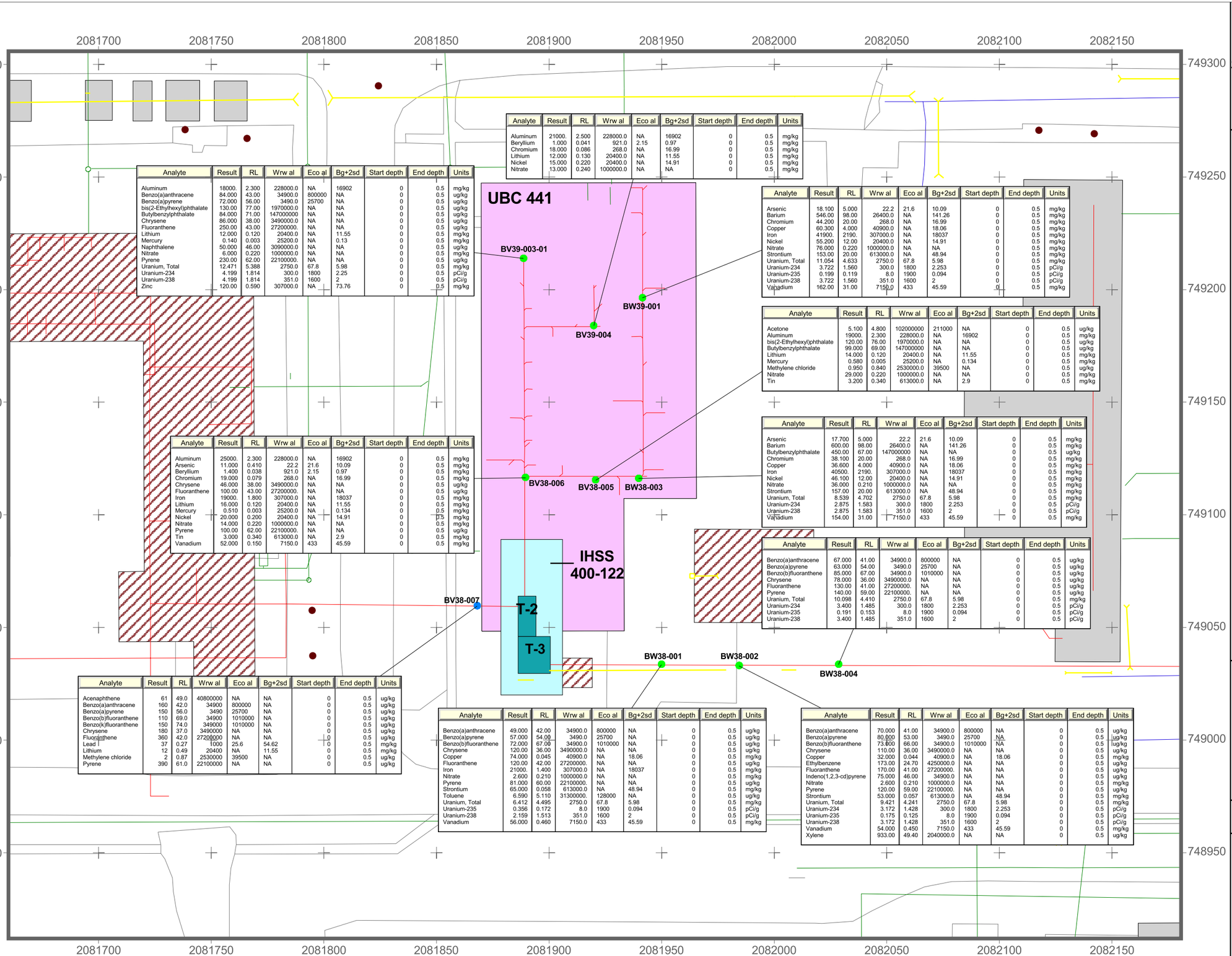
Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS

File: W/Projects/Fy2003/400-8 /Closeout Report/400-8_closeout.apr

Date: 03/22/04

FIGURE 4
IHSS Group 400-8
Accelerated Action Surface Sampling Locations and Results
Greater Than Background Means Plus Two Standard Deviations or Reporting Limits



Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Aluminum	21000.	2.500	228000.0	NA	16902	0	0.5	mg/kg
Beryllium	1.000	0.041	921.0	2.15	0.97	0	0.5	mg/kg
Chromium	18.000	0.086	268.0	NA	16.99	0	0.5	mg/kg
Lithium	12.000	0.130	20400.0	NA	11.55	0	0.5	mg/kg
Nickel	15.000	0.220	20400.0	NA	14.91	0	0.5	mg/kg
Nitrate	13.000	0.240	1000000.0	NA	NA	0	0.5	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Aluminum	18000.	2.300	228000.0	NA	16902	0	0.5	mg/kg
Benzo(a)anthracene	84.000	43.00	34900.0	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	72.000	56.00	3490.0	25700	NA	0	0.5	ug/kg
bis(2-Ethylhexyl)phthalate	130.00	77.00	1970000.0	NA	NA	0	0.5	ug/kg
Butylbenzylphthalate	84.000	71.00	147000000	NA	NA	0	0.5	ug/kg
Chrysene	86.000	38.00	3490000.0	NA	NA	0	0.5	ug/kg
Fluoranthene	250.00	43.00	27200000.	NA	NA	0	0.5	ug/kg
Lithium	12.000	0.120	20400.0	NA	11.55	0	0.5	mg/kg
Mercury	0.140	0.003	25200.0	NA	0.13	0	0.5	mg/kg
Naphthalene	50.000	46.00	3090000.0	NA	NA	0	0.5	ug/kg
Nitrate	6.000	0.220	1000000.0	NA	NA	0	0.5	mg/kg
Pyrene	230.00	62.00	22100000.	NA	NA	0	0.5	ug/kg
Uranium, Total	12.471	5.388	2750.0	67.8	5.98	0	0.5	mg/kg
Uranium-234	4.199	1.814	300.0	1800	2.25	0	0.5	pCi/g
Uranium-238	4.199	1.814	351.0	1600	2	0	0.5	pCi/g
Zinc	120.00	0.590	307000.0	NA	73.76	0	0.5	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Arsenic	18.100	5.000	22.2	21.6	10.09	0	0.5	mg/kg
Barium	546.00	98.00	26400.0	NA	141.26	0	0.5	mg/kg
Chromium	44.200	20.00	268.0	NA	16.99	0	0.5	mg/kg
Copper	60.300	4.000	40900.0	NA	18.06	0	0.5	mg/kg
Iron	41900.	2190.	307000.0	NA	18037	0	0.5	mg/kg
Nickel	55.200	12.00	20400.0	NA	14.91	0	0.5	mg/kg
Nitrate	76.000	0.220	1000000.0	NA	NA	0	0.5	mg/kg
Strontium	153.00	20.00	613000.0	NA	48.94	0	0.5	mg/kg
Uranium, Total	11.054	4.633	2750.0	67.8	5.98	0	0.5	mg/kg
Uranium-234	3.722	1.560	300.0	1800	2.253	0	0.5	pCi/g
Uranium-235	0.199	0.119	8.0	1900	0.094	0	0.5	pCi/g
Uranium-238	3.722	1.560	351.0	1600	2	0	0.5	pCi/g
Vanadium	162.00	31.00	7150.0	433	45.59	0	0.5	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Acetone	5.100	4.800	102000000	211000	NA	0	0.5	ug/kg
Aluminum	19000.	2.300	228000.0	NA	16902	0	0.5	mg/kg
bis(2-Ethylhexyl)phthalate	120.00	76.00	1970000.0	NA	NA	0	0.5	ug/kg
Butylbenzylphthalate	99.000	69.00	147000000	NA	NA	0	0.5	ug/kg
Lithium	14.000	0.120	20400.0	NA	11.55	0	0.5	mg/kg
Mercury	0.580	0.005	25200.0	NA	0.134	0	0.5	mg/kg
Methylene chloride	0.950	0.840	2530000.0	39500	NA	0	0.5	ug/kg
Nitrate	29.000	0.220	1000000.0	NA	NA	0	0.5	mg/kg
Tin	3.200	0.340	613000.0	NA	2.9	0	0.5	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Aluminum	25000.	2.300	228000.0	NA	16902	0	0.5	mg/kg
Arsenic	11.000	0.410	22.2	21.6	10.09	0	0.5	mg/kg
Beryllium	1.400	0.038	921.0	2.15	0.97	0	0.5	mg/kg
Chromium	19.000	0.079	268.0	NA	16.99	0	0.5	mg/kg
Chrysene	46.000	38.00	3490000.0	NA	NA	0	0.5	ug/kg
Fluoranthene	100.00	43.00	27200000.	NA	NA	0	0.5	ug/kg
Iron	19000.	1.800	307000.0	NA	18037	0	0.5	mg/kg
Lithium	16.000	0.120	20400.0	NA	11.55	0	0.5	mg/kg
Mercury	0.510	0.003	25200.0	NA	0.134	0	0.5	mg/kg
Nickel	20.000	0.200	20400.0	NA	14.91	0	0.5	mg/kg
Nitrate	14.000	0.220	1000000.0	NA	NA	0	0.5	mg/kg
Pyrene	100.00	62.00	22100000.	NA	NA	0	0.5	ug/kg
Tin	3.000	0.340	613000.0	NA	2.9	0	0.5	mg/kg
Vanadium	52.000	0.150	7150.0	433	45.59	0	0.5	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Arsenic	17.700	5.000	22.2	21.6	10.09	0	0.5	mg/kg
Barium	600.00	98.00	26400.0	NA	141.26	0	0.5	mg/kg
Butylbenzylphthalate	450.00	67.00	147000000	NA	NA	0	0.5	ug/kg
Chromium	38.100	20.00	268.0	NA	16.99	0	0.5	mg/kg
Copper	36.600	4.000	40900.0	NA	18.06	0	0.5	mg/kg
Iron	40500.	2190.	307000.0	NA	18037	0	0.5	mg/kg
Nickel	46.100	12.00	20400.0	NA	14.91	0	0.5	mg/kg
Nitrate	36.000	0.210	1000000.0	NA	NA	0	0.5	mg/kg
Strontium	157.00	20.00	613000.0	NA	48.94	0	0.5	mg/kg
Uranium, Total	8.539	4.702	2750.0	67.8	5.98	0	0.5	mg/kg
Uranium-234	2.875	1.583	300.0	1800	2.253	0	0.5	pCi/g
Uranium-238	2.875	1.583	351.0	1600	2	0	0.5	pCi/g
Vanadium	154.00	31.00	7150.0	433	45.59	0	0.5	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Benzo(a)anthracene	67.000	41.00	34900.0	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	63.000	54.00	3490.0	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	85.000	67.00	34900.0	1010000	NA	0	0.5	ug/kg
Chrysene	78.000	36.00	3490000.0	NA	NA	0	0.5	ug/kg
Fluoranthene	130.00	41.00	27200000.	NA	NA	0	0.5	ug/kg
Pyrene	140.00	59.00	22100000.	NA	NA	0	0.5	ug/kg
Uranium, Total	10.098	4.410	2750.0	67.8	5.98	0	0.5	mg/kg
Uranium-234	3.400	1.485	300.0	1800	2.253	0	0.5	pCi/g
Uranium-235	0.191	0.153	8.0	1900	0.094	0	0.5	pCi/g
Uranium-238	3.400	1.485	351.0	1600	2	0	0.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Acenaphthene	61	49.0	40800000	NA	NA	0	0.5	ug/kg
Benzo(a)anthracene	160	42.0	34900	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	150	56.0	3490	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	110	69.0	34900	1010000	NA	0	0.5	ug/kg
Benzo(k)fluoranthene	150	74.0	349000	1010000	NA	0	0.5	ug/kg
Chrysene	180	37.0	3490000	NA	NA	0	0.5	ug/kg
Fluoranthene	360	42.0	27200000	NA	NA	0	0.5	ug/kg
Lead	37	0.27	1000	25.6	54.62	0	0.5	mg/kg
Lithium	12	0.49	20400	NA	11.55	0	0.5	mg/kg
Methylene chloride	2	0.87	2530000	39500	NA	0	0.5	ug/kg
Pyrene	390	61.0	22100000	NA	NA	0	0.5	ug/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Benzo(a)anthracene	49.000	42.00	34900.0	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	57.000	54.00	3490.0	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	72.000	67.00	34900.0	1010000	NA	0	0.5	ug/kg
Chrysene	120.00	36.00	3490000.0	NA	NA	0	0.5	ug/kg
Copper	74.000	0.045	40900.0	NA	18.06	0	0.5	mg/kg
Fluoranthene	120.00	42.00	27200000.	NA	NA	0	0.5	ug/kg
Iron	21000.	1.400	307000.0	NA	18037	0	0.5	mg/kg
Nitrate	2.600	0.210	1000000.0	NA	NA	0	0.5	mg/kg
Pyrene	81.000	60.00	22100000.	NA	NA	0	0.5	ug/kg
Strontium	65.000	0.058	613000.0	NA	48.94	0	0.5	mg/kg
Toluene	6.590	5.110	31300000.	128000	NA	0	0.5	ug/kg
Uranium, Total	6.412	4.495	2750.0	67.8	5.98	0	0.5	mg/kg
Uranium-235	0.356	0.172	8.0	1900	0.094	0	0.5	pCi/g
Uranium-238	2.159	1.513	351.0	1600	2	0	0.5	pCi/g
Vanadium	56.000	0.460	7150.0	433	45.59	0	0.5	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Benzo(a)anthracene	70.000	41.00	34900.0	800000	NA	0	0.5	ug/kg
Benzo(a)pyrene	80.000	53.00	3490.0	25700	NA	0	0.5	ug/kg
Benzo(b)fluoranthene	73.000	66.00	34900.0	1010000	NA	0	0.5	ug/kg
Chrysene	110.00	36.00	3490000.0	NA	NA	0	0.5	ug/kg
Copper	32.000	0.044	40900.0	NA	18.06	0	0.5	mg/kg
Ethylbenzene	173.00	24.70	4250000.0	NA	NA	0	0.5	ug/kg
Fluoranthene	170.00	41.00	27200000.	NA	NA	0	0.5	ug/kg
Indeno(1,2,3-cd)pyrene	75.000	46.00	34900.0	NA	NA	0	0.5	ug/kg
Nitrate	2.600	0.210	1000000.0	NA	NA	0	0.5	mg/kg
Pyrene	120.00	59.00	22100000.	NA	NA	0	0.5	ug/kg
Strontium	53.000	0.057	613000.0	NA	48.94	0	0.5	mg/kg
Uranium, Total	9.421	4.241	2750.0	67.8	5.98	0	0.5	mg/kg
Uranium-234	3.172	1.428	300.0	1800	2.253	0	0.5	pCi/g
Uranium-235	0.175	0.125	8.0	1900	0.094	0	0.5	pCi/g
Uranium-238	3.172	1.428	351.0	1600	2	0	0.5	pCi/g
Vanadium	54.000	0.450	7150.0	433	45.59	0	0.5	mg/kg
Xylene	933.00	49.40	2040000.0	NA	NA	0	0.5	ug/kg

KEY

- Greater than Wildlife Refuge Worker Action Level
- Greater than Ecological Receptor Action Level
- Detection greater than Background Means + 2 Standard Deviations or Reporting Limits and less than Action Levels
- Manhole
- IHSS 400-122
- UBC 441
- Tanks
- Building - standing
- Building - demolished
- Paved road
- Original Process Waste Line (OPWL)
- Sewer
- Storm drain

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20 0 20 40 60 Feet

Scale = 1:500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS

Date: 03/22/04

File: W/Projects/Fy2003/400-8
/Closeout Report/400-8_closeout.apr

FIGURE 5

IHSS Group 400-8 Accelerated Action Subsurface Sampling Locations and Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

KEY

- Greater than Wildlife Refuge Worker Action Level
- Greater than Ecological Receptor Action Level
- Detection greater than Background Means + 2 Standard Deviations or Reporting Limits and less than Action Levels
- Less than Background Means + 2 Standard Deviations or Reporting Limits
- Manhole
- IHSS 400-122
- UBC 441
- Tanks
- Building - standing
- Building - demolished
- Paved road
- Original Process Waste Line (OPWL)
- Sewer
- Storm drain

N

Scale = 1:600

25 0 25 50 75 100 125 150 175 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS

File: w/projects/Fy2003/400-8 /Closeout Report/400-8_closeout.apr

Date: 03/22/04

2081400 2081600 2081800 2082000 2082200 2082400 2082600

749400 749200 749000 748800 748600

UBC-441 BV39-000 BV39-001 BV39-002 BV39-003-01 BV39-004 BV39-006 BV39-007 BV38-005 BV38-003 BV38-006 BV38-008 IHSS 400-122 T-2 T-3 T-4 T441A BV38-009 BV38-010 BV38-011 BV38-007 BV38-002 BV38-001 BV38-002 BV38-004 BV38-003 BV38-004

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Nitrate	43.000	0.230	1000000.0	NA	NA	2.0	2.5	mg/kg
Uranium, Total	10.906	5.402	2750.0	67.8	3.04	2.0	2.5	mg/kg
Uranium-234	3.672	1.819	300.0	1800	2.64	2.0	2.5	pCi/g
Uranium-235	0.147	0.120	8.0	1900	0.12	2.0	2.5	pCi/g
Uranium-238	3.672	1.819	351.0	1600	1.49	2.0	2.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Benzo(a)anthracene	62.000	46.00	34900.0	800000	NA	2.0	2.3	ug/kg
Chrysene	60.000	40.00	3490000.0	NA	NA	2.0	2.3	ug/kg
Fluoranthene	120.00	46.00	27200000.	NA	NA	2.0	2.3	ug/kg
Nitrate	6.100	0.240	1000000.0	NA	NA	2.0	2.3	mg/kg
Pyrene	120.00	66.00	22100000.	NA	NA	2.0	2.3	ug/kg
Uranium, Total	12.435	5.062	2750.0	67.8	3.04	2.0	2.3	mg/kg
Uranium-234	4.187	1.704	300.0	1800	2.64	2.0	2.3	pCi/g
Uranium-235	0.182	0.135	8.0	1900	0.12	2.0	2.3	pCi/g
Uranium-238	4.187	1.704	351.0	1600	1.49	2.0	2.3	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Lead	55.000	0.210	1000.0	25.6	24.97	2.0	2.5	mg/kg
Nitrate	29.000	0.230	1000000.0	NA	NA	2.0	2.5	mg/kg
Uranium, Total	44.000	0.610	2750.0	67.8	3.04	2.0	2.5	mg/kg
Uranium-234	4.154	1.525	300.0	1800	2.64	2.0	2.5	pCi/g
Uranium-235	0.170	0.128	8.0	1900	0.12	2.0	2.5	pCi/g
Uranium-238	4.154	1.525	351.0	1600	1.49	2.0	2.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Nitrate	44.000	0.230	1000000.0	NA	NA	6.2	6.5	mg/kg
Uranium, Total	12.830	5.509	2750.0	67.8	3.04	6.2	6.5	mg/kg
Uranium-234	4.320	1.855	300.0	1800	2.64	6.2	6.5	pCi/g
Uranium-235	0.167	0.150	8.0	1900	0.12	6.2	6.5	pCi/g
Uranium-238	4.320	1.855	351.0	1600	1.49	6.2	6.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Lead	100.00	0.220	1000.0	25.6	24.97	4.5	6.5	mg/kg
Uraqium, Total	8.070	5.076	2750.0	67.8	3.04	4.5	6.5	mg/kg
Uranium-234	2.717	1.709	300.0	1800	2.64	4.5	6.5	pCi/g
Uranium-238	2.717	1.709	351.0	1600	1.49	4.5	6.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Uranium, Total	10.909	5.880	2750.0	67.8	3.04	4.5	6.5	mg/kg
Uranium-234	3.673	1.980	300.0	1800	2.64	4.5	6.5	pCi/g
Uranium-235	0.223	0.147	8.0	1900	0.12	4.5	6.5	pCi/g
Uranium-238	3.673	1.980	351.0	1600	1.49	4.5	6.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Uranium-235	0.179	0.102	8.0	1900	0.12	9.5	10.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Chromium	200.00	0.170	268.0	NA	68.27	5.0	5.5	mg/kg
Copper	810.00	0.052	40900.0	NA	38.21	5.0	5.5	mg/kg
Lead	32.000	0.210	1000.0	25.6	24.97	5.0	5.5	mg/kg
Mercury	6.000	0.079	25200.0	NA	1.52	5.0	5.5	mg/kg
Tetrachloroethene	6.810	5.550	615000.0	37500	NA	5.0	5.5	ug/kg
Uranium, Total	10.000	1.600	2750.0	67.8	3.04	5.0	5.5	mg/kg
Uranium-234	4.706	1.510	300.0	1800	2.64	5.0	5.5	pCi/g
Uranium-235	0.214	0.121	8.0	1900	0.12	5.0	5.5	pCi/g
Uranium-238	4.706	1.510	351.0	1600	1.49	5.0	5.5	pCi/g
Uranium, Total	3.312	2.561	2750.0	67.8	3.04	5.0	8.0	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Lead	25.400	0.280	1000.0	25.6	24.97	6.5	8.5	mg/kg
Tetrachloroethene	20.400	5.610	615000.0	37500	NA	6.5	8.5	ug/kg
Uranium, Total	4.330	3.181	2750.0	67.8	3.04	6.5	8.5	mg/kg
Uranium-235	0.121	0.103	8.0	1900	0.12	6.5	8.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
2-Methylnaphthalene	1300.0	39.00	20400000.	NA	NA	10.	11.	ug/kg
2-Methylphenol	74.000	51.00	36900000.	NA	NA	10.	11.	ug/kg
4-Methylphenol	350.00	67.00	3690000.0	NA	NA	10.	11.	ug/kg
Acenaphthene	3400.0	38.00	40800000.	NA	NA	10.	11.	ug/kg
Anthracene	2800.0	29.00	204000000	NA	NA	10.	11.	ug/kg
Benzene	58.700	26.00	205000.0	NA	NA	10.	11.	ug/kg
Benzo(a)anthracene	3600.0	30.00	34900.0	800000	NA	10.	11.	ug/kg
Benzo(a)pyrene	3700.0	49.00	3490.0	25700	NA	10.	11.	ug/kg
Benzo(b)fluoranthene	2600.0	35.00	34900.0	1010000	NA	10.	11.	ug/kg
Benzo(k)fluoranthene	3300.0	39.00	349000.0	1010000	NA	10.	11.	ug/kg
Beryllium	190.00	0.100	921.0	2.15	14.2	10.	11.	mg/kg
Chloroform	1980.0	345.0	19200.0	101000	NA	10.	11.	ug/kg
Chrysene	4100.0	34.00	3490000.0	NA	NA	10.	11.	ug/kg
Dibenz(a,h)anthracene	940.00	30.00	3490.0	NA	NA	10.	11.	ug/kg
Dibenzofuran	1900.0	44.00	2950000.0	NA	NA	10.	11.	ug/kg
Ethylbenzene	214.00	26.00	4250000.0	NA	NA	10.	11.	ug/kg
Fluoranthene	7000.0	28.00	27200000.	NA	NA	10.	11.	ug/kg
Fluorene	2700.0	42.00	40800000.	NA	NA	10.	11.	ug/kg
Indeno(1,2,3-cd)pyrene	2000.0	28.00	34900.0	NA	NA	10.	11.	ug/kg
Lead	51.000	0.320	1000.0	25.6	24.97	10.	11.	mg/kg
Mercury	19.000	0.081	25200.0	NA	1.52	10.	11.	mg/kg
Naphthalene	2000.0	39.00	3090000.0	NA	NA	10.	11.	ug/kg
Phenol	600.00	43.00	613000000	NA	NA	10.	11.	ug/kg
Pyrene	7800.0	160.0	22100000.	NA	NA	10.	11.	ug/kg
Tetrachloroethene	18600.	695.0	615000.0	37500	NA	10.	11.	ug/kg
Toluene	144.00	26.00	31300000.	128000	NA	10.	11.	ug/kg
Trichloroethene	1630.0	345.0	19600.0	509000	NA	10.	11.	ug/kg
Uranium, Total	57.000	1.600	2750.0	67.8	3.04	10.	11.	mg/kg
Uranium-234	4.175	1.446	300.0	1800	2.64	10.	11.	pCi/g
Uranium-238	4.175	1.446	351.0	1600	1.49	10.	11.	pCi/g
Xylene	1120.0	52.10	2040000.0	NA	NA	10.	11.	ug/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
2-Methylnaphthalene	54.000	35.00	20400000.	NA	NA	12.5	17.0	ug/kg
Acenaphthene	110.00	34.00	40800000.	NA	NA	12.5	17.0	ug/kg
Anthracene	75.000	26.00	204000000	NA	NA	12.5	17.0	ug/kg
Benzo(a)anthracene	95.000	27.00	34900.0	800000	NA	12.5	17.0	ug/kg
Chrysene	120.00	31.00	3490000.0	NA	NA	12.5	17.0	ug/kg
Dibenzofuran	73.000	40.00	2950000.0	NA	NA	12.5	17.0	ug/kg
Fluoranthene	230.00	25.00	27200000.	NA	NA	12.5	17.0	ug/kg
Fluorene	89.000	38.00	40800000.	NA	NA	12.5	17.0	ug/kg
Nitrate	2.600	0.230	1000000.0	NA	NA	12.5	17.0	mg/kg
Phenol	44.000	39.00	613000000	NA	NA	12.5	17.0	ug/kg
Pyrene	240.00	150.0	22100000.	NA	NA	12.5	17.0	ug/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
1,2-Dichloropropane	71.600	6.060	345000.0	NA	NA	12.5	15.5	ug/kg
Acenaphthene	84.000	36.00	40800000.	NA	NA	12.5	15.5	ug/kg
Anthracene	100.00	28.00	204000000	NA	NA	12.5	15.5	ug/kg
Benzo(a)anthracene	220.00	29.00	34900.0	800000	NA	12.5	15.5	ug/kg
Benzo(b)fluoranthene	170.00	34.00	34900.0	1010000	NA	12.5	15.5	ug/kg
Benzo(k)fluoranthene	230.00	38.00	349000.0	1010000	NA	12.5	15.5	ug/kg
Chrysene	270.00	33.00	3490000.0	NA	NA	12.5	15.5	ug/kg
Fluoranthene	490.00	27.00	27200000.	NA	NA	12.5	15.5	ug/kg
Fluorene	65.000	40.00	40800000.	NA	NA	12.5	15.5	ug/kg
Indeno(1,2,3-cd)pyrene	130.00	27.00	34900.0	NA	NA	12.5	15.5	ug/kg
Nitrate	4.300	0.240	1000000.0	NA	NA	12.5	15.5	mg/kg
Pyrene	560.00	160.0	22100000.	NA	NA	12.5	15.5	ug/kg
Tetrachloroethene	14.000	6.060	615000.0	37500	NA	12.5	15.5	ug/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Nitrate	3.000	0.220	1000000.0	NA	NA	12.5	15.5	mg/kg
Plutonium-239/240	0.565	0.120	50.0	3800	0.02	12.5	15.5	pCi/g
Uranium, Total	3.356	0.324	2750.0	67.8	3.04	12.5	15.5	mg/kg
Aluminum	41000.	5.300	2280000.0	NA	35373.17	12.5	15.5	mg/kg
bis(2-Ethylhexyl)phthalate	150.00	83.00	1970000.0	NA	NA	12.5	15.5	ug/kg
Uranium, Total	13.956	5.146	2750.0	67.8	3.04	12.5	15.5	mg/kg
Uranium-234	4.699	1.732	300.0	1800	2.64	12.5	15.5	pCi/g
Uranium-238	4.699	1.732	351.0	1600	1.49	12.5	15.5	pCi/g
Nitrate	2.500	0.230	1000000.0	NA	NA	12.5	15.5	mg/kg
Uranium, Total	9.703	4.969	2750.0	67.8	3.04	12.5	15.5	mg/kg
Uranium-234	3.267	1.673	300.0	1800	2.64	12.5	15.5	pCi/g
Uranium-238	3.267	1.673	351.0	1600	1.49	12.5	15.5	pCi/g
Nitrate	2.700	0.220	1000000.0	NA	NA	12.5	15.5	mg/kg
Uranium, Total	12.780	4.589	2750.0	67.8	3.04	12.5	15.5	mg/kg
Uranium-234	4.303	1.545	300.0	1800	2.64	12.5	15.5	pCi/g
Uranium-238	4.303	1.545	351.0	1600	1.49	12.5	15.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Arsenic	13.300	5.000	22.2	21.6	13.14	2.0	2.0	mg/kg
Barium	556.00	98.00	26400.0	NA	289.38	2.0	2.0	mg/kg
Copper	58.100	4.000	40900.0	NA	38.21	2.0	2.0	mg/kg
Iron	41400.	2190.	307000.0	NA	41046.52	2.0	2.0	mg/kg
Nitrate	9.700	0.220	1000000.0	NA	NA	2.0	2.0	mg/kg
Uranium, Total	11.936	5.139	2750.0	67.8	3.04	2.0	2.0	mg/kg
Uranium-234	4.019	1.730	300.0	1800	2.64	2.0	2.0	pCi/g
Uranium-235	0.179	0.141	8.0	1900	0.12	2.0	2.0	pCi/g
Uranium-238	4.019	1.730	351.0	1600	1.49	2.0	2.0	pCi/g
Vanadium	135.00	31.00	7150.0	433	88.49	2.0	2.0	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
2-Methylnaphthalene	820.00	41.00	20400000.	NA	NA	2.5	4.5	ug/kg
bis(2-Ethylhexyl)phthalate	340.00	82.00	1970000.0	NA	NA	2.5	4.5	ug/kg
Butylbenzylphthalate	6000.0	75.00	147000000	NA	NA	2.5	4.5	ug/kg
Chrysene	52.000	40.00	3490000.0	NA	NA	2.5	4.5	ug/kg
Ethylbenzene	112.00	27.90	4250000.0	NA	NA	2.5	4.5	ug/kg
Fluoranthene	61.000	46.00	27200000.	NA	NA	2.5	4.5	ug/kg
Naphthalene	3700.0	49.00	3090000.0	NA	NA	2.5	4.5	ug/kg
Nitrate	10.000	0.240	1000000.0	NA	NA	2.5	4.5	mg/kg
Pyrene	71.000	66.00	22100000.	NA	NA	2.5	4.5	ug/kg
Uranium, Total	12.275	5.150	2750.0	67.8	3.04	2.5	4.5	mg/kg
Uranium-234	4.133	1.734	300.0	1800	2.64	2.5	4.5	pCi/g
Uranium-235	0.237	0.139	8.0	1900	0.12	2.5	4.5	pCi/g
Uranium-238	4.133	1.734	351.0	1600	1.49	2.5	4.5	pCi/g
Xylene	552.00	55.70	2040000.0	NA	NA	2.5	4.5	ug/kg
2-Methylnaphthalene	51.000	42.00	20400000.	NA	NA	4.5	6.5	ug/kg
Butylbenzylphthalate	490.00	76.00	147000000	NA	NA	4.5	6.5	ug/kg
Naphthalene	190.00	50.00	3090000.0	NA	NA	4.5	6.5	ug/kg
Nitrate	8.100	0.240	1000000.0	NA	NA	4.5	6.5	mg/kg
Uranium, Total	11.883	4.849	2750.0	67.8	3.04	4.5	6.5	mg/kg
Uranium-234	4.001	1.633	300.0	1800	2.64	4.5	6.5	pCi/g
Uranium-235	0.156	0.134	8.0	1900	0.12	4.5	6.5	pCi/g
Uranium-238	4.001	1.633	351.0	1600	1.49	4.5	6.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Arsenic	14.000	0.440	22.2	21.6	13.14	5.0	5.0	mg/kg
Benzo(a)anthracene	48.000	46.00	34900.0	800000	NA	5.0	5.0	ug/kg
Chrysene	49.000	40.00	3490000.0	NA	NA	5.0	5.0	ug/kg
Fluoranthene	130.00	46.00	27200000.	NA	NA	5.0	5.0	ug/kg
Lead	38.000	0.210	1000.0	25.6	24.97	5.0	5.0	mg/kg
Pyrene	100.00	66.00	22100000.	NA	NA	5.0	5.0	ug/kg
Uranium, Total	7.547	3.831	2750.0	67.8	3.04	5.0	5.0	mg/kg
Uranium-238	2.541	1.290	351.0	1600	1.49	5.0	5.0	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Barium	551.00	98.00	26400.0	NA	289.38	4.0	4.0	mg/kg
Copper	38.600	4.000	40900.0	NA	38.21	4.0	4.0	mg/kg
Iron	42700.	2190.	307000.0	NA	41046.52	4.0	4.0	mg/kg
Lead	942.00	7.000	1000.0	25.6	24.97	4.0	4.0	mg/kg
Nitrate	8.500	0.230	1000000.0	NA	NA	4.0	4.0	mg/kg
Selenium	5.940	1.000	5110.0	NA	4.8	4.0	4.0	mg/kg
Uranium, Total	10.927	5.011	2750.0	67.8	3.04	4.0	4.0	mg/kg
Uranium-234	3.679	1.687	300.0	1800	2.64	4.0	4.0	pCi/g
Uranium-235	0.187	0.141	8.0	1900	0.12	4.0	4.0	pCi/g
Uranium-238	3.679	1.687	351.0	1600	1.49	4.0	4.0	pCi/g
Vanadium	164.00	31.00	7150.0	433	88.49	4.0	4.0	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Acenaphthene	130.00	49.00	40800000.	NA	NA	0.5	2.5	ug/kg
Anthracene	160.00	71.00	204000000	NA	NA	0.5	2.5	ug/kg
Benzo(a)anthracene	360.00	43.00	34900.0	800000	NA	0.5	2.5	ug/kg
Benzo(a)pyrene	370.00	56.00	3490.0	25700	NA	0.5	2.5	ug/kg
Benzo(b)fluoranthene	470.00	69.00	34900.0	1010000	NA	0.5	2.5	ug/kg
Benzo(k)fluoranthene	170.00	75.00	349000.0	1010000	NA	0.5	2.5	ug/kg
Chrysene	420.00	37.00	3490000.0	NA	NA	0.5	2.5	ug/kg
Dibenz(a,h)anthracene	75.000	68.00	3490.0	NA	NA	0.5	2.5	ug/kg
Fluoranthene	930.00	43.00	27200000.	NA	NA	0.5	2.5	ug/kg
Fluorene	94.000	59.00	40800000.	NA	NA	0.5	2.5	ug/kg
Indeno(1,2,3-cd)pyrene	230.00	48.00	34900.0	NA	NA	0.5	2.5	ug/kg
Pyrene	890.00	62.00	22100000.	NA	NA	0.5	2.5	ug/kg
Uranium, Total	11.622	4.655	2750.0	67.8	3.04	0.5	2.5	mg/kg
Uranium-234	3.913	1.567	300.0	1800	2.64	0.5	2.5	pCi/g
Uranium-235	0.197	0.140	8.0	1900	0.12	0.5	2.5	pCi/g
Uranium-238	3.913	1.567	351.0	1600	1.49	0.5	2.5	pCi/g
Uranium, Total	12.017	4.140	2750.0	67.8	3.04	2.5	4.5	mg/kg
Uranium-234	4.046	1.394	300.0	1800	2.64	2.5	4.5	pCi/g
Uranium-235	0.203	0.110	8.0	1900	0.12	2.5	4.5	pCi/g
Uranium-238	4.046	1.394	351.0	1600	1.49	2.5	4.5	pCi/g
Arsenic	23.000	0.810	22.2	21.6	13.14	4.5	6.5	mg/kg
Beryllium	2.300	0.100	921.0	2.15	14.2	4.5	6.5	mg/kg
Nitrate	2.800	0.220	1000000.0	NA	NA	4.5	6.5	mg/kg
Uranium, Total	11.874	5.014	2750.0	67.8	3.04	4.5	6.5	mg/kg
Uranium-234	3.998	1.688	300.0	1800	2.64	4.5	6.5	pCi/g
Uranium-235	0.238	0.152	8.0	1900	0.12	4.5	6.5	pCi/g
Uranium-238	3.998	1.688	351.0	1600	1.49	4.5	6.5	pCi/g
Methylene chloride	1.400	0.860	2530000.0	39500	NA	6.5	8.5	ug/kg
Nitrate	2.900	0.210	1000000.0	NA	NA	6.5	8.5	mg/kg

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Benzo(a)anthracene	70.000	43.00	34900.0	800000	NA	0.5	2.5	ug/kg
Benzo(a)pyrene	72.000	56.00	3490.0	25700	NA	0.5	2.5	ug/kg
Benzo(b)fluoranthene	70.000	70.00	34900.0	1010000	NA	0.5	2.5	ug/kg
Chrysene	67.000	38.00	3490000.0	NA	NA	0.5	2.5	ug/kg
Fluoranthene	140.00	43.00	27200000.	NA	NA	0.5	2.5	ug/kg
Indeno(1,2,3-cd)pyrene	51.000	49.00	34900.0	NA	NA	0.5	2.5	ug/kg
Nitrate	3.700	0.230	1000000.0	NA	NA	0.5	2.5	mg/kg
Pyrene	140.00	62.00	22100000.	NA	NA	0.5	2.5	ug/kg
Uranium, Total	15.616	5.391	2750.0	67.8	3.04	0.5	2.5	mg/kg
Uranium-234	5.258	1.815	300.0	1800	2.64	0.5	2.5	pCi/g
Uranium-235	0.189	0.109	8.0	1900	0.12	0.5	2.5	pCi/g
Uranium-238	5.258	1.815	351.0	1600	1.49	0.5	2.5	pCi/g
Acenaphthene	330.00	48.00	40800000.	NA	NA	2.5	4.5	ug/kg
Anthracene	370.00	69.00	204000000	NA	NA	2.5	4.5	ug/kg
Benzo(a)anthracene	710.00	41.00	34900.0	800000	NA	2.5	4.5	ug/kg
Benzo(a)pyrene	700.00	54.00	3490.0	25700	NA	2.5	4.5	ug/kg
Benzo(b)fluoranthene	740.00	67.00	34900.0	1010000	NA	2.5	4.5	ug/kg
Benzo(k)fluoranthene	410.00	72.00	349000.0	1010000	NA	2.5	4.5	ug/kg
Chrysene	790.00	36.00	3490000.0	NA	NA	2.5	4.5	ug/kg
Dibenz(a,h)anthracene	110.00	66.00	3490.0	NA	NA	2.5	4.5	ug/kg
Dibenzofuran	97.000	53.00	2950000.0	NA	NA	2.5	4.5	ug/kg
Fluoranthene	1800.0	41.00	27200000.	NA	NA	2.5	4.5	ug/kg
Fluorene	220.00	57.00	40800000.	NA	NA	2.5	4.5	ug/kg
Indeno(1,2,3-cd)pyrene	430.00	47.00	34900.0	NA	NA	2.5	4.5	ug/kg
Naphthalene	81.000	45.00	3090000.0	NA	NA	2.5	4.5	ug/kg
Nitrate	4.800	0.230	1000000.0	NA	NA	2.5	4.5	mg/kg
Pyrene	1800.0	59.00	22100000.	NA	NA	2.5	4.5	ug/kg
Uranium, Total	6.460	4.676	2750.0	67.8	3.04	2.5	4.5	mg/kg
Uranium-238	2.175	1.574	351.0	1600	1.49	2.5	4.5	pCi/g
Nitrate	3.000	0.220	1000000.0	NA	NA	4.5	6.5	mg/kg
Uranium, Total	9.219	4.977	2750.0	67.8	3.04	4.5	6.5	mg/kg
Uranium-234	3.104	1.676	300.0	1800	2.64	4.5	6.5	pCi/g
Uranium-235	0.183	0.121	8.0	1900	0.12	4.5	6.5	pCi/g
Uranium-238	3.104	1.676	351.0	1600	1.49	4.5	6.5	pCi/g
Nitrate	3.000	0.220	1000000.0	NA	NA	6.5	8.5	mg/kg
Uranium, Total	11.188	3.707	2750.0	67.8	3.04	6.5	8.5	mg/kg
Uranium-234	3.767	1.248	300.0	1800	2.64	6.5	8.5	pCi/g
Uranium-235	0.151	0.119	8.0	1900	0.12	6.5	8.5	pCi/g
Uranium-238	3.767	1.248	351.0	1600	1.49	6.5	8.5	pCi/g

Table 3
IHSS Group 400-8 Accelerated Action Characterization Data Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 400-122	BV38-002	2081890.490	749050.500	2-Methylnaphthalene	1300	39	NA	10	11	20400000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	2-Methylphenol	74	51	NA	10	11	36900000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	4-Methylphenol	350	67	NA	10	11	3690000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Acenaphthene	3400	38	NA	10	11	40800000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Anthracene	2800	29	NA	10	11	204000000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Benzene	58.7	26	NA	10	11	205000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Benzo(a)anthracene	3600	30	NA	10	11	34900	800000	ug/kg
IHSS 400-122	**BV38-002**	**2081890.490**	**749050.500**	**Benzo(a)pyrene**	**3700**	**49**	NA	**10**	**11**	**3490**	**25700**	**ug/kg**
IHSS 400-122	BV38-002	2081890.490	749050.500	Benzo(b)fluoranthene	2600	35	NA	10	11	34900	1010000	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Benzo(k)fluoranthene	3300	39	NA	10	11	349000	1010000	ug/kg
IHSS 400-122	**BV38-002**	**2081890.490**	**749050.500**	**Beryllium**	**190**	**0.12**	**14.2**	**10**	**11**	**921**	**2.15**	**mg/kg**
IHSS 400-122	BV38-002	2081890.490	749050.500	Chloroform	1980	345	NA	10	11	19200	101000	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Chrysene	4100	34	NA	10	11	3490000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Dibenz(a,h)anthracene	940	30	NA	10	11	3490	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Dibenzofuran	1900	44	NA	10	11	2950000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Ethylbenzene	214	26	NA	10	11	4250000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Fluoranthene	7000	28	NA	10	11	27200000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Fluorene	2700	42	NA	10	11	40800000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Indeno(1,2,3-cd)pyrene	2000	28	NA	10	11	34900	NA	ug/kg
IHSS 400-122	**BV38-002**	**2081890.490**	**749050.500**	**Lead**	**51**	**0.32**	**24.97**	**10**	**11**	**1000**	**25.6**	**mg/kg**
IHSS 400-122	BV38-002	2081890.490	749050.500	Mercury	19	0.081	1.52	10	11	25200	NA	mg/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Naphthalene	2000	39	NA	10	11	3090000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Phenol	600	43	NA	10	11	613000000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Pyrene	7800	160	NA	10	11	22100000	NA	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Tetrachloroethene	18600	695	NA	10	11	615000	37500	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Toluene	144	26	NA	10	11	31300000	128000	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Trichloroethene	1630	345	NA	10	11	19600	509000	ug/kg
IHSS 400-122	BV38-002	2081890.490	749050.500	Uranium, Total	57	1.6	3.04	10	11	2750	67.8	mg/kg
IHSS 400-122	*BV38-002*	*2081890.490*	*749050.500*	*Uranium-234*	*4.175*	*1.446*	*2.64*	*10*	*11*	*300*	*1800*	*pCi/g*
IHSS 400-122	BV38-002	2081890.490	749050.500	Uranium-238	4.175	1.446	1.49	10	11	351	1600	pCi/g
IHSS 400-122	BV38-002	2081890.490	749050.500	Xylene	1120	52.1	NA	10	11	2040000	NA	ug/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 400-122	BV38-003	2081887.616	749036.635	2-Methylnaphthalene	54	35	NA	12.5	17	20400000	NA	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Acenaphthene	110	34	NA	12.5	17	40800000	NA	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Anthracene	75	26	NA	12.5	17	204000000	NA	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Benzo(a)anthracene	95	27	NA	12.5	17	34900	800000	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Chrysene	120	31	NA	12.5	17	3490000	NA	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Dibenzofuran	73	40	NA	12.5	17	2950000	NA	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Fluoranthene	230	25	NA	12.5	17	27200000	NA	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Fluorene	89	38	NA	12.5	17	40800000	NA	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Nitrate	2.6	0.23	NA	12.5	17	1000000	NA	mg/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Phenol	44	39	NA	12.5	17	613000000	NA	ug/kg
IHSS 400-122	BV38-003	2081887.616	749036.635	Pyrene	240	150	NA	12.5	17	22100000	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	1,2-Dichloropropane	71.6	6.06	NA	12.5	15.5	345000	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Acenaphthene	84	36	NA	12.5	15.5	40800000	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Anthracene	100	28	NA	12.5	15.5	204000000	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Benzo(a)anthracene	220	29	NA	12.5	15.5	34900	800000	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Benzo(b)fluoranthene	170	34	NA	12.5	15.5	34900	1010000	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Benzo(k)fluoranthene	230	38	NA	12.5	15.5	349000	1010000	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Chrysene	270	33	NA	12.5	15.5	3490000	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Fluoranthene	490	27	NA	12.5	15.5	27200000	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Fluorene	65	40	NA	12.5	15.5	40800000	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Indeno(1,2,3-cd)pyrene	130	27	NA	12.5	15.5	34900	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Nitrate	4.3	0.24	NA	12.5	15.5	1000000	NA	mg/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Pyrene	560	160	NA	12.5	15.5	22100000	NA	ug/kg
IHSS 400-122	BV38-004	2081895.612	749034.349	Tetrachloroethene	14	6.06	NA	12.5	15.5	615000	37500	ug/kg
UBC-441	BV38-005	2081920.712	749115.398	Acetone	5.1	4.8	NA	0	0.5	102000000	211000	ug/kg
UBC-441	BV38-005	2081920.712	749115.398	Aluminum	19000	2.3	16902	0	0.5	228000	NA	mg/kg
UBC-441	BV38-005	2081920.712	749115.398	bis(2-Ethylhexyl)phthalate	120	76	NA	0	0.5	1970000	NA	ug/kg
UBC-441	BV38-005	2081920.712	749115.398	Butylbenzylphthalate	99	69	NA	0	0.5	147000000	NA	ug/kg
UBC-441	BV38-005	2081920.712	749115.398	Lithium	14	0.12	11.55	0	0.5	20400	NA	mg/kg
UBC-441	BV38-005	2081920.712	749115.398	Mercury	0.58	0.005	0.134	0	0.5	25200	NA	mg/kg
UBC-441	BV38-005	2081920.712	749115.398	Methylene chloride	0.95	0.84	NA	0	0.5	2530000	39500	ug/kg
UBC-441	BV38-005	2081920.712	749115.398	Nitrate	29	0.22	NA	0	0.5	1000000	NA	mg/kg
UBC-441	BV38-005	2081920.712	749115.398	Tin	3.2	0.34	2.9	0	0.5	613000	NA	mg/kg
UBC-441	BV38-005	2081920.712	749115.398	Arsenic	14	0.44	13.14	5	5	22.2	21.6	mg/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
UBC-441	BV38-005	2081920.712	749115.398	Benzo(a)anthracene	48	46	NA	5	5	34900	800000	ug/kg
UBC-441	BV38-005	2081920.712	749115.398	Chrysene	49	40	NA	5	5	3490000	NA	ug/kg
UBC-441	BV38-005	2081920.712	749115.398	Fluoranthene	130	46	NA	5	5	27200000	NA	ug/kg
UBC-441	**BV38-005**	**2081920.712**	**749115.398**	**Lead**	**38**	**0.21**	**24.97**	**5**	**5**	**1000**	**25.6**	**mg/kg**
UBC-441	BV38-005	2081920.712	749115.398	Pyrene	100	66	NA	5	5	22100000	NA	ug/kg
UBC-441	*BV38-005*	*2081920.712*	*749115.398*	*Uranium, Total*	*7.547*	*3.831*	*3.04*	*5*	*5*	*2750*	*67.8*	*mg/kg*
UBC-441	BV38-005	2081920.712	749115.398	Uranium-238	2.541	1.29	1.49	5	5	351	1600	pCi/g
UBC-441	BV38-006	2081889.571	749116.481	Aluminum	25000	2.3	16902	0	0.5	228000	NA	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Arsenic	11	0.41	10.09	0	0.5	22.2	21.6	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Beryllium	1.4	0.038	0.966	0	0.5	921	2.15	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Chromium	19	0.079	16.99	0	0.5	268	NA	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Chrysene	46	38	NA	0	0.5	3490000	NA	ug/kg
UBC-441	BV38-006	2081889.571	749116.481	Fluoranthene	100	43	NA	0	0.5	27200000	NA	ug/kg
UBC-441	BV38-006	2081889.571	749116.481	Iron	19000	1.8	18037	0	0.5	307000	NA	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Lithium	16	0.12	11.55	0	0.5	20400	NA	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Mercury	0.51	0.0028	0.134	0	0.5	25200	NA	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Nickel	20	0.2	14.91	0	0.5	20400	NA	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Nitrate	14	0.22	NA	0	0.5	1000000	NA	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Pyrene	100	62	NA	0	0.5	22100000	NA	ug/kg
UBC-441	BV38-006	2081889.571	749116.481	Tin	3	0.34	2.9	0	0.5	613000	NA	mg/kg
UBC-441	BV38-006	2081889.571	749116.481	Vanadium	52	0.15	45.59	0	0.5	7150	433	mg/kg
UBC-441	**BV38-006**	**2081889.571**	**749116.481**	**Lead**	**100**	**0.22**	**24.97**	**4.5**	**6.5**	**1000**	**25.6**	**mg/kg**
UBC-441	*BV38-006*	*2081889.571*	*749116.481*	*Uranium, Total*	*8.069*	*5.076*	*3.04*	*4.5*	*6.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BV38-006*	*2081889.571*	*749116.481*	*Uranium-234*	*2.717*	*1.709*	*2.64*	*4.5*	*6.5*	*300*	*1800*	*pCi/g*
UBC-441	BV38-006	2081889.571	749116.481	Uranium-238	2.717	1.709	1.49	4.5	6.5	351	1600	pCi/g
IHSS 000-121	BV38-007	2081868.115	749059.504	Acenaphthene	61	49	NA	0	0.5	40800000	NA	ug/kg
IHSS 000-121	BV38-007	2081868.115	749059.504	Benzo(a)anthracene	160	42	NA	0	0.5	34900	800000	ug/kg
IHSS 000-121	BV38-007	2081868.115	749059.504	Benzo(a)pyrene	150	56	NA	0	0.5	3490	25700	ug/kg
IHSS 000-121	BV38-007	2081868.115	749059.504	Benzo(b)fluoranthene	110	69	NA	0	0.5	34900	1010000	ug/kg
IHSS 000-121	BV38-007	2081868.115	749059.504	Benzo(k)fluoranthene	150	74	NA	0	0.5	349000	1010000	ug/kg
IHSS 000-121	BV38-007	2081868.115	749059.504	Chrysene	180	37	NA	0	0.5	3490000	NA	ug/kg
IHSS 000-121	BV38-007	2081868.115	749059.504	Fluoranthene	360	42	NA	0	0.5	27200000	NA	ug/kg
IHSS 000-121	**BV38-007**	**2081868.115**	**749059.504**	**Lead**	**37**	**0.27**	**54.62**	**0**	**0.5**	**1000**	**25.6**	**mg/kg**
IHSS 000-121	BV38-007	2081868.115	749059.504	Lithium	12	0.49	11.55	0	0.5	20400	NA	mg/kg
IHSS 000-121	BV38-007	2081868.115	749059.504	Methylene chloride	2	0.87	NA	0	0.5	2530000	39500	ug/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 000-121	BV38-007	2081868.115	749059.504	Pyrene	390	61	NA	0	0.5	22100000	NA	ug/kg
UBC-441	*BV38-008*	*2081888.626*	*749104.659*	*Uranium, Total*	*10.909*	*5.889*	*3.04*	*4.5*	*6.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BV38-008*	*2081888.626*	*749104.659*	*Uranium-234*	*3.673*	*1.980*	*2.64*	*4.5*	*6.5*	*300*	*1800*	*pCi/g*
UBC-441	BV38-008	2081888.626	749104.659	Uranium-235	0.223	0.147	0.12	4.5	6.5	8	1900	pCi/g
UBC-441	BV38-008	2081888.626	749104.659	Uranium-238	3.673	1.980	1.49	4.5	6.5	351	1600	pCi/g
IHSS 000-121	BV38-009	2081794.571	749066.169	Uranium-235	0.179	0.102	0.12	9.5	10.5	8	1900	pCi/g
IHSS 000-121	BV38-010	2081799.667	749057.609	Chromium	200	0.17	68.27	5	5.5	268	NA	mg/kg
IHSS 000-121	BV38-010	2081799.667	749057.609	Copper	810	0.052	38.21	5	5.5	40900	NA	mg/kg
IHSS 000-121	**BV38-010**	**2081799.667**	**749057.609**	**Lead**	**32**	**0.31**	**24.97**	**5**	**5.5**	**1000**	**25.6**	**mg/kg**
IHSS 000-121	BV38-010	2081799.667	749057.609	Mercury	6	0.079	1.52	5	5.5	25200	NA	mg/kg
IHSS 000-121	BV38-010	2081799.667	749057.609	Tetrachloroethene	6.81	5.55	NA	5	5.5	615000	37500	ug/kg
IHSS 000-121	BV38-010	2081799.667	749057.609	Uranium, Total	10	1.6	3.04	5	5.5	2750	67.8	mg/kg
IHSS 000-121	*BV38-010*	*2081799.667*	*749057.609*	*Uranium-234*	*4.706*	*1.51*	*2.64*	*5*	*5.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BV38-010	2081799.667	749057.609	Uranium-235	0.214	0.121	0.12	5	5.5	8	1900	pCi/g
IHSS 000-121	BV38-010	2081799.667	749057.609	Uranium-238	4.706	1.51	1.49	5	5.5	351	1600	pCi/g
IHSS 000-121	*BV38-010*	*2081799.667*	*749057.609*	*Uranium, Total*	*3.312*	*2.561*	*3.04*	*5*	*8*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	BV38-011	2081789.483	749038.061	Lead	25	0.28	24.97	6.5	8.5	1000	25.6	mg/kg
IHSS 000-121	BV38-011	2081789.483	749038.061	Tetrachloroethene	20.4	5.61	NA	6.5	8.5	615000	37500	ug/kg
IHSS 000-121	*BV38-011*	*2081789.483*	*749038.061*	*Uranium, Total*	*4.33*	*3.181*	*3.04*	*6.5*	*8.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	BV38-011	2081789.483	749038.061	Uranium-235	0.121	0.103	0.12	6.5	8.5	8	1900	pCi/g
UBC-441	**BV39-002**	**2081888.922**	**749185.072**	**Lead**	**55**	**0.21**	**24.97**	**2**	**2.5**	**1000**	**25.6**	**mg/kg**
UBC-441	BV39-002	2081888.922	749185.072	Nitrate	29	0.23	NA	2	2.5	1000000	NA	mg/kg
UBC-441	BV39-002	2081888.922	749185.072	Uranium, Total	44	0.61	3.04	2	2.5	2750	67.8	mg/kg
UBC-441	*BV39-002*	*2081888.922*	*749185.072*	*Uranium-234*	*4.154*	*1.525*	*2.64*	*2*	*2.5*	*300*	*1800*	*pCi/g*
UBC-441	BV39-002	2081888.922	749185.072	Uranium-235	0.170	0.128	0.12	2	2.5	8	1900	pCi/g
UBC-441	BV39-002	2081888.922	749185.072	Uranium-238	4.154	1.525	1.49	2	2.5	351	1600	pCi/g
UBC-441	BV39-003-01	2081888.650	749213.804	Aluminum	18000	2.3	16902	0	0.5	228000	NA	mg/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Benzo(a)anthracene	84	43	NA	0	0.5	34900	800000	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Benzo(a)pyrene	72	56	NA	0	0.5	3490	25700	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	bis(2-Ethylhexyl)phthalate	130	77	NA	0	0.5	1970000	NA	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Butylbenzylphthalate	84	71	NA	0	0.5	147000000	NA	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Chrysene	86	38	NA	0	0.5	3490000	NA	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Fluoranthene	250	43	NA	0	0.5	27200000	NA	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Lithium	12	0.12	11.55	0	0.5	20400	NA	mg/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
UBC-441	BV39-003-01	2081888.650	749213.804	Mercury	0.14	0.003	0.134	0	0.5	25200	NA	mg/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Naphthalene	50	46	NA	0	0.5	3090000	NA	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Nitrate	6	0.22	NA	0	0.5	1000000	NA	mg/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Pyrene	230	62	NA	0	0.5	22100000	NA	ug/kg
UBC-441	*BV39-003-01*	*2081888.650*	*749213.804*	*Uranium, Total*	*12.471*	*5.388*	*5.98*	*0*	*0.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BV39-003-01*	*2081888.650*	*749213.804*	*Uranium-234*	*4.199*	*1.814*	*2.253*	*0*	*0.5*	*300*	*1800*	*pCi/g*
UBC-441	BV39-003-01	2081888.650	749213.804	Uranium-238	4.199	1.814	2	0	0.5	351	1600	pCi/g
UBC-441	BV39-003-01	2081888.650	749213.804	Zinc	120	0.59	73.76	0	0.5	307000	NA	mg/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Benzo(a)anthracene	62	46	NA	2	2.3	34900	800000	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Chrysene	60	40	NA	2	2.3	3490000	NA	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Fluoranthene	120	46	NA	2	2.3	27200000	NA	ug/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Nitrate	6.1	0.24	NA	2	2.3	1000000	NA	mg/kg
UBC-441	BV39-003-01	2081888.650	749213.804	Pyrene	120	66	NA	2	2.3	22100000	NA	ug/kg
UBC-441	*BV39-003-01*	*2081888.650*	*749213.804*	*Uranium, Total*	*12.435*	*5.0625*	*3.04*	*2*	*2.3*	*2750*	*67.8*	*mg/kg*
UBC-441	*BV39-003-01*	*2081888.650*	*749213.804*	*Uranium-234*	*4.187*	*1.704*	*2.64*	*2*	*2.3*	*300*	*1800*	*pCi/g*
UBC-441	BV39-003-01	2081888.650	749213.804	Uranium-235	0.182	0.135	0.12	2	2.3	8	1900	pCi/g
UBC-441	BV39-003-01	2081888.650	749213.804	Uranium-238	4.187	1.704	1.49	2	2.3	351	1600	pCi/g
UBC-441	BV39-004	2081919.847	749183.925	Aluminum	21000	2.5	16902	0	0.5	228000	NA	mg/kg
UBC-441	BV39-004	2081919.847	749183.925	Beryllium	1	0.041	0.966	0	0.5	921	2.15	mg/kg
UBC-441	BV39-004	2081919.847	749183.925	Chromium	18	0.086	16.99	0	0.5	268	NA	mg/kg
UBC-441	BV39-004	2081919.847	749183.925	Lithium	12	0.13	11.55	0	0.5	20400	NA	mg/kg
UBC-441	BV39-004	2081919.847	749183.925	Nickel	15	0.22	14.91	0	0.5	20400	NA	mg/kg
UBC-441	BV39-004	2081919.847	749183.925	Nitrate	13	0.24	NA	0	0.5	1000000	NA	mg/kg
UBC-441	BV39-004	2081919.847	749183.925	Nitrate	43	0.23	NA	2	2.5	1000000	NA	mg/kg
UBC-441	*BV39-004*	*2081919.847*	*749183.925*	*Uranium, Total*	*10.906*	*5.402*	*3.04*	*2*	*2.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BV39-004*	*2081919.847*	*749183.925*	*Uranium-234*	*3.672*	*1.819*	*2.64*	*2*	*2.5*	*300*	*1800*	*pCi/g*
UBC-441	BV39-004	2081919.847	749183.925	Uranium-235	0.147	0.120	0.12	2	2.5	8	1900	pCi/g
UBC-441	BV39-004	2081919.847	749183.925	Uranium-238	3.672	1.819	1.49	2	2.5	351	1600	pCi/g
UBC-441	BV39-006	2081923.751	749166.755	2-Methylnaphthalene	820	41	NA	2.5	4.5	20400000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	bis(2-Ethylhexyl)phthalate	340	82	NA	2.5	4.5	1970000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	Butylbenzylphthalate	6000	75	NA	2.5	4.5	147000000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	Chrysene	52	40	NA	2.5	4.5	3490000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	Ethylbenzene	112	27.9	NA	2.5	4.5	4250000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	Fluoranthene	61	46	NA	2.5	4.5	27200000	NA	ug/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
UBC-441	BV39-006	2081923.751	749166.755	Naphthalene	3700	49	NA	2.5	4.5	3090000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	Nitrate	10	0.24	NA	2.5	4.5	1000000	NA	mg/kg
UBC-441	BV39-006	2081923.751	749166.755	Pyrene	71	66	NA	2.5	4.5	22100000	NA	ug/kg
UBC-441	*BV39-006*	*2081923.751*	*749166.755*	*Uranium, Total*	*12.275*	*5.150*	*3.04*	*2.5*	*4.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BV39-006*	*2081923.751*	*749166.755*	*Uranium-234*	*4.133*	*1.734*	*2.64*	*2.5*	*4.5*	*300*	*1800*	*pCi/g*
UBC-441	BV39-006	2081923.751	749166.755	Uranium-235	0.237	0.139	0.12	2.5	4.5	8	1900	pCi/g
UBC-441	BV39-006	2081923.751	749166.755	Uranium-238	4.133	1.734	1.49	2.5	4.5	351	1600	pCi/g
UBC-441	BV39-006	2081923.751	749166.755	Xylene	552	55.7	NA	2.5	4.5	2040000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	2-Methylnaphthalene	51	42	NA	4.5	6.5	20400000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	Butylbenzylphthalate	490	76	NA	4.5	6.5	147000000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	Naphthalene	190	50	NA	4.5	6.5	3090000	NA	ug/kg
UBC-441	BV39-006	2081923.751	749166.755	Nitrate	8.1	0.24	NA	4.5	6.5	1000000	NA	mg/kg
UBC-441	*BV39-006*	*2081923.751*	*749166.755*	*Uranium, Total*	*11.883*	*4.849*	*3.04*	*4.5*	*6.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BV39-006*	*2081923.751*	*749166.755*	*Uranium-234*	*4.001*	*1.633*	*2.64*	*4.5*	*6.5*	*300*	*1800*	*pCi/g*
UBC-441	BV39-006	2081923.751	749166.755	Uranium-235	0.156	0.134	0.12	4.5	6.5	8	1900	pCi/g
UBC-441	BV39-006	2081923.751	749166.755	Uranium-238	4.001	1.633	1.49	4.5	6.5	351	1600	pCi/g
UBC-441	BV39-007	2081889.329	749142.084	Nitrate	44	0.23	NA	6.2	6.5	1000000	NA	mg/kg
UBC-441	*BV39-007*	*2081889.329*	*749142.084*	*Uranium, Total*	*12.830*	*5.509*	*3.04*	*6.2*	*6.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BV39-007*	*2081889.329*	*749142.084*	*Uranium-234*	*4.32*	*1.855*	*2.64*	*6.2*	*6.5*	*300*	*1800*	*pCi/g*
UBC-441	BV39-007	2081889.329	749142.084	Uranium-235	0.167	0.150	0.12	6.2	6.5	8	1900	pCi/g
UBC-441	BV39-007	2081889.329	749142.084	Uranium-238	4.32	1.855	1.49	6.2	6.5	351	1600	pCi/g
IHSS 000-121	BW38-001	2081949.926	749033.560	Benzo(a)anthracene	49	42	NA	0	0.5	34900	800000	ug/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Benzo(a)pyrene	57	54	NA	0	0.5	3490	25700	ug/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Benzo(b)fluoranthene	72	67	NA	0	0.5	34900	1010000	ug/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Chrysene	120	36	NA	0	0.5	3490000	NA	ug/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Copper	74	0.045	18.06	0	0.5	40900	NA	mg/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Fluoranthene	120	42	NA	0	0.5	27200000	NA	ug/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Iron	21000	1.4	18037	0	0.5	307000	NA	mg/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Nitrate	2.6	0.21	NA	0	0.5	1000000	NA	mg/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Pyrene	81	60	NA	0	0.5	22100000	NA	ug/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Strontium	65	0.058	48.94	0	0.5	613000	NA	mg/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Toluene	6.59	5.11	NA	0	0.5	31300000	128000	ug/kg
IHSS 000-121	*BW38-001*	*2081949.926*	*749033.560*	*Uranium, Total*	*6.413*	*4.495*	*5.98*	*0*	*0.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	BW38-001	2081949.926	749033.560	Uranium-235	0.356	0.172	0.094	0	0.5	8	1900	pCi/g
IHSS 000-121	BW38-001	2081949.926	749033.560	Uranium-238	2.159	1.513	2	0	0.5	351	1600	pCi/g

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 000-121	BW38-001	2081949.926	749033.560	Vanadium	56	0.46	45.59	0	0.5	7150	433	mg/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Nitrate	3	0.22	NA	0.5	2.5	1000000	NA	mg/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	Plutonium-239/240	0.565	0.12	0.02	0.5	2.5	50	3800	pCi/g
IHSS 000-121	*BW38-001*	*2081949.926*	*749033.560*	*Uranium, Total*	*3.356*	*0.324*	*3.04*	*0.5*	*2.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	BW38-001	2081949.926	749033.560	Aluminum	41000	5.3	35373.17	2.5	4.5	228000	NA	mg/kg
IHSS 000-121	BW38-001	2081949.926	749033.560	bis(2-Ethylhexyl)phthalate	150	83	NA	2.5	4.5	1970000	NA	ug/kg
IHSS 000-121	*BW38-001*	*2081949.926*	*749033.560*	*Uranium, Total*	*13.956*	*5.146*	*3.04*	*2.5*	*4.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-001*	*2081949.926*	*749033.560*	*Uranium-234*	*4.699*	*1.732*	*2.64*	*2.5*	*4.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-001	2081949.926	749033.560	Uranium-238	4.699	1.732	1.49	2.5	4.5	351	1600	pCi/g
IHSS 000-121	BW38-001	2081949.926	749033.560	Nitrate	2.6	0.23	NA	4.5	6.5	1000000	NA	mg/kg
IHSS 000-121	*BW38-001*	*2081949.926*	*749033.560*	*Uranium, Total*	*9.703*	*4.969*	*3.04*	*4.5*	*6.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-001*	*2081949.926*	*749033.560*	*Uranium-234*	*3.267*	*1.673*	*2.64*	*4.5*	*6.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-001	2081949.926	749033.560	Uranium-238	3.267	1.673	1.49	4.5	6.5	351	1600	pCi/g
IHSS 000-121	BW38-001	2081949.926	749033.560	Nitrate	2.7	0.22	NA	6.5	8.5	1000000	NA	mg/kg
IHSS 000-121	*BW38-001*	*2081949.926*	*749033.560*	*Uranium, Total*	*12.780*	*4.589*	*3.04*	*6.5*	*8.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-001*	*2081949.926*	*749033.560*	*Uranium-234*	*4.303*	*1.545*	*2.64*	*6.5*	*8.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-001	2081949.926	749033.560	Uranium-238	4.303	1.545	1.49	6.5	8.5	351	1600	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(a)anthracene	70	41	NA	0	0.5	34900	800000	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(a)pyrene	80	53	NA	0	0.5	3490	25700	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(b)fluoranthene	73	66	NA	0	0.5	34900	1010000	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Chrysene	110	36	NA	0	0.5	3490000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Copper	32	0.044	18.06	0	0.5	40900	NA	mg/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Ethylbenzene	173	24.7	NA	0	0.5	4250000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Fluoranthene	170	41	NA	0	0.5	27200000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Indeno(1,2,3-cd)pyrene	75	46	NA	0	0.5	34900	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Nitrate	2.6	0.21	NA	0	0.5	1000000	NA	mg/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Pyrene	120	59	NA	0	0.5	22100000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Strontium	53	0.057	48.94	0	0.5	613000	NA	mg/kg
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium, Total*	*9.421*	*4.241*	*5.98*	*0*	*0.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium-234*	*3.172*	*1.428*	*2.253*	*0*	*0.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-235	0.175	0.125	0.094	0	0.5	8	1900	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-238	3.172	1.428	2	0	0.5	351	1600	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Vanadium	54	0.45	45.59	0	0.5	7150	433	mg/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Xylene	933	49.4	NA	0	0.5	2040000	NA	ug/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(a)anthracene	70	43	NA	0.5	2.5	34900	800000	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(a)pyrene	72	56	NA	0.5	2.5	3490	25700	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(b)fluoranthene	70	70	NA	0.5	2.5	34900	1010000	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Chrysene	67	38	NA	0.5	2.5	3490000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Fluoranthene	140	43	NA	0.5	2.5	27200000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Indeno(1,2,3-cd)pyrene	51	49	NA	0.5	2.5	34900	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Nitrate	3.7	0.23	NA	0.5	2.5	1000000	NA	mg/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Pyrene	140	62	NA	0.5	2.5	22100000	NA	ug/kg
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium, Total*	*15.616*	*5.391*	*3.04*	*0.5*	*2.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium-234*	*5.258*	*1.815*	*2.64*	*0.5*	*2.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-235	0.189	0.109	0.12	0.5	2.5	8	1900	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-238	5.258	1.815	1.49	0.5	2.5	351	1600	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Acenaphthene	330	48	NA	2.5	4.5	40800000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Anthracene	370	69	NA	2.5	4.5	204000000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(a)anthracene	710	41	NA	2.5	4.5	34900	800000	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(a)pyrene	700	54	NA	2.5	4.5	3490	25700	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(b)fluoranthene	740	67	NA	2.5	4.5	34900	1010000	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Benzo(k)fluoranthene	410	72	NA	2.5	4.5	349000	1010000	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Chrysene	790	36	NA	2.5	4.5	3490000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Dibenz(a,h)anthracene	110	66	NA	2.5	4.5	3490	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Dibenzofuran	97	53	NA	2.5	4.5	2950000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Fluoranthene	1800	41	NA	2.5	4.5	27200000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Fluorene	220	57	NA	2.5	4.5	40800000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Indeno(1,2,3-cd)pyrene	430	47	NA	2.5	4.5	34900	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Naphthalene	81	45	NA	2.5	4.5	3090000	NA	ug/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Nitrate	4.8	0.23	NA	2.5	4.5	1000000	NA	mg/kg
IHSS 000-121	BW38-002	2081984.363	749032.942	Pyrene	1800	59	NA	2.5	4.5	22100000	NA	ug/kg
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium, Total*	*6.460*	*4.675*	*3.04*	*2.5*	*4.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-238	2.175	1.574	1.49	2.5	4.5	351	1600	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Nitrate	3	0.22	NA	4.5	6.5	1000000	NA	mg/kg
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium, Total*	*9.219*	*4.977*	*3.04*	*4.5*	*6.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium-234*	*3.104*	*1.676*	*2.64*	*4.5*	*6.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-235	0.183	0.121	0.12	4.5	6.5	8	1900	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-238	3.104	1.676	1.49	4.5	6.5	351	1600	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Nitrate	3	0.22	NA	6.5	8.5	1000000	NA	mg/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium, Total*	*11.188*	*3.707*	*3.04*	*6.5*	*8.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-002*	*2081984.363*	*749032.942*	*Uranium-234*	*3.767*	*1.248*	*2.64*	*6.5*	*8.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-235	0.151	0.119	0.12	6.5	8.5	8	1900	pCi/g
IHSS 000-121	BW38-002	2081984.363	749032.942	Uranium-238	3.767	1.248	1.49	6.5	8.5	351	1600	pCi/g
UBC-441	BW38-003	2081939.807	749116.156	Arsenic	17.7	5	10.09	0	0.5	22.2	21.6	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Barium	600	98	141.26	0	0.5	26400	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Butylbenzylphthalate	450	67	NA	0	0.5	147000000	NA	ug/kg
UBC-441	BW38-003	2081939.807	749116.156	Chromium	38.1	20	16.99	0	0.5	268	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Copper	36.6	4	18.06	0	0.5	40900	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Iron	40500	2190	18037	0	0.5	307000	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Nickel	46.1	12	14.91	0	0.5	20400	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Nitrate	36	0.21	NA	0	0.5	1000000	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Strontium	157	20	48.94	0	0.5	613000	NA	mg/kg
UBC-441	*BW38-003*	*2081939.807*	*749116.156*	*Uranium, Total*	*8.539*	*4.702*	*5.98*	*0*	*0.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BW38-003*	*2081939.807*	*749116.156*	*Uranium-234*	*2.875*	*1.583*	*2.253*	*0*	*0.5*	*300*	*1800*	*pCi/g*
UBC-441	BW38-003	2081939.807	749116.156	Uranium-238	2.875	1.583	2	0	0.5	351	1600	pCi/g
UBC-441	BW38-003	2081939.807	749116.156	Vanadium	154	31	45.59	0	0.5	7150	433	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Barium	551	98	289.38	4	4	26400	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Copper	38.6	4	38.21	4	4	40900	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Iron	42700	2190	41046.52	4	4	307000	NA	mg/kg
UBC-441	**BW38-003**	**2081939.807**	**749116.156**	**Lead**	**942**	**7**	**24.97**	**4**	**4**	**1000**	**25.6**	**mg/kg**
UBC-441	BW38-003	2081939.807	749116.156	Nitrate	8.5	0.23	NA	4	4	1000000	NA	mg/kg
UBC-441	BW38-003	2081939.807	749116.156	Selenium	5.94	1	4.8	4	4	5110	NA	mg/kg
UBC-441	*BW38-003*	*2081939.807*	*749116.156*	*Uranium, Total*	*10.927*	*5.011*	*3.04*	*4*	*4*	*2750*	*67.8*	*mg/kg*
UBC-441	*BW38-003*	*2081939.807*	*749116.156*	*Uranium-234*	*3.679*	*1.687*	*2.64*	*4*	*4*	*300*	*1800*	*pCi/g*
UBC-441	BW38-003	2081939.807	749116.156	Uranium-235	0.187	0.141	0.12	4	4	8	1900	pCi/g
UBC-441	BW38-003	2081939.807	749116.156	Uranium-238	3.679	1.687	1.49	4	4	351	1600	pCi/g
UBC-441	BW38-003	2081939.807	749116.156	Vanadium	164	31	88.49	4	4	7150	433	mg/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Benzo(a)anthracene	67	41	NA	0	0.5	34900	800000	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Benzo(a)pyrene	63	54	NA	0	0.5	3490	25700	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Benzo(b)fluoranthene	85	67	NA	0	0.5	34900	1010000	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Chrysene	78	36	NA	0	0.5	3490000	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Fluoranthene	130	41	NA	0	0.5	27200000	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Pyrene	140	59	NA	0	0.5	22100000	NA	ug/kg
IHSS 000-121	*BW38-004*	*2082028.600*	*749033.521*	*Uranium, Total*	*10.098*	*4.410*	*5.98*	*0*	*0.5*	*2750*	*67.8*	*mg/kg*

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 000-121	*BW38-004*	*2082028.600*	*749033.521*	*Uranium-234*	*3.4*	*1.485*	*2.253*	*0*	*0.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-004	2082028.600	749033.521	Uranium-235	0.191	0.153	0.094	0	0.5	8	1900	pCi/g
IHSS 000-121	BW38-004	2082028.600	749033.521	Uranium-238	3.4	1.485	2	0	0.5	351	1600	pCi/g
IHSS 000-121	BW38-004	2082028.600	749033.521	Acenaphthene	130	49	NA	0.5	2.5	40800000	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Anthracene	160	71	NA	0.5	2.5	204000000	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Benzo(a)anthracene	360	43	NA	0.5	2.5	34900	800000	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Benzo(a)pyrene	370	56	NA	0.5	2.5	3490	25700	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Benzo(b)fluoranthene	470	69	NA	0.5	2.5	34900	1010000	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Benzo(k)fluoranthene	170	75	NA	0.5	2.5	349000	1010000	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Chrysene	420	37	NA	0.5	2.5	3490000	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Dibenz(a,h)anthracene	75	68	NA	0.5	2.5	3490	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Fluoranthene	930	43	NA	0.5	2.5	27200000	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Fluorene	94	59	NA	0.5	2.5	40800000	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Indeno(1,2,3-cd)pyrene	230	48	NA	0.5	2.5	34900	NA	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Pyrene	890	62	NA	0.5	2.5	22100000	NA	ug/kg
IHSS 000-121	*BW38-004*	*2082028.600*	*749033.521*	*Uranium, Total*	*11.622*	*4.655*	*3.04*	*0.5*	*2.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-004*	*2082028.600*	*749033.521*	*Uranium-234*	*3.913*	*1.567*	*2.64*	*0.5*	*2.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-004	2082028.600	749033.521	Uranium-235	0.197	0.140	0.12	0.5	2.5	8	1900	pCi/g
IHSS 000-121	BW38-004	2082028.600	749033.521	Uranium-238	3.913	1.567	1.49	0.5	2.5	351	1600	pCi/g
IHSS 000-121	*BW38-004*	*2082028.600*	*749033.521*	*Uranium, Total*	*12.017*	*4.140*	*3.04*	*2.5*	*4.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-004*	*2082028.600*	*749033.521*	*Uranium-234*	*4.046*	*1.394*	*2.64*	*2.5*	*4.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-004	2082028.600	749033.521	Uranium-235	0.203	0.109701	0.12	2.5	4.5	8	1900	pCi/g
IHSS 000-121	BW38-004	2082028.600	749033.521	Uranium-238	4.046	1.394	1.49	2.5	4.5	351	1600	pCi/g
IHSS 000-121	**BW38-004**	**2082028.600**	**749033.521**	**Arsenic**	**23**	**0.81**	**13.14**	**4.5**	**6.5**	**22.2**	**21.6**	**mg/kg**
IHSS 000-121	**BW38-004**	**2082028.600**	**749033.521**	**Beryllium**	**2.3**	**0.1**	**14.2**	**4.5**	**6.5**	**921**	**2.15**	**mg/kg**
IHSS 000-121	BW38-004	2082028.600	749033.521	Nitrate	2.8	0.22	NA	4.5	6.5	1000000	NA	mg/kg
IHSS 000-121	*BW38-004*	*2082028.600*	*749033.521*	*Uranium, Total*	*11.874*	*5.014*	*3.04*	*4.5*	*6.5*	*2750*	*67.8*	*mg/kg*
IHSS 000-121	*BW38-004*	*2082028.600*	*749033.521*	*Uranium-234*	*3.998*	*1.688*	*2.64*	*4.5*	*6.5*	*300*	*1800*	*pCi/g*
IHSS 000-121	BW38-004	2082028.600	749033.521	Uranium-235	0.238	0.152	0.12	4.5	6.5	8	1900	pCi/g
IHSS 000-121	BW38-004	2082028.600	749033.521	Uranium-238	3.998	1.688	1.49	4.5	6.5	351	1600	pCi/g
IHSS 000-121	BW38-004	2082028.600	749033.521	Methylene chloride	1.4	0.86	NA	6.5	8.5	2530000	39500	ug/kg
IHSS 000-121	BW38-004	2082028.600	749033.521	Nitrate	2.9	0.21	NA	6.5	8.5	1000000	NA	mg/kg
UBC-441	BW39-000	2081942.057	749230.471	2-Methylnaphthalene	280	41	NA	1	1	20400000	NA	ug/kg
UBC-441	BW39-000	2081942.057	749230.471	Arsenic	17.5	5	13.14	1	1	22.2	21.6	mg/kg
UBC-441	BW39-000	2081942.057	749230.471	Barium	515	98	289.38	1	1	26400	NA	mg/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
UBC-441	BW39-000	2081942.057	749230.471	bis(2-Ethylhexyl)phthalate	350	83	NA	1	1	1970000	NA	ug/kg
UBC-441	BW39-000	2081942.057	749230.471	Butylbenzylphthalate	1300	75	NA	1	1	147000000	NA	ug/kg
UBC-441	BW39-000	2081942.057	749230.471	Copper	44.1	4	38.21	1	1	40900	NA	mg/kg
UBC-441	BW39-000	2081942.057	749230.471	Fluoranthene	50	46	NA	1	1	27200000	NA	ug/kg
UBC-441	BW39-000	2081942.057	749230.471	Iron	41400	2190	41046.52	1	1	307000	NA	mg/kg
UBC-441	**BW39-000**	**2081942.057**	**749230.471**	**Lead**	**80.4**	**7**	**24.97**	**1**	**1**	**1000**	**25.6**	**mg/kg**
UBC-441	*BW39-000*	*2081942.057*	*749230.471*	*Uranium, Total*	*13.911*	*4.922*	*3.04*	*1*	*1*	*2750*	*67.8*	*mg/kg*
UBC-441	*BW39-000*	*2081942.057*	*749230.471*	*Uranium-234*	*4.684*	*1.657*	*2.64*	*1*	*1*	*300*	*1800*	*pCi/g*
UBC-441	BW39-000	2081942.057	749230.471	Uranium-235	0.296	0.262	0.12	1	1	8	1900	pCi/g
UBC-441	BW39-000	2081942.057	749230.471	Uranium-238	4.684	1.657	1.49	1	1	351	1600	pCi/g
UBC-441	BW39-000	2081942.057	749230.471	Vanadium	159	31	88.49	1	1	7150	433	mg/kg
UBC-441	BW39-000	2081942.057	749230.471	Chromium	140	0.086	68.27	4.5	6.5	268	NA	mg/kg
UBC-441	BW39-000	2081942.057	749230.471	Nickel	70	0.22	62.21	4.5	6.5	20400	NA	mg/kg
UBC-441	*BW39-000*	*2081942.057*	*749230.471*	*Uranium, Total*	*13.665*	*5.452*	*3.04*	*4.5*	*6.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BW39-000*	*2081942.057*	*749230.471*	*Uranium-234*	*4.601*	*1.836*	*2.64*	*4.5*	*6.5*	*300*	*1800*	*pCi/g*
UBC-441	BW39-000	2081942.057	749230.471	Uranium-235	0.269	0.144	0.12	4.5	6.5	8	1900	pCi/g
UBC-441	BW39-000	2081942.057	749230.471	Uranium-238	4.601	1.836	1.49	4.5	6.5	351	1600	pCi/g
UBC-441	BW39-001	2081941.424	749196.289	Arsenic	18.1	5	10.09	0	0.5	22.2	21.6	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Barium	546	98	141.26	0	0.5	26400	NA	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Chromium	44.2	20	16.99	0	0.5	268	NA	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Copper	60.3	4	18.06	0	0.5	40900	NA	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Iron	41900	2190	18037	0	0.5	307000	NA	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Nickel	55.2	12	14.91	0	0.5	20400	NA	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Nitrate	76	0.22	NA	0	0.5	1000000	NA	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Strontium	153	20	48.94	0	0.5	613000	NA	mg/kg
UBC-441	*BW39-001*	*2081941.424*	*749196.289*	*Uranium, Total*	*11.054*	*4.633*	*5.98*	*0*	*0.5*	*2750*	*67.8*	*mg/kg*
UBC-441	*BW39-001*	*2081941.424*	*749196.289*	*Uranium-234*	*3.722*	*1.560*	*2.253*	*0*	*0.5*	*300*	*1800*	*pCi/g*
UBC-441	BW39-001	2081941.424	749196.289	Uranium-235	0.199	0.119	0.094	0	0.5	8	1900	pCi/g
UBC-441	BW39-001	2081941.424	749196.289	Uranium-238	3.722	1.560	2	0	0.5	351	1600	pCi/g
UBC-441	BW39-001	2081941.424	749196.289	Vanadium	162	31	45.59	0	0.5	7150	433	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Arsenic	13.3	5	13.14	2	2	22.2	21.6	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Barium	556	98	289.38	2	2	26400	NA	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Copper	58.1	4	38.21	2	2	40900	NA	mg/kg
UBC-441	BW39-001	2081941.424	749196.289	Iron	41400	2190	41046.52	2	2	307000	NA	mg/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
UBC-441	BW39-001	2081941.424	749196.289	Nitrate	9.7	0.22	NA	2	2	1000000	NA	mg/kg
UBC-441	*BW39-001*	*2081941.424*	*749196.289*	*Uranium, Total*	*11.936*	*5.139*	*3.04*	*2*	*2*	*2750*	*67.8*	*mg/kg*
UBC-441	*BW39-001*	*2081941.424*	*749196.289*	*Uranium-234*	*4.019*	*1.730*	*2.64*	*2*	*2*	*300*	*1800*	*pCi/g*
UBC-441	BW39-001	2081941.424	749196.289	Uranium-235	0.179	0.141	0.12	2	2	8	1900	pCi/g
UBC-441	BW39-001	2081941.424	749196.289	Uranium-238	4.019	1.730	1.49	2	2	351	1600	pCi/g
UBC-441	BW39-001	2081941.424	749196.289	Vanadium	135	31	88.49	2	2	7150	433	mg/kg

Bold face type indicates WRW or ecological receptor AL exceedance.
Italic type indicates result derived by calculation based on other analyses.
Note: µg/kg usually appears as ug/kg

The soil with detected arsenic was not remediated because the concentration was in the range of background means plus two standard deviations historically seen at RFETS and, as a subsurface sample; it was eliminated from consideration by the SSRS process. Similarly, the benzo(a)pyrene detection was eliminated from consideration by the SSRS because it was located between 10 and 11 feet in depth.

One surface soil (0.0 to 0.5 ft in depth) lead concentration (37 mg/kg) at accelerated action location BV38-007 exceeded the ecological receptor AL of 25.6 mg/kg. This area has been backfilled with soil from the RFETS New (never used) Landfill area and rough graded. This contamination will be further evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and ecological risk assessment portion of the Sitewide CRA.

Concentrations of lead above the ecological receptor AL were detected at 7 accelerated action subsurface locations. The concentrations ranged from 32 to 942 mg/kg at depths from 1 to 11 feet (Figure 5 and Table 3). The maximum lead concentration was at location BW38-003 in a sample from 4 feet. (Both the start and end depths equal 4 feet.) The next highest lead detection was 100 mg/kg at location BV38-006 in a sample from 4.5 to 6.5 feet. Beryllium was detected above the ecological receptor AL at two locations: BV38-002 and BW38-004. In BV38-002, the concentration from 10 to 11 feet was 190 mg/kg. At BW38-004, the beryllium concentration was 2.3 mg/kg at 4.5 to 6.5 feet. The ecological receptor AL is 2.15 mg/kg. As mentioned above, arsenic at BW38-004 was also above the ecological receptor AL. The locations where these results were observed have been backfilled by soil from the RFETS New (never used) Landfill area. Contamination will be evaluated as part of the AAESE and ecological risk assessment portion of the Sitewide CRA.

The raw data, as of February 6, 2004, are provided on the enclosed compact disc.

2.5 SORs

RFCA sums of ratios (SORs) were calculated for the IHSS Group 400-8 sampling locations based on the accelerated action analytical data for the contaminants of concern (COCs). Radionuclide SORs included americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238 when analyses were greater than background means plus two standard deviations. Plutonium-239/240 activities were derived from americium-241 activities (i.e., plutonium-239/240 activity = americium-241 gamma spectroscopy activity x 5.7) where high-purity germanium (HPGe) detection was used for analysis. Table 4 presents the radionuclide SORs for surface and subsurface soil. All SORs for radionuclides in surface and subsurface soil were less than one.

Surface soil SORs for nonradionuclide COCs are shown in Table 5. Nonradionuclide SORs were calculated for all locations with analytical results greater than 10 percent of the WRW AL. Aluminum, arsenic, iron, manganese, and polyaromatic hydrocarbon compounds (PAHs) were not included in the nonradionuclide SORs. All nonradionuclide SORs for surface soil were less than one.

Table 4
RFCA SORs Based on Radionuclide Concentrations and WRW ALs

Location Code	Start Depth (ft)	End Depth (ft)	Surface Soil SOR	Subsurface Soil SOR
BV38-002	10	11	NA	0.026
BV38-005	5	5	NA	0.007
BV38-006	4.5	6.5	NA	0.017
BV38-008	4.5	6.5	NA	0.051
BV38-009	9.5	10.5	NA	0.022
BV38-010	5	5.5	NA	0.056
BV38-011	6.5	8.5	NA	0.015
BV38-012	2	2.5	NA	0.026
BV38-012	2.5	4.5	NA	0.022
BV38-013	2	2.5	NA	0.005
BV38-013	2.5	4.5	NA	0.046
BV39-002	2	2.5	NA	0.047
BV39-003-01	0	0.5	0.026	NA
BV39-003-01	2	2.3	NA	0.049
BV39-004	2	2.5	NA	0.041
BV39-006	2.5	4.5	NA	0.055
BV39-006	4.5	6.5	NA	0.044
BV39-007	6.2	6.5	NA	0.048
BW38-001	0	0.5	0.051	NA
BW38-001	0.5	2.5	NA	0.005
BW38-001	2.5	4.5	NA	0.029
BW38-001	4.5	6.5	NA	0.020
BW38-001	6.5	8.5	NA	0.027
BW38-002	0	0.5	0.042	NA
BW38-002	0.5	2.5	NA	0.056
BW38-002	2.5	4.5	NA	0.006
BW38-002	4.5	6.5	NA	0.042
BW38-002	6.5	8.5	NA	0.042
BW38-003	0	0.5	0.018	NA
BW38-003	4	4	NA	0.046
BW38-004	0	0.5	0.045	NA
BW38-004	0.5	2.5	NA	0.049
BW38-004	2.5	4.5	NA	0.050
BW38-004	4.5	6.5	NA	0.054
BW39-000	1	1	NA	0.066
BW39-000	4.5	6.5	NA	0.062
BW39-001	0	0.5	0.048	NA
BW39-001	2	2	NA	0.047

NA = No interval or radionuclides are less than background means plus two standard deviations

Table 5
RFCA Surface Soil SORs Based on Nonradionuclide Concentrations and WRW ALs

Location Code	Easting	Northing	Surface Soil SOR
BW38-003	2081939.81	749116.16	0.142
BW39-001	2081941.42	749196.29	0.165

3.0 ACCELERATED ACTION

Accelerated action objectives were developed and described in ER RSOP Notification #03-06 (DOE 2003b). ER RSOP remedial action objectives (RAOs) include the following:

- Provide a remedy consistent with the RFETS goal of protection of human health and the environment;
- Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and
- Minimize the spread of contaminants during implementation of accelerated actions.

The accelerated action remediation goals identified for IHSS Group 400-8 included the following:

- Remove the concrete slabs and caissons/footers within 3 feet of the final grade. Recycle in accordance with the RSOP for Recycling Concrete (DOE 2003c) or dispose at an appropriate facility.
- Flush and remove sanitary sewer and storm drains located within 3 feet of final grade. Remaining drains will be disrupted to prevent their operation and movement of groundwater. Remaining sanitary sewer lines will be checked for possible internal contamination, and results will be evaluated in consultation with the regulatory agencies.
- Remove Tanks T-2 and T-3 and associated drains and piping within 3 feet of the final grade in accordance with the RSOP for Facility Disposition (DOE 2000b) and RFCA Attachment 14 (DOE et al. 2003). Soil contaminant concentrations greater than RFCA soil WRW ALs for plutonium and americium by any leaks from OPWL within 3 feet of the ground surface will be removed to a depth of 3 feet.
- Remove soil with nonradionuclide or uranium contaminant concentrations greater than the RFCA WRW ALs to a depth of 6 inches. If soil contamination greater than the ALs extends below 6 inches in depth, perform an SSRS to evaluate the need for further accelerated action.
- Remove soil with plutonium-239/240 or americium-241 activities greater than the RFCA WRW ALs to a depth of 3 feet, or to less than the applicable AL, whichever comes first. If plutonium-239/240 or americium-241 activities are greater than 3 nanocuries per gram (nCi/g) between 3 and 6 feet, characterize and remediate pursuant to RFCA Attachment 5

(DOE et al. 2003). If plutonium-239/240 or americium-241 is present at activities greater than the RFCA WRW AL but less than 3 nCi/g below 3 feet, conduct an SSRS.

- Consult with the regulatory agencies if contaminant concentrations are greater than the ecological receptor ALs but lower than the WRW ALs.

- Collect confirmation samples in accordance with the IASAP (DOE 2001).

Accelerated action activities were conducted between April 7, 2003, and December 22, 2003. Work was started in early April 2003 but stopped at the end of May 2003 because of Site budget adjustments (refer to June 4, 2003, Regulatory Contact Record, Appendix A). Work was restarted on November 24, 2003 and completed on December 22, 2003. An additional day of sampling was required on January 28, 2004. Start and end dates of significant activities are listed in Table 6. Key components removed during the accelerated action and remaining components are shown on Figure 6. Photographs of site activities are provided in Appendix B.

Table 6
Dates of Accelerated Action Activities

Activity	Start Date	End Date	Duration
Characterization Sampling	April 7, 2003	December 22, 2003	42 Days*/**
Removal Activities	April 7, 2003	December 22, 2003	38 Days*
Backfill Excavations	December 18, 2003	December 22, 2003	3 Days
Reseed	Waiting for Building 443 and 4th Street removal		

*Does not include end of May to November 2003 hiatus. **Includes one day in January 2004.

3.1 Removal Activities

All accelerated action objectives were achieved. The removal activities are described in the following sections. Please refer to Figure 6.

3.1.1 Building Slab and Sump

The entire Building 441 slab was removed, including the north foundation slab and the south addition foundation slab. Also removed was a concrete-filled condensate return sump located under the southern third of the northern slab. All footer walls and caissons were completely removed. An excavator was the primary tool used to remove the slab, footer walls, and caissons. Two small areas of the north slab had fixed uranium contamination and were removed using a concrete saw. This contaminated concrete was packaged as low-level radioactive waste (LLW) (i.e., placed in two ST90 metal waste containers) and disposed of in an off-site landfill (Envirocare). The remainder of the north slab was disposed of at an off-site sanitary landfill, including two sections with asbestos-containing (nonfriable) floor tile mastic on the surface. The south addition slab was taken to the Building 850 concrete stockpile.

All of the footer wall and caisson concrete was disposed of at an off-site sanitary landfill. Dust suppression was used during the removal of all concrete.

FIGURE 6

IHSS Group 400-8
Slabs, Tanks, Process Lines, and Other Items Removed

2081750 2081800 2081850 2081900 2081950 2082000 2082050

749250 749200 749150 749100 749050 749000

Water main cut and capped. Cut piping leading into foundation removed.

Sanitary manhole removed to approximately 4 ft below ground surface. Lower 2 ft of manhole and attached piping remain in place. These had previously been filled with grout. Connection to building also removed.

UBC 441

Sidewalk west of northern and southern slabs and asphalt between sidewalk and building was removed.

North slab, all footings, and columns of Building 441 and underlying OPWL removed.

South slab, all footings, and columns of Building 441 and underlying OPWL removed.

Asphalt pads east of southern slab was removed.

Manhole and piping extending approximately 2 ft. east and west removed. Ends of remaining OPWL in ground grouted.

OPWL-P3

OPWL-P3 in place between former 441 foundation wall (east) and manhole (west).

IHSS 400-122

Tanks T-2 and T-3 Removed

T-2

T-3

T441A

OPWL-P4 removed from Tank T-3 to a point about 12 feet east. In place end of OPWL P4 grouted.

Manhole and OPWL pipe to west (2 ft.) removed. OPWL pipe to north only extends 10 ft., completely removed. Ends of OPWL remaining in ground grouted.

OPWL-P4

KEY

- IHSS 400-122
- UBC 441
- Tank
- Building - standing
- Building - demolished
- Asphalt - removed
- Feature not found
- Manhole - removed
- Manhole - remaining
- Paved road
- Original Process Waste Line (OPWL) - removed
- Original Process Waste Line (OPWL) - remaining
- Water main remaining
- Water main removed
- Sewer remaining
- Sewer removed
- Storm drain

N W E S

10 0 10 20 30 40 50 Feet

Scale = 1:350

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS

Date: 03/22/04

File: W/Projects/Fy2003/400-8 /Closeout Report/400-8_Closeout.apr

3.1.2 Tanks T-2 and T-3

Tanks T-2 and T-3 were completely removed. Prior to removal of Tank T-2, residual liquid, sludge, limestone, and other material in the tank chambers (e.g., the wet well and limestone bed) were sampled, removed, and packaged as low-level mixed waste (LLMW). Liquids removed from both the wet well and limestone bed were transported to the 891-treatment facility. The holding tank had been previously filled with foam. The various chambers were cleaned and rinsed. Related rinse water was stabilized with absorbent and packaged for disposal as LLMW. Concrete samples were collected from the wet well and limestone bed. Based on the sampling results, all of the Tank T-2 and T-3 concrete was disposed of as LLMW. The condensate sump was disposed of as sanitary waste.

Other items removed, excluding the process waste lines discussed in the next section, include the following:

- A concrete vault slab and loading dock stairway were disposed of as sanitary waste.
- The concrete support foundation for a former aboveground tank located east of Tanks T-2 and T-3 was shipped to an off-site sanitary landfill.
- Electrical conduit and water lines (there was one short section of water main line at the north side of the foundation) were shipped to an off-site sanitary landfill.
- Asphalt east of the foundation slab and tank (approximately 3,600 ft^2) was shipped to an off-site sanitary landfill.
- Concrete sidewalk west of the foundation slab was shipped to an off-site sanitary landfill.

3.1.3 Waste Lines, and Foundation and Storm Drains

OPWL under the Building 441 slab and exiting the southern addition (from Tanks T-2 and T-3) were exposed, tapped and drained, and removed. Most of the lines were cast iron. The extent of the line removals is shown on Figure 6. Line P3, west of Tank T-2, between Buildings 123 and 441 remains largely intact as it passes under Fourth Street. It was removed in the vicinity of the northern manhole west of Building 441 (as discussed below) and east of the foundation wall of 441 up to Tank T-2. Line P4, east of Building 441, remains intact from 12 feet east of Tank T-3. The section of P4 that was removed was cut, bagged, and removed between 3 and 12 feet east of Tank T-3. The 3-foot section of P4 attached to Tank T-3 was removed with the tank.

Two OPWL manholes west of Fourth Street were removed and the asphalt around the manholes. Clay pipelines associated with the manholes, extending approximately 2 feet east and west of the northern manhole and 2 feet west and ten feet north of the southern manhole were removed. The two manholes were not connected as implied on engineering drawings. The ends of pipelines remaining in the ground were filled with grout approximately 2 feet into the line. All segments removed were bagged and placed in LLW containers. The concrete base of each OPWL manhole was packaged and shipped off site as LLMW. The upper portions were packaged and

shipped off site as LLW. The asphalt around the manholes was shipped off site as sanitary waste.

Sanitary lines under the slab were previously flushed during building demolition. Metal pipe wrapped with asbestos-containing insulation was also removed during building demolition. These lines were bagged and shipped off site as sanitary waste. Sanitary Manhole 26, located on the northern side of the project site, was removed to 4 feet below ground surface (bgs). The remaining base of the manhole with its pipe connections had been grouted and isolated when Building 441 was demolished. The 1- to 2- foot-high section of the manhole remaining in the ground was buried as the excavation was backfilled to the existing grade. The fragments of the manhole that were removed were shipped to an off-site sanitary landfill.

No foundation drains were found associated with Building 441. No storm drains were removed. A storm drain off the southeastern corner of the building was left in place and will be removed during demolition of Building 443.

3.1.4 Soil Remediation and Site Reclamation

The lead contaminated surface soil from existing sampling locations SS000695 and SS000795 was removed (Figure 3). This consisted of a section 4 feet by 4 feet by 2 feet deep, located approximately 8 feet south of Tanks T-2 and T-3. Based on existing characterization data, the soil had lead concentrations greater than the WRW AL. No additional soil was removed based on confirmation results. Post-remediation conditions are discussed in Section 9.0, and sampling locations considered NLR are discussed in Section 12.0.

Excavations associated with removal of the tanks, waste lines, footer walls, caissons, and other items were backfilled. The area was then graded and contoured for drainage (refer to Section 11.0). Nine end-dump loads, approximately 144 cubic yards, of backfill soil were brought to the project site from the New Landfill area.

4.0 CONFIRMATION SAMPLING

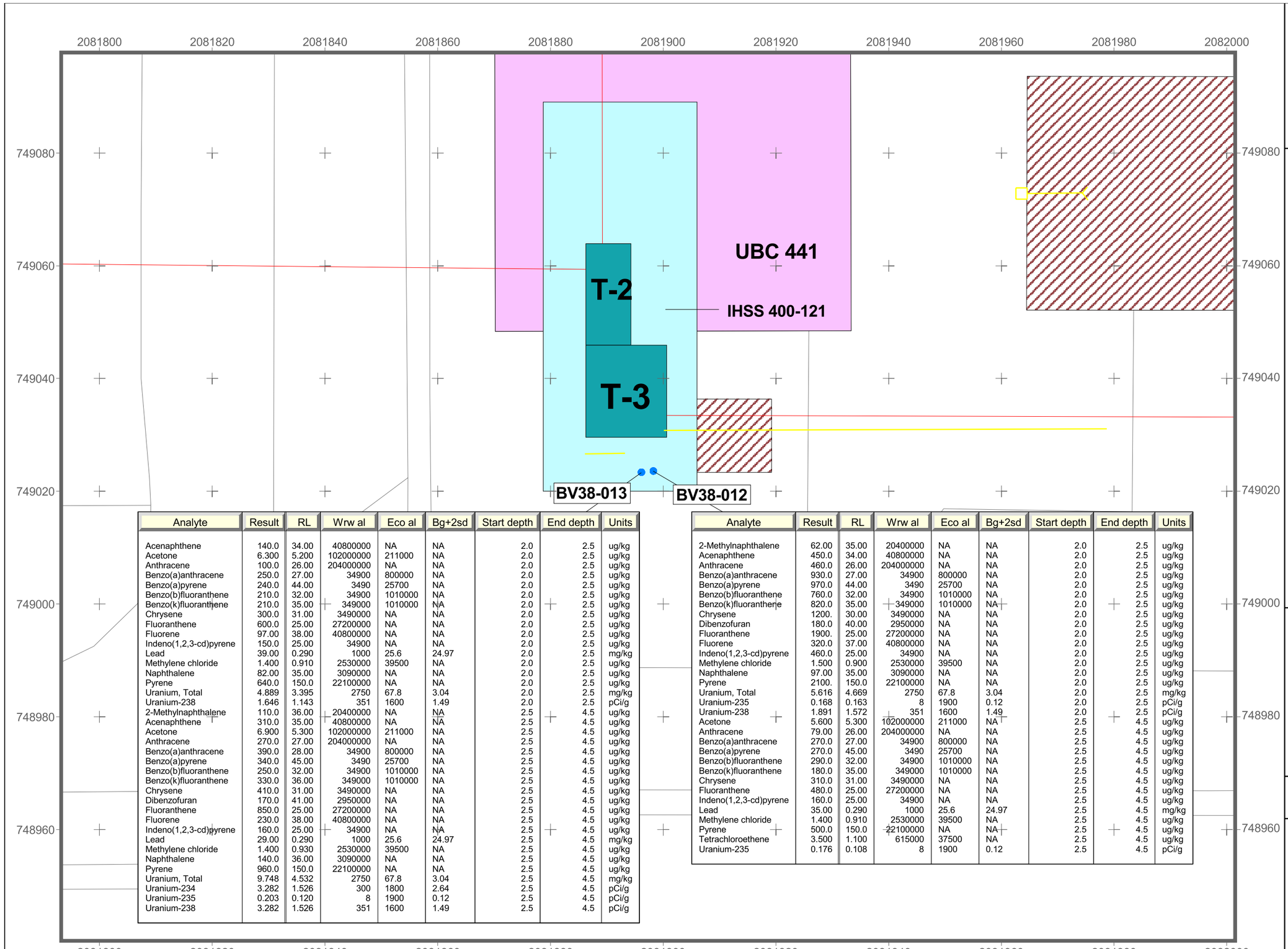
Confirmation sampling was conducted after removal of the two existing lead exceedances (Sections 2.4 and 3.1.4). Two intervals from locations BV38-012 and BV38-013 were sampled after the surface soil was removed (Figure 7 and Table 7). Results indicate residual lead concentrations in subsurface soil were less than the WRW AL (1,000 mg/kg) and only slightly greater (29-39 mg/kg) than the ecological receptor AL (25.6 mg/kg) in three of four intervals sampled. The AAESE and ecological risk assessment portion of the Sitewide CRA will address this residual lead contamination. Additional sampling within this IHSS Group was for characterization.

5.0 RCRA UNIT CLOSURE

IHSS Group 400-8 contained no waste management units subject to Resource Conservation and Recovery Act (RCRA) closure regulation.

FIGURE 7

IHSS Group 400-8 Confirmation Sampling and Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits



Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
Acenaphthene	140.0	34.00	40800000	NA	NA	2.0	2.5	ug/kg
Acetone	6.300	5.200	102000000	211000	NA	2.0	2.5	ug/kg
Anthracene	100.0	26.00	204000000	NA	NA	2.0	2.5	ug/kg
Benzo(a)anthracene	250.0	27.00	34900	800000	NA	2.0	2.5	ug/kg
Benzo(a)pyrene	240.0	44.00	3490	25700	NA	2.0	2.5	ug/kg
Benzo(b)fluoranthene	210.0	32.00	34900	1010000	NA	2.0	2.5	ug/kg
Benzo(k)fluoranthene	210.0	35.00	349000	1010000	NA	2.0	2.5	ug/kg
Chrysene	300.0	31.00	3490000	NA	NA	2.0	2.5	ug/kg
Fluoranthene	600.0	25.00	27200000	NA	NA	2.0	2.5	ug/kg
Fluorene	97.00	38.00	40800000	NA	NA	2.0	2.5	ug/kg
Indeno(1,2,3-cd)pyrene	150.0	25.00	34900	NA	NA	2.0	2.5	ug/kg
Lead	39.00	0.290	1000	25.6	24.97	2.0	2.5	mg/kg
Methylene chloride	1.400	0.910	2530000	39500	NA	2.0	2.5	ug/kg
Naphthalene	82.00	35.00	3090000	NA	NA	2.0	2.5	ug/kg
Pyrene	640.0	150.0	22100000	NA	NA	2.0	2.5	ug/kg
Uranium, Total	4.889	3.395	2750	67.8	3.04	2.0	2.5	mg/kg
Uranium-238	1.646	1.143	351	1600	1.49	2.0	2.5	pCi/g
2-Methylnaphthalene	110.0	36.00	20400000	NA	NA	2.5	4.5	ug/kg
Acenaphthene	310.0	35.00	40800000	NA	NA	2.5	4.5	ug/kg
Acetone	6.900	5.300	102000000	211000	NA	2.5	4.5	ug/kg
Anthracene	270.0	27.00	204000000	NA	NA	2.5	4.5	ug/kg
Benzo(a)anthracene	390.0	28.00	34900	800000	NA	2.5	4.5	ug/kg
Benzo(a)pyrene	340.0	45.00	3490	25700	NA	2.5	4.5	ug/kg
Benzo(b)fluoranthene	250.0	32.00	34900	1010000	NA	2.5	4.5	ug/kg
Benzo(k)fluoranthene	330.0	36.00	349000	1010000	NA	2.5	4.5	ug/kg
Chrysene	410.0	31.00	3490000	NA	NA	2.5	4.5	ug/kg
Dibenzofuran	170.0	41.00	2950000	NA	NA	2.5	4.5	ug/kg
Fluoranthene	850.0	25.00	27200000	NA	NA	2.5	4.5	ug/kg
Fluorene	230.0	38.00	40800000	NA	NA	2.5	4.5	ug/kg
Indeno(1,2,3-cd)pyrene	160.0	25.00	34900	NA	NA	2.5	4.5	ug/kg
Lead	29.00	0.290	1000	25.6	24.97	2.5	4.5	mg/kg
Methylene chloride	1.400	0.930	2530000	39500	NA	2.5	4.5	ug/kg
Naphthalene	140.0	36.00	3090000	NA	NA	2.5	4.5	ug/kg
Pyrene	960.0	150.0	22100000	NA	NA	2.5	4.5	ug/kg
Uranium, Total	9.748	4.532	2750	67.8	3.04	2.5	4.5	mg/kg
Uranium-234	3.282	1.526	300	1800	2.64	2.5	4.5	pCi/g
Uranium-235	0.203	0.120	8	1900	0.12	2.5	4.5	pCi/g
Uranium-238	3.282	1.526	351	1600	1.49	2.5	4.5	pCi/g

Analyte	Result	RL	Wrw al	Eco al	Bg+2sd	Start depth	End depth	Units
2-Methylnaphthalene	62.00	35.00	20400000	NA	NA	2.0	2.5	ug/kg
Acenaphthene	450.0	34.00	40800000	NA	NA	2.0	2.5	ug/kg
Anthracene	460.0	26.00	204000000	NA	NA	2.0	2.5	ug/kg
Benzo(a)anthracene	930.0	27.00	34900	800000	NA	2.0	2.5	ug/kg
Benzo(a)pyrene	970.0	44.00	3490	25700	NA	2.0	2.5	ug/kg
Benzo(b)fluoranthene	760.0	32.00	34900	1010000	NA	2.0	2.5	ug/kg
Benzo(k)fluoranthene	820.0	35.00	349000	1010000	NA	2.0	2.5	ug/kg
Chrysene	1200.	30.00	3490000	NA	NA	2.0	2.5	ug/kg
Dibenzofuran	180.0	40.00	2950000	NA	NA	2.0	2.5	ug/kg
Fluoranthene	1900.	25.00	27200000	NA	NA	2.0	2.5	ug/kg
Fluorene	320.0	37.00	40800000	NA	NA	2.0	2.5	ug/kg
Indeno(1,2,3-cd)pyrene	460.0	25.00	34900	NA	NA	2.0	2.5	ug/kg
Methylene chloride	1.500	0.900	2530000	39500	NA	2.0	2.5	ug/kg
Naphthalene	97.00	35.00	3090000	NA	NA	2.0	2.5	ug/kg
Pyrene	2100.	150.0	22100000	NA	NA	2.0	2.5	ug/kg
Uranium, Total	5.616	4.669	2750	67.8	3.04	2.0	2.5	mg/kg
Uranium-235	0.168	0.163	8	1900	0.12	2.0	2.5	pCi/g
Uranium-238	1.891	1.572	351	1600	1.49	2.0	2.5	pCi/g
Acetone	5.600	5.300	102000000	211000	NA	2.5	4.5	ug/kg
Anthracene	79.00	26.00	204000000	NA	NA	2.5	4.5	ug/kg
Benzo(a)anthracene	270.0	27.00	34900	800000	NA	2.5	4.5	ug/kg
Benzo(a)pyrene	270.0	45.00	3490	25700	NA	2.5	4.5	ug/kg
Benzo(b)fluoranthene	290.0	32.00	34900	1010000	NA	2.5	4.5	ug/kg
Benzo(k)fluoranthene	180.0	35.00	349000	1010000	NA	2.5	4.5	ug/kg
Chrysene	310.0	31.00	3490000	NA	NA	2.5	4.5	ug/kg
Fluoranthene	480.0	25.00	27200000	NA	NA	2.5	4.5	ug/kg
Indeno(1,2,3-cd)pyrene	160.0	25.00	34900	NA	NA	2.5	4.5	ug/kg
Lead	35.00	0.290	1000	25.6	24.97	2.5	4.5	mg/kg
Methylene chloride	1.400	0.910	2530000	39500	NA	2.5	4.5	ug/kg
Pyrene	500.0	150.0	22100000	NA	NA	2.5	4.5	ug/kg
Tetrachloroethene	3.500	1.100	615000	37500	NA	2.5	4.5	ug/kg
Uranium-235	0.176	0.108	8	1900	0.12	2.5	4.5	pCi/g

KEY

- Greater than Ecological Receptor Action Level
- IHSS 400-122
- UBC 441
- Tanks
- Building - standing
- Building - demolished
- Paved road
- Original Process Waste Line (OPWL)
- Storm drain

N
W E
S

5 0 5 10 15 20 25 Feet

Scale = 1:200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER-HILL COMPANY

Prepared by: RADMS

Date: 03/22/04

File: W/Projects/Fy2003/400-8/Closeout Report/400-8_closeout.apr

Table 7
IHSS Group 400-8 Confirmation Samples

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 400-122	BV38-012	2081898.225	749023.566	2-Methylnaphthalene	62	35	NA	2	2.5	20400000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Acenaphthene	450	34	NA	2	2.5	40800000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Anthracene	460	26	NA	2	2.5	204000000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Benzo(a)anthracene	930	27	NA	2	2.5	34900	800000	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Benzo(a)pyrene	970	44	NA	2	2.5	3490	25700	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Benzo(b)fluoranthene	760	32	NA	2	2.5	34900	1010000	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Benzo(k)fluoranthene	820	35	NA	2	2.5	349000	1010000	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Chrysene	1200	30	NA	2	2.5	3490000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Dibenzofuran	180	40	NA	2	2.5	2950000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Fluoranthene	1900	25	NA	2	2.5	27200000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Fluorene	320	37	NA	2	2.5	40800000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Indeno(1,2,3-cd)pyrene	460	25	NA	2	2.5	34900	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Methylene chloride	1.5	0.9	NA	2	2.5	2530000	39500	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Naphthalene	97	35	NA	2	2.5	3090000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Pyrene	2100	150	NA	2	2.5	22100000	NA	ug/kg
IHSS 400-122	*BV38-012*	*2081898.225*	*749023.566*	*Uranium, Total*	*5.616*	*4.669*	*3.04*	*2*	*2.5*	*2750*	*67.8*	*mg/kg*
IHSS 400-122	BV38-012	2081898.225	749023.566	Uranium-235	0.168	0.163	0.12	2	2.5	8	1900	pCi/g
IHSS 400-122	BV38-012	2081898.225	749023.566	Uranium-238	1.891	1.572	1.49	2	2.5	351	1600	pCi/g
IHSS 400-122	BV38-012	2081898.225	749023.566	Acetone	5.6	5.3	NA	2.5	4.5	102000000	211000	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Anthracene	79	26	NA	2.5	4.5	204000000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Benzo(a)anthracene	270	27	NA	2.5	4.5	34900	800000	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Benzo(a)pyrene	270	45	NA	2.5	4.5	3490	25700	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Benzo(b)fluoranthene	290	32	NA	2.5	4.5	34900	1010000	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Benzo(k)fluoranthene	180	35	NA	2.5	4.5	349000	1010000	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Chrysene	310	31	NA	2.5	4.5	3490000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Fluoranthene	480	25	NA	2.5	4.5	27200000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Indeno(1,2,3-cd)pyrene	160	25	NA	2.5	4.5	34900	NA	ug/kg
IHSS 400-122	**BV38-012**	**2081898.225**	**749023.566**	**Lead**	**35**	**0.29**	**24.97**	**2.5**	**4.5**	**1000**	**25.6**	**mg/kg**
IHSS 400-122	BV38-012	2081898.225	749023.566	Methylene chloride	1.4	0.91	NA	2.5	4.5	2530000	39500	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Pyrene	500	150	NA	2.5	4.5	22100000	NA	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Tetrachloroethene	3.5	1.1	NA	2.5	4.5	615000	37500	ug/kg
IHSS 400-122	BV38-012	2081898.225	749023.566	Uranium-235	0.176	0.108	0.12	2.5	4.5	8	1900	pCi/g
IHSS 400-122	BV38-013	2081896.136	749023.311	Acenaphthene	140	34	NA	2	2.5	40800000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Acetone	6.3	5.2	NA	2	2.5	102000000	211000	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Anthracene	100	26	NA	2	2.5	204000000	NA	ug/kg

IHSS/PAC/ UBC Site	Location	Actual Easting	Actual Northing	Analyte	Result	Reporting Limit	Background Mean + 2 SD	Start Depth (ft)	End Depth (ft)	WRW AL	Ecological Receptor AL	Units
IHSS 400-122	BV38-013	2081896.136	749023.311	Benzo(a)anthracene	250	27	NA	2	2.5	34900	800000	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Benzo(a)pyrene	240	44	NA	2	2.5	3490	25700	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Benzo(b)fluoranthene	210	32	NA	2	2.5	34900	1010000	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Benzo(k)fluoranthene	210	35	NA	2	2.5	349000	1010000	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Chrysene	300	31	NA	2	2.5	3490000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Fluoranthene	600	25	NA	2	2.5	27200000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Fluorene	97	38	NA	2	2.5	40800000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Indeno(1,2,3-cd)pyrene	150	25	NA	2	2.5	34900	NA	ug/kg
IHSS 400-122	**BV38-013**	**2081896.136**	**749023.311**	**Lead**	**39**	**0.29**	**24.97**	**2**	**2.5**	**1000**	**25.6**	**mg/kg**
IHSS 400-122	BV38-013	2081896.136	749023.311	Methylene chloride	1.4	0.91	NA	2	2.5	2530000	39500	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Naphthalene	82	35	NA	2	2.5	3090000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Pyrene	640	150	NA	2	2.5	22100000	NA	ug/kg
IHSS 400-122	*BV38-013*	*2081896.136*	*749023.311*	*Uranium, Total*	*4.889*	*3.395*	*3.04*	*2*	*2.5*	*2750*	*67.8*	*mg/kg*
IHSS 400-122	*BV38-013*	*2081896.136*	*749023.311*	*Uranium-238*	*1.646*	*1.143*	*1.49*	*2*	*2.5*	*351*	*1600*	*pCi/g*
IHSS 400-122	BV38-013	2081896.136	749023.311	2-Methylnaphthalene	110	36	NA	2.5	4.5	20400000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Acenaphthene	310	35	NA	2.5	4.5	40800000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Acetone	6.9	5.3	NA	2.5	4.5	102000000	211000	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Anthracene	270	27	NA	2.5	4.5	204000000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Benzo(a)anthracene	390	28	NA	2.5	4.5	34900	800000	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Benzo(a)pyrene	340	45	NA	2.5	4.5	3490	25700	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Benzo(b)fluoranthene	250	32	NA	2.5	4.5	34900	1010000	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Benzo(k)fluoranthene	330	36	NA	2.5	4.5	349000	1010000	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Chrysene	410	31	NA	2.5	4.5	3490000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Dibenzofuran	170	41	NA	2.5	4.5	2950000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Fluoranthene	850	25	NA	2.5	4.5	27200000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Fluorene	230	38	NA	2.5	4.5	40800000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Indeno(1,2,3-cd)pyrene	160	25	NA	2.5	4.5	34900	NA	ug/kg
IHSS 400-122	**BV38-013**	**2081896.136**	**749023.311**	**Lead**	**29**	**0.29**	**24.97**	**2.5**	**4.5**	**1000**	**25.6**	**mg/kg**
IHSS 400-122	BV38-013	2081896.136	749023.311	Methylene chloride	1.4	0.93	NA	2.5	4.5	2530000	39500	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Naphthalene	140	36	NA	2.5	4.5	3090000	NA	ug/kg
IHSS 400-122	BV38-013	2081896.136	749023.311	Pyrene	960	150	NA	2.5	4.5	22100000	NA	ug/kg
IHSS 400-122	*BV38-013*	*2081896.136*	*749023.311*	*Uranium, Total*	*9.748*	*4.532*	*3.04*	*2.5*	*4.5*	*2750*	*67.8*	*mg/kg*
IHSS 400-122	*BV38-013*	*2081896.136*	*749023.311*	*Uranium-234*	*3.282*	*1.526*	*2.64*	*2.5*	*4.5*	*300*	*1800*	*pCi/g*
IHSS 400-122	BV38-013	2081896.136	749023.311	Uranium-235	0.203	0.120	0.12	2.5	4.5	8	1900	pCi/g
IHSS 400-122	BV38-013	2081896.136	749023.311	Uranium-238	3.282	1.526	1.49	2.5	4.5	351	1600	pCi/g

Bold face type indicates WRW or ecological receptor AL exceedance.
Italic type indicates result derived by calculation based on other analyses.
Note: µg/kg usually appears as ug/kg

6.0 SSRS

The SSRS follows the steps identified on Figure 3 in Attachment 5 of the RFCA Modification (DOE et al. 2003).

Screen 1 – Are the COC concentrations below RFCA Table 3 ALs for the WRW?

No. As shown in Tables 3 and 7, all COC concentrations are below the WRW ALs, except for one subsurface soil arsenic location and one subsurface soil benzo(a)pyrene location. The arsenic concentration was 23 mg/kg at location BW38-004 in the interval from 4.5 to 6.5 feet in depth; the WRW AL is 22.2 mg/kg. The detected concentration is within the background range observed at RFETS. The benzo(a)pyrene concentration at BV38-002, between 10 and 11 feet in depth, was 3,700 µg/kg; the WRW AL is 3,490 µg/kg.

Screen 2 – Is there a potential for subsurface soil to become surface soil (landslides and erosion areas identified on Figure 1 of the RFCA Modification)?

No. IHSS Group 400-8 is not located in an area susceptible to landslides or high erosion (RFCA Attachment 5, Figure 1; DOE et al. 2003).

Screen 3 – Does subsurface soil contamination for radionuclides exceed criteria defined in RFCA Section 5.3 and Attachment 14?

No. As shown in Tables 3 and 7, radionuclide concentrations are well below soil WRW ALs.

Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause an exceedance of surface water standards?

Contaminant migration via erosion and groundwater are two possible pathways whereby surface water could become contaminated from IHSS Group 400-8. Runoff from IHSS Group 400-8 flows into the Central Avenue Ditch and through gauging stations GS-38 and GS-10 (DOE 2002b). GS-38 receives flow from the southwestern portion of the IA, including IA Areas 100, 400, and 600. GS-10 is a RFCA surface water Point of Evaluation (POE). Exceedances of surface water ALs have been detected at GS-10; however, this station receives water from a large part of the IA, and, therefore, surface water quality at GS-10 cannot be attributable to any single IHSS Group.

IHSS Group 400-8 is within the IA Plume, however, groundwater around IHSS Group 400-8 is not monitored. Soil analytical results indicate that VOCs are present in concentrations less than ALs at depth. The potential exists that groundwater could be affected by VOCs in soil at this IHSS Group. Wells to the west, including 10298, 10398, 10498, and 10598, monitor the Building 123 area. Recent results indicate upgradient well 10498 contains tetrachloroethene at a concentration that exceeds the Tier II groundwater AL. Results for the other wells mentioned above exhibit no concentrations exceeding Tier II ALs for groundwater (DOE 2003d).

Screen 5 – Are COC concentrations below RFCA Table 3 ALs for ecological receptors (DOE et al. 2003)?

Subsurface concentrations of lead above the ecological receptor AL were detected at 7 accelerated action and 2 confirmation locations (Figures 5 and 7). These subsurface concentrations ranged from 29 to 942 mg/kg at depths from 1 to 11 feet. The maximum lead concentration was at location BW38-003 at a depth of 4 feet. The next highest lead detection was 100 mg/kg at location BV38-006 (4.5 to 6.5 feet in depth).

Beryllium was detected above the ecological receptor AL at two accelerated action locations: BV38-002 and BW38-004. In BV38-002, the concentration from 10 to 11 feet in depth was 190 mg/kg. At BW38-004, the beryllium concentration was 2.3 mg/kg at 4.5 to 6.5 feet in depth. The ecological receptor AL is 2.15 mg/kg. The arsenic concentration at BW38-004, discussed in Screen 1 (above), was also above the ecological receptor AL (21.6 mg/kg). During site regrading the locations where these results were observed were backfilled with soil from the RFETS New (never used) Landfill area. Ecological receptor AL exceedances will be evaluated as part of the AAESE and ecological risk assessment portion of the Sitewide CRA.

7.0 STEWARDSHIP ANALYSIS

The IHSS Group 400-8 stewardship analysis was conducted through ongoing consultation with the regulatory agencies. Frequent informal project updates, e-mails, and telephone and personal contact occurred throughout the project. Documentation associated with these contacts is provided in Appendix A.

7.1 Current Site Conditions

As discussed in Section 3.1, accelerated actions at IHSS Group 400-8 consisted of excavation of two slabs, foundation walls and caissons, two manholes, asphalt, one sump, two tanks, drain lines, and lead-contaminated soil. Based on the accelerated action, the following conditions exist at IHSS Group 400-8:

- Potential sources of contamination that existed in IHSS Group 400-8 (the slabs, manholes, asphalt, sump, tanks, and drain lines) were removed.

- Surface and subsurface soil with concentrations greater than background means plus two standard deviations or RLs is present throughout the IHSS Group area.

- Contaminant concentrations are less than RFCA WRW ALs, except for one elevated arsenic concentration at location BW38-004 (between 4.5 and 6.5 feet in depth) and one benzo(a)pyrene concentration at BV38-002 (between 10 and 11 feet in depth). The arsenic concentration was 23.0 mg/kg, and the WRW AL is 22.2 mg/kg. The detected arsenic concentration is within the range of background concentrations historically observed at the Site. The benzo(a)pyrene concentration was 3,700 μg/kg, and the WRW AL is 3,490 μg/kg.

- Lead concentrations in soil were greater than the ecological receptor AL (25.6 mg/kg) at 1 surface and 9 subsurface locations. Location BV38-007 has a surface lead concentration of 37 mg/kg; the background mean plus two standard deviations is 54.62 mg/kg. Subsurface

lead ranged from 29 mg/kg (BV38-013, 2.5 to 4.5 feet in depth) to 942 mg/kg (BW38-003, 4 feet in depth) where the background means plus two standard deviations is 24.97 mg/kg. The beryllium ecological receptor AL (2.15 mg/kg) was exceeded at BV38-002 (190 mg/kg, 10 to 11 feet in depth) and BW38-004 (2.3 mg/kg, 4.5 to 6.5 feet in depth) where the background mean plus two standard deviations is 14.2 mg/kg.

- Nine end-dump loads, approximately 144 cubic yards, of backfill soil were brought to the project site from the New (never used) Landfill area. The IHSS Group 400-8 area was then rough graded. Final grading and revegetation of the IHSS Group 400-8 site will be performed after removal of Building 443 (to the east) and Fourth Street (to the west).

7.2 Near-Term Management Recommendations

Because residual contaminant concentrations are low and potential sources have been mitigated, or were found not to have existed, no specific near-term management techniques are required. Potential contaminant sources and pathways have been removed. Contaminant concentrations in soil remaining at IHSS Group 400-8 do not trigger any further accelerated action. Near-term recommendations include the following:

- Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process.
- Access will be restricted to minimize disturbance to newly revegetated areas.
- Site access, security controls, and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls.

7.3 Long-Term Stewardship Recommendations

Based on remaining environmental conditions at IHSS Group 400-8, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements. These requirements may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include the following:

- Prohibitions on construction of buildings in the IA;
- Restrictions on excavation or other soil disturbance; and
- Prohibitions on groundwater pumping in the area of IHSS Group 400-8.

No specific engineered controls or environmental monitoring are recommended as a result of the conditions remaining at IHSS Group 400-8. Likewise, no specific institutional or physical controls are recommended as a result of the conditions remaining at this IHSS Group.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR). The specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy.

IHSS Group 400-8 will be evaluated as part of the AAESE and Sitewide CRA. The CRA is part of the RCRA Facilities Investigation/Remedial Investigation and Corrective Measures Study/Feasibility Study (RI/FS) that will be conducted for the Site. The need for and extent of any more general, long-term stewardship activities will also be evaluated in the RI/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the Corrective Action Decision/Record of Decision (CAD/ROD), any post-closure Colorado Hazardous Waste Act (CHWA) permit that may be required, and any post-RFCA agreement.

8.0 DEVIATIONS FROM THE ER RSOP

Removal methods and objectives did not deviate from ER RSOP Notification #03-06 (DOE 2003b).

9.0 POST-REMEDIATION CONDITIONS

The Building 441 slab, foundation walls, footing caissons and columns, the sidewalk to the west, and asphalt pad to the east were removed. Also removed were a sump pump, process drain lines, two process drain manholes, sanitary drain lines, a sanitary manhole, water lines, electrical conduit, and two tanks (Section 3.1). No storm drains were removed. Sampling results from the soil beneath the items removed indicate that all contaminant concentrations are less than RFCA WRW ALs except for one elevated arsenic concentration at location BW38-004 (between 4.5 and 6.5 feet in depth) and one benzo(a)pyrene concentration at BV38-002 (between 10 and 11 feet in depth) (Figure 5). The arsenic concentration was 23 mg/kg, and the WRW AL is 22.2 mg/kg. The detected arsenic concentration is within the range of background concentrations historically observed at the Site. The benzo(a)pyrene concentration was 3,700 μg/kg, and the WRW AL is 3,490 μg/kg.

Concentrations of lead above the ecological receptor AL were detected at 1 surface (BV38-007, 37 mg/kg) and 9 subsurface locations (Figures 4, 5, and 7). The subsurface concentrations ranged from 29 to 942 mg/kg at depths from 1 to 11 feet in depth. The maximum subsurface lead concentration was at location BW38-003 at a depth of 4 feet. The next highest lead detection was 100 mg/kg at location BV38-006 at 4.5 to 6.5 feet in depth. Beryllium was detected above the ecological receptor AL at two locations: BV38-002 and BW38-004 (Figure 5). In BV38-002, the concentration from 10 to 11 feet in depth was 190 mg/kg. At BW38-004, the beryllium concentration result was 2.3 mg/kg from 4.5 to 6.5 feet in depth. The beryllium ecological receptor AL is 2.15 mg/kg. The arsenic concentration at BW38-004, discussed in the preceding paragraph, was also above the ecological receptor AL (21.6 mg/kg). The locations where these results were observed have been backfilled with soil from the RFETS New (never used) Landfill area. Ecological receptor AL exceedances will be evaluated as part of the AAESE and ecological risk assessment portion of the Sitewide CRA.

Residual analyte concentrations from surface soil are shown on Figures 4. Residual subsurface analyte concentrations around the IHSSs and UBC are shown on Figures 5 and 7. Because of

soil removal south of Tank T-3 existing characterization locations SS000695 and SS000795 are NLR.

Surface and subsurface soil SORs for radionuclides are less than one. All SORs for nonradionuclides in surface soil are also less than one.

10.0 WASTE MANAGEMENT

Waste from the IHSS Group 400-8 accelerated action consisted of concrete, cast iron pipe from process waste lines, clay pipe sanitary lines, and asphalt. One excavator bucket (32 cubic feet) of lead-contaminated soil was also removed. Most of the concrete from the northern foundation slab, including a relatively small amount with asbestos-containing floor tile mastic and the condensate sump pump, was shipped off site to a sanitary landfill. Concrete from the southern addition was taken to the Building 850 stockpile to be recycled. Two small, contaminated sections from the northern foundation slab were shipped off site as LLW in ST90 containers. Concrete waste from Tanks T-2 and T-3 was placed in intermodal containers and managed as LLMW. The limestone removed from Tank T-2 was placed in IP-1 containers and managed as LLMW. The tank sludge was also managed as LLMW. OPWL segments were cut up, bagged, and also placed in LLW containers. The concrete base of both OPWL manholes was packaged and shipped off site as LLMW. The upper portions were packaged and shipped off site as LLW. The nonprocess lines, concrete from around the lines, conduit, and asphalt were also shipped to an off-site sanitary landfill, including the metal pipe wrapped with asbestos-containing insulation. The excavated lead contaminated soil was packaged in an IP-1 container and managed as LLMW.

Three wastewater streams were generated during the accelerated action. Excavation water (approximately 12,000 gallons) was collected and stored in polyvinyl storage tanks. Based on sampling results, this wastewater was discharged to the Site sanitary sewer system. Water pumped from Tanks T-2 and T-3 (approximately 6,200 gallons) was stored in polyvinyl tanks, and then shipped via tanker truck to the Building 891 treatment facility. Water used to clean and rinse the tanks was also collected and shipped to Building 891.

The various wastes generated during the accelerated action are listed in Table 8, which includes volumes by waste type.

11.0 SITE RECLAMATION

Approximately 144 cubic yards of backfill soil was brought to the project site and spread over the area. The area was subsequently rough-graded. Reseeding will be delayed until the removal of Building 443 and Fourth Street have been completed so that the whole area can be graded and seeded as a unit. Reseeding is tentatively scheduled for FY05.

Table 8
Waste Volumes and Analytical Results

Container Number	Extended Number	Container Type	Volume	Waste Type	Gross Weight (lb)	Status	IDC	Waste Codes	Date shipped	Notes
X31880	044100022	BF1	90 ft^3	LLMW	3460	Full	5001	N/A	9/10/03	closed and sealed
X31874	044100024	BF1	90 ft^3	LLMW	3380	Full	5001	N/A	9/10/03	closed and sealed
X31875	044100023	BF1	90 ft^3	LLMW	4800	Full	5001	N/A	9/10/03	mercury/open IH
B04999	044100019	BF1	90 ft^3	LLMW	4500	Full	5001	N/A	9/10/03	closed and sealed
X31878	090300905	BF1	37 ft^3	LLW	4424	Full	374	7-4-0	Anticipated ship date 2/26/04	closed and sealed
X31873	044100020	BF1	50 ft^3	LLMW	2915	Full	5001	27-A-8	Anticipated ship date 2/26/04	closed and sealed
X31876	044100018	BF1	17 ft^3	LLW	2420	Full	5001	12-0-01	Anticipated ship date 2/26/04	closed and sealed
X31877	044100017	BF1	90 ft^3	LLMW	3380	Full		N/A	9/10/03	concrete
X08023	044100027	D05	0.66 ft^3	LLMW	Not Available	Not Available	320		holding	elemental mercury
DD1074	044100050	DRO	1.337 ft^3	LLMW	Not Available	need weight	324	27-A-11	holding	mercury dirt in bags
Sanitary	N/A	concrete	385 yd^3	NON	Not applicable	Completed	N/A	N/A	N/A	N/A
Sanitary	N/A	asphalt	35 yd^3	NON	Not applicable	Completed	N/A	N/A	N/A	N/A
Recycle	N/A	N/A	70 yd^3	RCY	Not applicable	Completed	N/A	N/A	N/A	N/A
B07133	044100035	IP-1	37 ft^3	LLMW	4332	WI done	0324	27-A-11	Anticipated ship date 2/26/04	limestone/sludge
B07134	044100036	IP-1	42 ft^3	LLMW	4861	WI done	0324	27-A-11	Anticipated ship date 2/26/05	limestone/sludge
B07135	044100044	IP-1	25 ft^3	LLMW	2192	WI done	0299	26-0-01	Anticipated ship date 2/26/06	sludge only
B07236	044100037	IP-1	55 ft^3	LLMW	6153	WI done	0324	27-A-11	Anticipated ship date 2/26/07	limestone/sludge
B07237	044100046	IP-1	54 ft^3	LLMW	3902	WI done	0299	26-0-01	Anticipated ship date 2/26/08	sludge only
B07238	044100045	IP-1	39 ft^3	LLMW	3004	WI done	0299	26-0-01	Anticipated ship date 2/26/09	sludge only
B07478	044100047	IP-1	47 ft^3	LLMW	3490	WI done	0299	26-0-01	Anticipated ship date 2/26/10	sludge only
B07479	044100048	IP-1	41 ft^3	LLMW	3112	Not Available	0299	26-0-01	Anticipated ship date 2/26/11	sludge only
B07482	044100038	IP-1	41 ft^3	LLMW	4786	WI done	0324	27-A-11	Anticipated ship date 2/26/12	limestone/sludge
B07483	044100039	IP-1	13.5 ft^3	LLMW	1632	WI done	0324	27-A-11	Anticipated ship date 2/26/13	limestone/sludge
B07480	044100049	IP-1	31 ft^3	LLMW	3801	WI done	324	27-A-05	Anticipated ship date 2/26/14	dirt w/lead
L03209	044100028	IM	215 ft^3	LLMW	28980	Not Available	324	27-4-06	Anticipated ship date 2/26/15	concrete

Container Number	Extended Number	Container Type	Volume	Waste Type	Gross Weight (lb)	Status	IDC	Waste Codes	Date shipped	Notes
L03210	044100029	IM	205 ft^3	LLMW	27940	Not Available	324	27-4-06	Anticipated ship date 2/26/16	concrete
L03111	044100030	IM	271 ft^3	LLMW	34640	Not Available	324	27-4-06	Anticipated ship date 2/26/17	concrete
L03112	044100031	IM	321 ft^3	LLMW	39620	Not Available	324	27-4-06	Anticipated ship date 2/26/18	concrete
L03113	044100032	IM	235 ft^3	LLMW	31000	Not Available	324	27-4-06	Anticipated ship date 2/26/19	concrete
L03114	044100033	IM	297 ft^3	LLMW	37240	Not Available	324	27-4-06	Anticipated ship date 2/26/20	concrete
L03115	044100034	IM	116 ft^3	LLMW	19080	Not Available	324	27-4-06	Anticipated ship date 2/26/21	concrete
L03116	044100040	IM	314 ft^3	LLMW	38900	Not Available	324	27-4-06	Anticipated ship date 2/26/22	concrete
L03117	044100041	IM	217 ft^3	LLMW	29200	Not Available	324	27-4-06	Anticipated ship date 2/26/23	concrete
L03118	044100042	IM	267 ft^3	LLMW	34200	Not Available	324	27-4-06	Anticipated ship date 2/26/24	concrete
L03119	044100043	IM	209 ft^3	LLMW	28380	Not Available	324	27-4-06	Anticipated ship date 2/26/25	concrete

IM = intermodal = 5x7x20 ft metal box
IP-1 = 4x4x7 ft metal box
DRO = 5 gallon drum
D05 = 55 gallon drum
BF1 = 4x4x7 ft metal box
LLMW = low-level mixed waste
LLW = low-level waste
ft^3 = cubic feet
yd^3 = cubic yards
lb = pounds
NON = nonradioactive
RCY = recycled nonradioactive

12.0 NO LONGER REPRESENTATIVE SAMPLING LOCATIONS

Two surface sampling locations are considered No Longer Representative (NLR) (Table 9). These locations are shown on Figure 3. Surface and subsurface soil associated with these locations contained lead (Section 2.3) and was removed (Sections 2.4 and 3.1.4). Therefore, data from the sampling locations are not representative. The other existing surface and subsurface locations at IHSS Group 400-8 (Figure 3) were disturbed by demolition and decommissioning activities, but no soil was removed. Because of the disturbances existing analytical data for these locations may not represent current soil conditions.

Table 9
NLR Sampling Locations

Location	Easting	Northing	Type
SS000695	2081896.09	749023.33	Surface
SS000795	2081898.21	749023.57	Surface

13.0 DQA

DQOs for this project are described in the IASAP (DOE 2001). All project DQOs were achieved based on the following:

- Regulatory agency-approved sampling program design (IASAP Addendum # IA-03-01 [DOE 2002a]), modified, due to field conditions, in accordance with the IASAP (DOE 2001);
- Collection of samples in accordance with the sampling design; and
- Results of the DQA, as described in the following sections.

13.1 DQA Process

The DQA process ensures that the type, quantity, and quality of environmental data used in decision making are defensible, and is based on the following guidance and requirements:

- U.S. Environmental Protection Agency (EPA), 1994a, Guidance for the Data Quality Objective Process, QA/G-4;
- EPA, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis, QA/G-9; and
- U.S. Department of Energy (DOE), 1999, Quality Assurance, Order 414.1A.

Verification and validation (V&V) of the data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions; uncertainty within the decisions; and quality criteria required for the data, specifically

precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines:

- EPA, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012;
- EPA, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013;
- Kaiser-Hill Company, L.L.C. (K-H) V&V Guidelines:

  General Guidelines for Data Verification and Validation, DA-GR01-v2, 2002a,
  V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, 2002b,
  V&V Guidelines for Volatile Organics, DA-SS01-v3, 2002c,
  V&V Guidelines for Semivolatile Organics, DA-SS02-v3, 2002d, and
  V&V Guidelines for Metals, DA-SS05-v3, 2002e; and
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

This Closeout Report will be submitted to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) AR for permanent storage 30 days after being provided to CDPHE and/or EPA.

13.2 V&V of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSDs);

- Laboratory control samples (LCSs);
- Field duplicate measurements;
- Chemical yield (radiochemistry);
- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively); and
- Sample analysis and preparation methods.

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (that is, within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation "flags" or qualifiers to individual records.

Raw hard-copy data (for example, individual analytical data packages) are currently filed by report identification number (RIN) and are maintained by K-H Analytical Services Division (ASD). Older hard-copies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS Soil Water Database (SWD).

Both real and QC data sets addressed in this report are included on the enclosed compact disc in Microsoft ACCESS 2000 format.

13.2.1 Accuracy

The following measures of accuracy were considered:

- LCS evaluation;
- Surrogate evaluation;
- Field blank evaluation;
- Sample MS evaluation.

Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA COCs where the results could impact project decisions. Particular attention is paid to those values near ALs when QC results could indicate unacceptable levels of uncertainty for decision-making purposes.

LCS Evaluation

The frequency of LCS measurements was adequate relative to each laboratory batch as shown in Table 10. LCS results that were outside of tolerances were reviewed to determine whether a potential bias might be indicated. LCS recoveries are not indicative of matrix effects because they are not prepared using site samples. LCS results do indicate whether the laboratory may be introducing a bias in the results. Recoveries reported above the upper limit may indicate the

actual sample results are less than reported. Because this is environmentally conservative, no further action is needed.

The analytes with unacceptable low recoveries were evaluated. If the maximum sample result divided by the lowest LCS recovery for that analyte is less than the WRW AL, no further action is taken because any indicated bias is not great enough to correct a false low sample result to one above the AL. The maximum sample results for arsenic and benzo(a)pyrene failed the criteria; however, concentrations of both analytes constitute WRW AL exceedances. LCS recoveries for other analytes did not impact project decisions. Any qualifications of individual results due to LCS performance exceeding upper or lower tolerance limits are also captured in the V&V flags, described in Section 13.2.3.

Surrogate Evaluation

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 11. Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project. Surrogates are added to every sample, and therefore, surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential matrix effects. Surrogate recoveries reported above 100 percent may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed. Therefore, only the lowest recoveries were evaluated. If the maximum sample result divided by the lowest surrogate recovery is less than the WRW AL for that method, no further action is taken because any indicated bias is not great enough to correct a false low sample result to one above the AL. Except for benzo(a)pyrene all other analytes passed this criteria. The maximum benzo(a)pyrene concentration is recognized as a WRW AL exceedance.

Table 10
LCS Evaluation

CAS No.	Analyte	Minimum % REC	Maximum %REC	Unit	Number of Analyses	Number of Batches	Test Method
7429-90-5	Aluminum	88	106	%REC	15	15	SW-846 6010
7440-36-0	Antimony	88	99	%REC	15	15	SW-846 6010
7440-38-2	Arsenic	89	101	%REC	15	15	SW-846 6010
7440-39-3	Barium	91	106	%REC	15	15	SW-846 6010
7440-41-7	Beryllium	92	106	%REC	15	15	SW-846 6010
7440-43-9	Cadmium	87	103	%REC	15	15	SW-846 6010
7440-47-3	Chromium	89	105	%REC	15	15	SW-846 6010
7440-48-4	Cobalt	88	102	%REC	15	15	SW-846 6010
7440-50-8	Copper	89	103	%REC	15	15	SW-846 6010
7439-89-6	Iron	93	106	%REC	15	15	SW-846 6010
7439-92-1	Lead	89	104	%REC	15	15	SW-846 6010
7439-93-2	Lithium	90	107	%REC	15	15	SW-846 6010
7439-96-5	Manganese	89	103	%REC	15	15	SW-846 6010
7439-97-6	Mercury	90	103	%REC	14	14	SW-846 6010
7439-98-7	Molybdenum	85	99	%REC	15	15	SW-846 6010

CAS No.	Analyte	Minimum % REC	Maximum %REC	Unit	Number of Analyses	Number of Batches	Test Method
7440-02-0	Nickel	88	102	%REC	15	15	SW-846 6010
7782-49-2	Selenium	86	104	%REC	15	15	SW-846 6010
7440-22-4	Silver	89	100	%REC	15	15	SW-846 6010
7440-24-6	Strontium	91	104	%REC	15	15	SW-846 6010
7440-31-5	Tin	87	96	%REC	15	15	SW-846 6010
11-09-7	Uranium, Total	94	108	%REC	15	15	SW-846 6010
7440-62-2	Vanadium	89	105	%REC	15	15	SW-846 6010
7440-66-6	Zinc	86	102	%REC	15	15	SW-846 6010
12674-11-2	Aroclor-1016	81	97	%REC	3	3	SW-846 8082
11096-82-5	Aroclor-1260	80	100	%REC	3	3	SW-846 8082
71-55-6	1,1,1-Trichloroethane	84.06	117	%REC	25	23	SW-846 8260
79-34-5	1,1,2,2-Tetrachloroethane	69	111.7	%REC	25	23	SW-846 8260
79-00-5	1,1,2-Trichloroethane	75	106.6	%REC	25	23	SW-846 8260
75-34-3	1,1-Dichloroethane	83	110.8	%REC	25	23	SW-846 8260
75-35-4	1,1-Dichloroethene	74	120.5	%REC	25	23	SW-846 8260
120-82-1	1,2,4-Trichlorobenzene	86	116.7	%REC	25	23	SW-846 8260
95-50-1	1,2-Dichlorobenzene	85	107.1	%REC	25	23	SW-846 8260
107-06-2	1,2-Dichloroethane	79.52	114.1	%REC	25	23	SW-846 8260
78-87-5	1,2-Dichloropropane	79	105.8	%REC	25	23	SW-846 8260
106-46-7	1,4-Dichlorobenzene	86	105.9	%REC	25	23	SW-846 8260
78-93-3	2-Butanone	50.13	124.1	%REC	25	23	SW-846 8260
108-10-1	4-Methyl-2-pentanone	73	123.4	%REC	25	23	SW-846 8260
67-64-1	Acetone	37.17	104.2	%REC	25	23	SW-846 8260
71-43-2	Benzene	79	111.9	%REC	25	23	SW-846 8260
75-27-4	Bromodichloromethane	84.08	111.9	%REC	25	23	SW-846 8260
75-25-2	Bromoform	83	122.2	%REC	25	23	SW-846 8260
74-83-9	Bromomethane	63.43	129.5	%REC	25	23	SW-846 8260
75-15-0	Carbon Disulfide	67	147.6	%REC	25	23	SW-846 8260
56-23-5	Carbon Tetrachloride	81.47	124	%REC	25	23	SW-846 8260
108-90-7	Chlorobenzene	83	125.9	%REC	25	23	SW-846 8260
75-00-3	Chloroethane	68.99	197.6	%REC	25	23	SW-846 8260
67-66-3	Chloroform	83.68	108	%REC	25	23	SW-846 8260
74-87-3	Chloromethane	45.99	199.4	%REC	25	23	SW-846 8260
10061-01-5	cis-1,3-Dichloropropene	79.61	107	%REC	25	23	SW-846 8260
124-48-1	Dibromochloromethane	86	119.3	%REC	25	23	SW-846 8260
100-41-4	Ethylbenzene	81	110.4	%REC	25	23	SW-846 8260
87-68-3	Hexachlorobutadiene	80.44	115.7	%REC	25	23	SW-846 8260
75-09-2	Methylene chloride	76	135.5	%REC	25	23	SW-846 8260
91-20-3	Naphthalene	79	129.9	%REC	25	23	SW-846 8260
100-42-5	Styrene	80	113	%REC	25	23	SW-846 8260
127-18-4	Tetrachloroethene	82.71	110.9	%REC	25	23	SW-846 8260
108-88-3	Toluene	77	109.8	%REC	25	23	SW-846 8260
10061-02-6	trans-1,3-Dichloropropene	86.87	112.7	%REC	25	23	SW-846 8260

CAS No.	Analyte	Minimum % REC	Maximum %REC	Unit	Number of Analyses	Number of Batches	Test Method
79-01-6	Trichloroethene	82.8	118	%REC	25	23	SW-846 8260
75-01-4	Vinyl chloride	58.24	198.6	%REC	25	23	SW-846 8260
1330-20-7	Xylene	80	113.2	%REC	25	23	SW-846 8260
120-82-1	1,2,4-Trichlorobenzene	64	76	%REC	14	14	SW-846 8270
95-95-4	2,4,5-Trichlorophenol	68	89	%REC	14	14	SW-846 8270
88-06-2	2,4,6-Trichlorophenol	69	85	%REC	14	14	SW-846 8270
120-83-2	2,4-Dichlorophenol	66	81	%REC	14	14	SW-846 8270
105-67-9	2,4-Dimethylphenol	69	82	%REC	14	14	SW-846 8270
51-28-5	2,4-Dinitrophenol	36	73	%REC	14	14	SW-846 8270
121-14-2	2,4-Dinitrotoluene	64	91	%REC	14	14	SW-846 8270
606-20-2	2,6-Dinitrotoluene	62	83	%REC	14	14	SW-846 8270
91-58-7	2-Chloronaphthalene	61	77	%REC	14	14	SW-846 8270
95-57-8	2-Chlorophenol	69	82	%REC	14	14	SW-846 8270
91-57-6	2-Methylnaphthalene	65	77	%REC	14	14	SW-846 8270
95-48-7	2-Methylphenol	67	79	%REC	14	14	SW-846 8270
88-74-4	2-Nitroaniline	60	79	%REC	14	14	SW-846 8270
91-94-1	3,3'-Dichlorobenzidine	39	66	%REC	14	14	SW-846 8270
534-52-1	4,6-Dinitro-2-methylphenol	45	84	%REC	14	14	SW-846 8270
106-47-8	4-Chloroaniline	20	67	%REC	14	14	SW-846 8270
106-44-5	4-Methylphenol	67	82	%REC	14	14	SW-846 8270
100-02-7	4-Nitrophenol	61	90	%REC	14	14	SW-846 8270
83-32-9	Acenaphthene	64	76	%REC	14	14	SW-846 8270
120-12-7	Anthracene	64	87	%REC	14	14	SW-846 8270
56-55-3	Benzo(a)anthracene	58	84	%REC	14	14	SW-846 8270
50-32-8	Benzo(a)pyrene	62	89	%REC	14	14	SW-846 8270
205-99-2	Benzo(b)fluoranthene	57	90	%REC	14	14	SW-846 8270
207-08-9	Benzo(k)fluoranthene	57	88	%REC	14	14	SW-846 8270
65-85-0	Benzoic Acid	24	67	%REC	14	14	SW-846 8270
100-51-6	Benzyl Alcohol	55	81	%REC	14	14	SW-846 8270
111-44-4	bis(2-Chloroethyl)ether	62	74	%REC	14	14	SW-846 8270
39638-32-9	bis(2-Chloroisopropyl)ether	61	83	%REC	14	14	SW-846 8270
117-81-7	bis(2-Ethylhexyl)phthalate	58	85	%REC	14	14	SW-846 8270
85-68-7	Butylbenzylphthalate	56	85	%REC	14	14	SW-846 8270
218-01-9	Chrysene	61	87	%REC	14	14	SW-846 8270
53-70-3	Dibenz(a,h)anthracene	59	87	%REC	14	14	SW-846 8270
132-64-9	Dibenzofuran	64	83	%REC	14	14	SW-846 8270
84-66-2	Diethylphthalate	65	88	%REC	14	14	SW-846 8270
131-11-3	Dimethylphthalate	64	83	%REC	14	14	SW-846 8270
84-74-2	Di-n-butylphthalate	60	82	%REC	14	14	SW-846 8270
117-84-0	Di-n-octylphthalate	55	81	%REC	14	14	SW-846 8270
206-44-0	Fluoranthene	64	80	%REC	14	14	SW-846 8270
86-73-7	Fluorene	64	85	%REC	14	14	SW-846 8270
118-74-1	Hexachlorobenzene	61	82	%REC	14	14	SW-846 8270

CAS No.	Analyte	Minimum % REC	Maximum %REC	Unit	Number of Analyses	Number of Batches	Test Method
87-68-3	Hexachlorobutadiene	63	82	%REC	14	14	SW-846 8270
77-47-4	Hexachlorocyclopentadiene	49	84	%REC	14	14	SW-846 8270
67-72-1	Hexachloroethane	64	82	%REC	14	14	SW-846 8270
193-39-5	Indeno(1,2,3-cd)pyrene	60	87	%REC	14	14	SW-846 8270
78-59-1	Isophorone	68	105	%REC	14	14	SW-846 8270
91-20-3	Naphthalene	65	76	%REC	14	14	SW-846 8270
98-95-3	Nitrobenzene	64	81	%REC	14	14	SW-846 8270
86-30-6	n-Nitrosodiphenylamine	71	104	%REC	14	14	SW-846 8270
621-64-7	n-Nitrosodipropylamine	64	78	%REC	14	14	SW-846 8270
87-86-5	Pentachlorophenol	46	85	%REC	14	14	SW-846 8270
108-95-2	Phenol	66	80	%REC	14	14	SW-846 8270
129-00-0	Pyrene	59	87	%REC	14	14	SW-846 8270
14797-55-8	Nitrate	91	100	%REC	20	10	SW9056 OR E300.0 PREP E300.0

Table 11
Surrogate Recovery Summary

VOC Surrogate Recoveries				
Surrogate Frequency	Analyte	Minimum	Maximum	Unit Code
47	1,2-Dichloroethane -d4	87.41	117.9	%REC
47	Bromofluorobenzene	82	134.1	%REC
47	Toluene - d8	86	114.5	%REC
SVOC - Surrogate Recoveries				
Surrogate Frequency	Analyte	Minimum	Maximum	Unit Code
38	2-Fluorobiphenyl	55	82	%REC
38	Nitrobenzene-d5	52	271	%REC
38	o-Fluorophenol	43	87	%REC
38	Terphenyl-d14	55	87	%REC

Benzo(a)pyrene results associated with the lowest SVOC surrogate (o-fluorophenol, 43 percent recovery) were also checked and were below the corrected WRW AL.

Project decisions were not impacted by VOC or other SVOC surrogate recoveries. Any qualifications of results due to surrogate results are also captured in the V&V flags, described in Section 13.2.3.

Field Blank Evaluation

Results of the field blank analyses are provided in Table 12. Detectable amounts of contaminants within the blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminant is detected in the associated real samples. When the real result is less than 10 times the blank result for laboratory contaminants and 5 times the result for nonlaboratory contaminants, the real result is eliminated. Conversely, if the chemicals detected in the blanks had concentrations less than one-tenth the WRW AL, then sample results should not be affected by blank contamination. None of the analytes detected in the blanks exceeded

one-tenth of the WRW ALs. Therefore, blank contamination did not adversely impact project decisions.

Table 12
Field Blank Summary

Sample QC Code	Test Method	Analyte	Max of Result	Unit	CAS No.
RNS	GAMMA SPECTROSCOPY	Uranium-235	0.222	pCi/g	15117-96-1
RNS	GAMMA SPECTROSCOPY	Uranium-238	2.39	pCi/g	7440-61-1
FB	SW-846 6010	Barium	0.0012	mg/L	7440-39-3
FB	SW-846 6010	Beryllium	0.0006	mg/L	7440-41-7
FB	SW-846 6010	Cadmium	0.0014	mg/L	7440-43-9
FB	SW-846 6010	Copper	0.0019	mg/L	7440-50-8
FB	SW-846 6010	Manganese	0.0011	mg/L	7439-96-5
FB	SW-846 6010	Strontium	0.0005	mg/L	7440-24-6
FB	SW-846 6010	Zinc	0.05	mg/L	7440-66-6
RNS	SW-846 6010	Aluminum	0.035	mg/L	7429-90-5
RNS	SW-846 6010	Barium	0.0054	mg/L	7440-39-3
RNS	SW-846 6010	Beryllium	0.0007	mg/L	7440-41-7
RNS	SW-846 6010	Copper	0.0027	mg/L	7440-50-8
RNS	SW-846 6010	Manganese	0.0023	mg/L	7439-96-5
RNS	SW-846 6010	Selenium	0.0062	mg/L	7782-49-2
RNS	SW-846 6010	Strontium	0.0024	mg/L	7440-24-6
RNS	SW-846 6010	Zinc	0.056	mg/L	7440-66-6
RNS	SW-846 8260	Acetone	9.7	ug/L	67-64-1
RNS	SW-846 8260	Naphthalene	0.99	ug/L	91-20-3
TB	SW-846 8260	Acetone	11	ug/L	67-64-1
TB	SW-846 8260	Benzene	2.2	ug/L	71-43-2
TB	SW-846 8260	Bromodichloromethane	4.1	ug/L	75-27-4
TB	SW-846 8260	Carbon Disulfide	0.34	ug/L	75-15-0
TB	SW-846 8260	Chloroform	170	ug/L	67-66-3
TB	SW-846 8260	Naphthalene	1.2	ug/L	91-20-3
TB	SW-846 8260	Toluene	6.76	ug/L	108-88-3
TB	SW-846 8260	Xylene	6.3	ug/L	1330-20-7

Field blank (trip = TB, rinse = RNS, field = FB) results greater than detection limits (not *U* qualified)

Sample MS Evaluation

MS measurements, relative to each laboratory batch, were adequate based on at least one MS per batch. The minimum and maximum MS results are summarized by chemical for the entire project in Table 13. Organic analytes with unacceptable low recoveries resulted in a review of the LCS recoveries. According to the EPA data validation guidelines, if organic MS recoveries are low, then the LCS recovery is to be checked and, if acceptable, no action is taken. For this project, these checks indicate no decisions were impacted for organic analytes (refer to previous section).

Table 13
Sample MS Evaluation

CAS No.	Analyte	Minimum Result	Maximum Result	Unit	Number of Laboratory Samples	Number of Laboratory Batches	Test Method
7429-90-5	Aluminum	0	5470	%REC	15	15	SW-846 6010
7440-36-0	Antimony	35	59	%REC	15	15	SW-846 6010
7440-38-2	Arsenic	88	95	%REC	15	15	SW-846 6010
7440-39-3	Barium	88	115	%REC	15	15	SW-846 6010
7440-41-7	Beryllium	86	104	%REC	15	15	SW-846 6010
7440-43-9	Cadmium	79	96	%REC	15	15	SW-846 6010
7440-47-3	Chromium	0	145	%REC	15	15	SW-846 6010
7440-48-4	Cobalt	85	101	%REC	15	15	SW-846 6010
7440-50-8	Copper	32	162	%REC	15	15	SW-846 6010
7439-89-6	Iron	0	13600	%REC	15	15	SW-846 6010
7439-92-1	Lead	0	99	%REC	15	15	SW-846 6010
7439-93-2	Lithium	92	113	%REC	15	15	SW-846 6010
7439-96-5	Manganese	0	375	%REC	15	15	SW-846 6010
7439-97-6	Mercury	73	217	%REC	14	14	SW-846 6010
7439-98-7	Molybdenum	81	93	%REC	15	15	SW-846 6010
7440-02-0	Nickel	43	115	%REC	15	15	SW-846 6010
7782-49-2	Selenium	86	97	%REC	15	15	SW-846 6010
7440-22-4	Silver	76	99	%REC	15	15	SW-846 6010
7440-24-6	Strontium	89	129	%REC	15	15	SW-846 6010
7440-31-5	Tin	83	92	%REC	15	15	SW-846 6010
11-09-7	Uranium, Total	91	99	%REC	15	15	SW-846 6010
7440-62-2	Vanadium	74	130	%REC	15	15	SW-846 6010
7440-66-6	Zinc	47	114	%REC	15	15	SW-846 6010
12674-11-2	Aroclor-1016	65	210	%REC	3	3	SW-846 8082
11096-82-5	Aroclor-1260	62	110	%REC	3	3	SW-846 8082
71-55-6	1,1,1-Trichloroethane	79	112.7	%REC	9	9	SW-846 8260
79-34-5	1,1,2,2-Tetrachloroethane	4.28	106.1	%REC	9	9	SW-846 8260
79-00-5	1,1,2-Trichloroethane	27.9	112.7	%REC	9	9	SW-846 8260
75-34-3	1,1-Dichloroethane	86.33	124	%REC	9	9	SW-846 8260
75-35-4	1,1-Dichloroethene	78.74	164.5	%REC	9	9	SW-846 8260
120-82-1	1,2,4-Trichlorobenzene	47.8	72.7	%REC	9	9	SW-846 8260
95-50-1	1,2-Dichlorobenzene	57.05	90.22	%REC	9	9	SW-846 8260
107-06-2	1,2-Dichloroethane	82.28	116	%REC	9	9	SW-846 8260
78-87-5	1,2-Dichloropropane	78.27	111.1	%REC	9	9	SW-846 8260
106-46-7	1,4-Dichlorobenzene	38.91	90	%REC	9	9	SW-846 8260
78-93-3	2-Butanone	75.38	174.2	%REC	9	9	SW-846 8260
108-10-1	4-Methyl-2-pentanone	66.64	110.7	%REC	9	9	SW-846 8260
67-64-1	Acetone	0	230.1	%REC	9	9	SW-846 8260
71-43-2	Benzene	38.9	126.2	%REC	9	9	SW-846 8260

CAS No.	Analyte	Minimum Result	Maximum Result	Unit	Number of Laboratory Samples	Number of Laboratory Batches	Test Method
75-27-4	Bromodichloromethane	76.53	107.4	%REC	9	9	SW-846 8260
75-25-2	Bromoform	70.82	97	%REC	9	9	SW-846 8260
74-83-9	Bromomethane	75	118.4	%REC	9	9	SW-846 8260
75-15-0	Carbon Disulfide	70.11	103.6	%REC	9	9	SW-846 8260
56-23-5	Carbon Tetrachloride	77	109	%REC	9	9	SW-846 8260
108-90-7	Chlorobenzene	19.47	102.7	%REC	9	9	SW-846 8260
75-00-3	Chloroethane	77	120.5	%REC	9	9	SW-846 8260
67-66-3	Chloroform	0	108.2	%REC	9	9	SW-846 8260
74-87-3	Chloromethane	61	137.6	%REC	9	9	SW-846 8260
10061-01-5	cis-1,3-Dichloropropene	56.71	98.35	%REC	9	9	SW-846 8260
124-48-1	Dibromochloromethane	72.54	102	%REC	9	9	SW-846 8260
100-41-4	Ethylbenzene	26.69	98.06	%REC	9	9	SW-846 8260
87-68-3	Hexachlorobutadiene	28.3	77.28	%REC	9	9	SW-846 8260
75-09-2	Methylene chloride	78.5	104.8	%REC	9	9	SW-846 8260
91-20-3	Naphthalene	0	85.89	%REC	8	8	SW-846 8260
100-42-5	Styrene	12.99	98.1	%REC	9	9	SW-846 8260
127-18-4	Tetrachloroethene	0	93.02	%REC	9	9	SW-846 8260
108-88-3	Toluene	26.87	130.2	%REC	9	9	SW-846 8260
10061-02-6	trans-1,3-Dichloropropene	63.25	95	%REC	9	9	SW-846 8260
79-01-6	Trichloroethene	81	128.1	%REC	9	9	SW-846 8260
75-01-4	Vinyl chloride	71	125.4	%REC	9	9	SW-846 8260
1330-20-7	Xylene	0	99.33	%REC	9	9	SW-846 8260
120-82-1	1,2,4-Trichlorobenzene	54	75	%REC	14	14	SW-846 8270
95-95-4	2,4,5-Trichlorophenol	50	82	%REC	14	14	SW-846 8270
88-06-2	2,4,6-Trichlorophenol	38	86	%REC	14	14	SW-846 8270
120-83-2	2,4-Dichlorophenol	41	76	%REC	14	14	SW-846 8270
105-67-9	2,4-Dimethylphenol	57	80	%REC	14	14	SW-846 8270
51-28-5	2,4-Dinitrophenol	20	75	%REC	14	14	SW-846 8270
121-14-2	2,4-Dinitrotoluene	56	86	%REC	14	14	SW-846 8270
606-20-2	2,6-Dinitrotoluene	54	81	%REC	14	14	SW-846 8270
91-58-7	2-Chloronaphthalene	52	77	%REC	14	14	SW-846 8270
95-57-8	2-Chlorophenol	50	80	%REC	14	14	SW-846 8270
91-57-6	2-Methylnaphthalene	55	72	%REC	14	14	SW-846 8270
95-48-7	2-Methylphenol	56	79	%REC	14	14	SW-846 8270
88-74-4	2-Nitroaniline	50	75	%REC	14	14	SW-846 8270
91-94-1	3,3'-Dichlorobenzidine	0	64	%REC	14	14	SW-846 8270
534-52-1	4,6-Dinitro-2-methylphenol	34	83	%REC	14	14	SW-846 8270
106-47-8	4-Chloroaniline	45	65	%REC	14	14	SW-846 8270
106-44-5	4-Methylphenol	56	81	%REC	14	14	SW-846 8270
100-02-7	4-Nitrophenol	46	92	%REC	14	14	SW-846 8270
83-32-9	Acenaphthene	36	75	%REC	14	14	SW-846 8270
120-12-7	Anthracene	46	85	%REC	14	14	SW-846 8270

CAS No.	Analyte	Minimum Result	Maximum Result	Unit	Number of Laboratory Samples	Number of Laboratory Batches	Test Method
56-55-3	Benzo(a)anthracene	36	79	%REC	14	14	SW-846 8270
50-32-8	Benzo(a)pyrene	36	83	%REC	14	14	SW-846 8270
205-99-2	Benzo(b)fluoranthene	44	85	%REC	14	14	SW-846 8270
207-08-9	Benzo(k)fluoranthene	35	78	%REC	14	14	SW-846 8270
65-85-0	Benzoic Acid	0	50	%REC	14	14	SW-846 8270
100-51-6	Benzyl Alcohol	50	78	%REC	14	14	SW-846 8270
111-44-4	bis(2-Chloroethyl)ether	51	76	%REC	14	14	SW-846 8270
39638-32-9	bis(2-Chloroisopropyl)ether	52	82	%REC	14	14	SW-846 8270
117-81-7	bis(2-Ethylhexyl)phthalate	2.4	154	%REC	14	14	SW-846 8270
85-68-7	Butylbenzylphthalate	51	85	%REC	14	14	SW-846 8270
218-01-9	Chrysene	0	80	%REC	14	14	SW-846 8270
53-70-3	Dibenz(a,h)anthracene	51	86	%REC	14	14	SW-846 8270
132-64-9	Dibenzofuran	52	80	%REC	14	14	SW-846 8270
84-66-2	Diethylphthalate	53	85	%REC	14	14	SW-846 8270
131-11-3	Dimethylphthalate	53	81	%REC	14	14	SW-846 8270
84-74-2	Di-n-butylphthalate	52	84	%REC	14	14	SW-846 8270
117-84-0	Di-n-octylphthalate	45	84	%REC	14	14	SW-846 8270
206-44-0	Fluoranthene	7.7	88	%REC	14	14	SW-846 8270
86-73-7	Fluorene	42	81	%REC	14	14	SW-846 8270
118-74-1	Hexachlorobenzene	52	77	%REC	14	14	SW-846 8270
87-68-3	Hexachlorobutadiene	53	80	%REC	14	14	SW-846 8270
77-47-4	Hexachlorocyclopentadiene	12	83	%REC	14	14	SW-846 8270
67-72-1	Hexachloroethane	51	75	%REC	14	14	SW-846 8270
193-39-5	Indeno(1,2,3-cd)pyrene	43	84	%REC	14	14	SW-846 8270
78-59-1	Isophorone	65	96	%REC	14	14	SW-846 8270
91-20-3	Naphthalene	54	72	%REC	14	14	SW-846 8270
98-95-3	Nitrobenzene	52	75	%REC	14	14	SW-846 8270
86-30-6	n-Nitrosodiphenylamine	61	96	%REC	14	14	SW-846 8270
621-64-7	n-Nitrosodipropylamine	54	76	%REC	14	14	SW-846 8270
87-86-5	Pentachlorophenol	19	72	%REC	14	14	SW-846 8270
108-95-2	Phenol	57	80	%REC	14	14	SW-846 8270
129-00-0	Pyrene	7.3	73	%REC	14	14	SW-846 8270
14797-55-8	Nitrate	93	108	%REC	10	10	SW9056 OR E300.0 PREP E300.0

For inorganics with MS recoveries greater than zero, the maximum sample results were divided by the lowest percent recovery for each analyte. If the resulting number was less than the AL, decisions were not impacted. For this project, only the maximum arsenic concentration failed the criteria; however, the occurrence is a known WRW AL exceedance. All other inorganic results with MS recoveries greater than zero, including all other arsenic analyses, were acceptable. Therefore, except in the case mentioned above, analytical accuracy for inorganics

was not affected by MS recoveries greater than 0 percent and project decisions were not impacted.

Aluminum, chromium, iron, lead, and manganese had 0 percent recovery as a low. For aluminum, iron, lead, and manganese, the WRW AL was at least three times greater than the highest sample result, so no decisions were impacted. Chromium failed this criteria (the chromium WRW AL is 268 mg/kg). The highest chromium result (200 mg/kg) had a minimum MS recovery of 107 percent, and this may indicate that the concentration is actually less than reported. Because chromium results were below the WRW AL, they did not drive project decisions.

13.2.2 Precision

"Precision" is measured by evaluating both MSDs and field duplicates as described in the following sections.

Matrix Spike Duplicate Evaluation

Laboratory precision is measured through the use of MSDs. Adequate frequency of MSD measurements is indicated by at least one MSD in each laboratory batch. Table 14 indicates that MSD frequencies were adequate. The analytes with the highest relative percent differences (RPDs) (>35 percent) were reviewed by comparing the highest sample result to the WRW AL.

Table 14
Sample MSD Evaluation

Test Method	CAS No.	Analyte	Number of Sample Pairs	Number of Lab Batches	RPD Maximum
SW-846 6010	7429-90-5	Aluminum	11	11	94.88
SW-846 6010	7440-36-0	Antimony	15	15	32.91
SW-846 6010	7440-38-2	Arsenic	15	15	2.20
SW-846 6010	7440-39-3	Barium	15	15	15.96
SW-846 6010	7440-41-7	Beryllium	15	15	12.24
SW-846 6010	7440-43-9	Cadmium	15	15	7.89
SW-846 6010	7440-47-3	Chromium	14	14	33.82
SW-846 6010	7440-48-4	Cobalt	15	15	27.03
SW-846 6010	7440-50-8	Copper	15	15	116.05
SW-846 6010	7439-89-6	Iron	5	5	176.94
SW-846 6010	7439-92-1	Lead	13	13	13.04
SW-846 6010	7439-93-2	Lithium	15	15	6.45
SW-846 6010	7439-96-5	Manganese	12	12	192.32
SW-846 6010	7439-97-6	Mercury	14	14	41.30
SW-846 6010	7439-98-7	Molybdenum	15	15	4.94
SW-846 6010	7440-02-0	Nickel	15	15	12.09
SW-846 6010	7782-49-2	Selenium	15	15	3.43
SW-846 6010	7440-22-4	Silver	15	15	21.18
SW-846 6010	7440-24-6	Strontium	15	15	38.57

Test Method	CAS No.	Analyte	Number of Sample Pairs	Number of Lab Batches	RPD Maximum
SW-846 6010	7440-31-5	Tin	15	15	3.51
SW-846 6010	11-09-7	Uranium, Total	15	15	3.31
SW-846 6010	7440-62-2	Vanadium	15	15	53.33
SW-846 6010	7440-66-6	Zinc	15	15	20.18
SW-846 8082	12674-11-2	Aroclor-1016	3	3	17.62
SW-846 8082	11096-82-5	Aroclor-1260	3	3	25.51
SW-846 8260	71-55-6	1,1,1-Trichloroethane	9	9	9.00
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	9	9	37.78
SW-846 8260	79-00-5	1,1,2-Trichloroethane	9	9	28.59
SW-846 8260	75-34-3	1,1-Dichloroethane	9	9	8.99
SW-846 8260	75-35-4	1,1-Dichloroethene	9	9	9.54
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	9	9	18.84
SW-846 8260	95-50-1	1,2-Dichlorobenzene	9	9	12.09
SW-846 8260	107-06-2	1,2-Dichloroethane	9	9	9.39
SW-846 8260	78-87-5	1,2-Dichloropropane	9	9	11.52
SW-846 8260	106-46-7	1,4-Dichlorobenzene	9	9	21.17
SW-846 8260	78-93-3	2-Butanone	9	9	17.40
SW-846 8260	108-10-1	4-Methyl-2-pentanone	9	9	16.50
SW-846 8260	67-64-1	Acetone	8	8	18.55
SW-846 8260	71-43-2	Benzene	9	9	11.29
SW-846 8260	75-27-4	Bromodichloromethane	9	9	14.14
SW-846 8260	75-25-2	Bromoform	9	9	13.50
SW-846 8260	74-83-9	Bromomethane	9	9	14.64
SW-846 8260	75-15-0	Carbon Disulfide	9	9	10.45
SW-846 8260	56-23-5	Carbon Tetrachloride	9	9	9.89
SW-846 8260	108-90-7	Chlorobenzene	9	9	53.22
SW-846 8260	75-00-3	Chloroethane	9	9	11.20
SW-846 8260	67-66-3	Chloroform	8	8	9.94
SW-846 8260	74-87-3	Chloromethane	9	9	19.29
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	9	9	12.04
SW-846 8260	124-48-1	Dibromochloromethane	9	9	14.20
SW-846 8260	100-41-4	Ethylbenzene	9	9	60.65
SW-846 8260	87-68-3	Hexachlorobutadiene	9	9	31.08
SW-846 8260	75-09-2	Methylene chloride	9	9	12.78
SW-846 8260	91-20-3	Naphthalene	7	7	108.55
SW-846 8260	100-42-5	Styrene	9	9	58.80
SW-846 8260	127-18-4	Tetrachloroethene	8	8	9.87
SW-846 8260	108-88-3	Toluene	9	9	33.96
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	9	9	8.20
SW-846 8260	79-01-6	Trichloroethene	8	8	13.85
SW-846 8260	75-01-4	Vinyl chloride	9	9	16.66
SW-846 8260	1330-20-7	Xylene	8	8	14.08

Test Method	CAS No.	Analyte	Number of Sample Pairs	Number of Lab Batches	RPD Maximum
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	14	14	14.71
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	14	14	14.81
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	14	14	17.14
SW-846 8270	120-83-2	2,4-Dichlorophenol	14	14	11.11
SW-846 8270	105-67-9	2,4-Dimethylphenol	14	14	9.38
SW-846 8270	51-28-5	2,4-Dinitrophenol	14	14	54.55
SW-846 8270	121-14-2	2,4-Dinitrotoluene	14	14	14.77
SW-846 8270	606-20-2	2,6-Dinitrotoluene	14	14	10.53
SW-846 8270	91-58-7	2-Chloronaphthalene	14	14	9.17
SW-846 8270	95-57-8	2-Chlorophenol	14	14	16.67
SW-846 8270	91-57-6	2-Methylnaphthalene	14	14	40.51
SW-846 8270	95-48-7	2-Methylphenol	14	14	16.06
SW-846 8270	88-74-4	2-Nitroaniline	14	14	8.55
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	13	13	10.10
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	14	14	21.05
SW-846 8270	106-47-8	4-Chloroaniline	14	14	18.18
SW-846 8270	106-44-5	4-Methylphenol	14	14	11.59
SW-846 8270	100-02-7	4-Nitrophenol	14	14	28.95
SW-846 8270	83-32-9	Acenaphthene	14	14	90.08
SW-846 8270	120-12-7	Anthracene	14	14	72.22
SW-846 8270	56-55-3	Benzo(a)anthracene	14	14	85.71
SW-846 8270	50-32-8	Benzo(a)pyrene	13	13	89.23
SW-846 8270	205-99-2	Benzo(b)fluoranthene	14	14	52.78
SW-846 8270	207-08-9	Benzo(k)fluoranthene	14	14	84.30
SW-846 8270	65-85-0	Benzoic Acid	12	12	82.35
SW-846 8270	100-51-6	Benzyl Alcohol	14	14	14.88
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	14	14	17.89
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	14	14	19.05
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	13	13	62.13
SW-846 8270	85-68-7	Butylbenzylphthalate	14	14	9.01
SW-846 8270	218-01-9	Chrysene	13	13	17.86
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	14	14	33.85
SW-846 8270	132-64-9	Dibenzofuran	14	14	53.52
SW-846 8270	84-66-2	Diethylphthalate	14	14	7.79
SW-846 8270	131-11-3	Dimethylphthalate	14	14	8.00
SW-846 8270	84-74-2	Di-n-butylphthalate	14	14	10.96
SW-846 8270	117-84-0	Di-n-octylphthalate	14	14	14.29
SW-846 8270	206-44-0	Fluoranthene	14	14	183.68
SW-846 8270	86-73-7	Fluorene	14	14	74.63
SW-846 8270	118-74-1	Hexachlorobenzene	14	14	10.22
SW-846 8270	87-68-3	Hexachlorobutadiene	14	14	17.39
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	14	14	63.74

Test Method	CAS No.	Analyte	Number of Sample Pairs	Number of Lab Batches	RPD Maximum
SW-846 8270	67-72-1	Hexachloroethane	14	14	17.91
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	14	14	63.49
SW-846 8270	78-59-1	Isophorone	14	14	10.53
SW-846 8270	91-20-3	Naphthalene	14	14	54.09
SW-846 8270	98-95-3	Nitrobenzene	14	14	15.15
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	14	14	13.76
SW-846 8270	621-64-7	n-Nitrosodipropylamine	14	14	13.95
SW-846 8270	87-86-5	Pentachlorophenol	14	14	37.04
SW-846 8270	108-95-2	Phenol	14	14	14.29
SW-846 8270	129-00-0	Pyrene	14	14	167.66
SW9056 OR E300.0 PREP E300.0	14797-55-8	Nitrate	10	10	6.70

For analytes with RPDs greater than 35 percent, if the highest sample results were sufficiently below the ALs, no further action was needed. The maximum benzo(a)pyrene concentration (3,700 mg/kg) failed this criterion; however, this benzo(a)pyrene result is a WRW AL exceedance. The next highest benzo(a)pyrene, at 970 mg/kg, passes the criterion. Although some of the RPDs appear to be high and one benzo(a)pyrene result fails the evaluation, precision is not impacted by the MSD evaluation and therefore neither are project decisions.

Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Table 15 indicates that sampling frequencies were inadequate with respect to radionuclides analyzed using alpha spectroscopy.

Table 15
Field Duplicate Sample Frequency

Test Method	Sample Code	Number of Samples	% Duplicate Samples
ALPHA SPEC	REAL	5	0%
GAMMA SPECTROSCOPY	REAL	37	8%
GAMMA SPECTROSCOPY	DUP	2	
SW-846 6010	REAL	42	5%
SW-846 6010	DUP	2	
SW-846 6200	REAL	5	20%
SW-846 6200	DUP	1	
SW-846 8082	REAL	15	12%
SW-846 8082	DUP	1	
SW-846 8260	REAL	47	6%
SW-846 8260	DUP	3	

Test Method	Sample Code	Number of Samples	% Duplicate Samples
SW-846 8270	REAL	43	7%
SW-846 8270	DUP	3	
SW9056 OR E300.0 PREP E300.0	REAL	32	6%
SW9056 OR E300.0 PREP E300.0	DUP	2	

Duplicate sample RPDs indicate how much variation exists in the field duplicate analyses; duplicate sample RPDs are provided in Table 16.

Table 16
RPD Evaluation

Lab Code	Analyte	Max of Result RPD
ESTLDEN	Aluminum	31.11
ESTLDEN	Arsenic	34.39
URS	Barium	8.61
ESTLDEN	Barium	34.39
ESTLDEN	Beryllium	31.11
ESTLDEN	Chromium	28.57
ESTLDEN	Cobalt	46.67
URS	Copper	14.99
ESTLDEN	Copper	16.67
URS	Iron	2.44
ESTLDEN	Iron	19.35
ESTLDEN	Lead	30.09
ESTLDEN	Lithium	25.00
ESTLDEN	Manganese	24.00
ESTLDEN	Mercury	16.82
ESTLDEN	Nickel	40.00
URS	Strontium	2.55
ESTLDEN	Strontium	38.30
ESTLDEN	Tin	3.08
ESTLDEN	Vanadium	33.77
ESTLDEN	Zinc	33.85
URS	Zinc	37.81
ESTLDEN	1,2,4-Trichlorobenzene	2.78
ESTLDEN	2,4,5-Trichlorophenol	2.78
ESTLDEN	2,4,6-Trichlorophenol	2.78
ESTLDEN	2,4-Dichlorophenol	2.78
ESTLDEN	2,4-Dimethylphenol	2.78
ESTLDEN	2,4-Dinitrophenol	2.74
ESTLDEN	2,4-Dinitrotoluene	2.78
ESTLDEN	2,6-Dinitrotoluene	2.78

Lab Code	Analyte	Max of Result RPD
ESTLDEN	2-Chloronaphthalene	2.78
ESTLDEN	2-Chlorophenol	2.78
ESTLDEN	2-Methylnaphthalene	2.78
ESTLDEN	2-Methylphenol	2.78
ESTLDEN	2-Nitroaniline	2.74
ESTLDEN	4,6-Dinitro-2-methylphenol	2.74
ESTLDEN	4-Chloroaniline	6.90
ESTLDEN	4-Methylphenol	2.78
ESTLDEN	4-Nitrophenol	2.74
ESTLDEN	Acenaphthene	2.74
ESTLDEN	Anthracene	2.74
ESTLDEN	Benzo(a)anthracene	2.78
ESTLDEN	Benzo(a)pyrene	2.78
ESTLDEN	Benzo(b)fluoranthene	2.78
ESTLDEN	Benzo(k)fluoranthene	2.78
ESTLDEN	Benzoic Acid	2.74
ESTLDEN	Benzyl Alcohol	6.90
ESTLDEN	bis(2-Chloroethyl)ether	2.78
ESTLDEN	bis(2-Chloroisopropyl)ether	2.78
ESTLDEN	bis(2-Ethylhexyl)phthalate	2.70
ESTLDEN	Butylbenzylphthalate	2.70
ESTLDEN	Chrysene	2.78
ESTLDEN	Dibenz(a,h)anthracene	2.78
ESTLDEN	Dibenzofuran	2.78
ESTLDEN	Diethylphthalate	2.78
ESTLDEN	Dimethylphthalate	2.78
ESTLDEN	Di-n-butylphthalate	2.78
ESTLDEN	Di-n-octylphthalate	2.78
ESTLDEN	Fluorene	2.78
ESTLDEN	Hexachlorobenzene	2.78
ESTLDEN	Hexachlorobutadiene	2.78
ESTLDEN	Hexachlorocyclopentadiene	2.78
ESTLDEN	Hexachloroethane	2.78
ESTLDEN	Indeno(1,2,3-cd)pyrene	2.78
ESTLDEN	Isophorone	2.78
ESTLDEN	Naphthalene	2.78
ESTLDEN	Nitrobenzene	2.78
ESTLDEN	n-Nitrosodiphenylamine	2.78
ESTLDEN	n-Nitrosodipropylamine	2.78
ESTLDEN	Pentachlorophenol	2.74
ESTLDEN	Phenol	2.78
ESTLDEN	Pyrene	2.70
STLDEN	Aroclor-1221	0.00

Lab Code	Analyte	Max of Result RPD
ESTLDEN	Aroclor-1221	2.60
STLDEN	Aroclor-1232	0.00
ESTLDEN	Aroclor-1232	2.60
STLDEN	Aroclor-1242	0.00
ESTLDEN	Aroclor-1242	2.60
ESTLDEN	Aroclor-1254	137.35
STLDEN	Aroclor-1260	0.00
ESTLDEN	Aroclor-1260	2.60
ESTLDEN	Nitrate	21.54

The EPA data validation guidelines state that "there are no required review criteria for field duplicate analyses comparability" (EPA 1994b). For the DQA, the highest maximum RPDs (> 35 percent) were reviewed. Cobalt, nickel, strontium, zinc, and aroclor-1254 had maximum RPDs greater than 35 percent. The analytes with the highest maximum RPDs were reviewed by comparing the highest sample result to the WRW AL. If the highest sample concentrations are sufficiently below the AL (<10 percent), no further action is needed. For this project, cobalt, nickel, strontium, zinc, and aroclor-1254 concentrations were less than 10 percent of the WRW ALs. Therefore, project decisions were not impacted by the maximum RPD values.

13.2.3 Completeness

Based on original project DQOs, a minimum of 25 percent of ER Program analytical (and radiological) results must be formally verified and validated. Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. Table 17 shows the number and percentage of validated records (codes without "1"), the number and percentage of verified records (codes with "1"), and the percentage of rejected records for each analyte group.

Table 17
Validation and Verification Summary

Validation Qualifier Code	Total of CAS Number	Alpha Spec Results	Gamma Spectroscopy Results	SW-846 6010 Results	SW-846 6200 Results	SW-846 8082 Results	SW-846 8260 Results	SW-846 8270 Results	SW-9056 or E300.0 Prep E300.0 Results
J	81	0	0	76	0	0	2	0	3
J1	161	0	0	118	5	0	14	0	24
R	1	0	0	0	0	0	0	0	1
R1	6	0	0	0	0	0	0	0	6
V	1660	5	36	346	0	0	493	780	0
V1	3103	20	78	387	85	112	970	1451	0
JB	8	0	0	0	0	0	8	0	0

Validation Qualifier Code	Total of CAS Number	Alpha Spec Results	Gamma Spectroscopy Results	SW-846 6010 Results	SW-846 6200 Results	SW-846 8082 Results	SW-846 8260 Results	SW-846 8270 Results	SW-9056 or E300.0 Prep E300.0 Results
JB1	13	0	0	0	0	0	13	0	0
UJ	21	0	0	15	0	0	4	0	2
UJ1	91	0	0	24	0	0	59	5	3
Total	5145	25	114	966	90	112	1563	2236	39
Validated	1771	5	36	437	0	0	507	780	6
% Validated	34.42%	20.00%	31.58%	45.24%	0.00%	0.00%	32.44%	34.88%	15.38%
Verified	3374	20	78	529	90	112	1056	1456	33
% Verified	65.58%	80.00%	68.42%	54.76%	100.00 %	100.00 %	67.56%	65.12%	84.62%
Rejected	7	0	0	0	0	0	0	0	7
% Rejected	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.95%

KEY: Validations: J = Estimated, JB = Estimated with possible laboratory contamination, R = Rejected, UJ = Estimated detection limit, V = Validated
Verifications: J1 = Estimated, JB1 = Estimated with possible laboratory contamination, R1 = Rejected, UJ1 = Estimated detection limit, V1 = Validated

Analytical records and results indicate that these data are adequate because the frequency of validation is within project quality requirements and in compliance with the RFETS validation goal of 25 percent. The 17.95 percent rejection rate for nitrate results (method SW9056 or E300.0) is unacceptable. Of the seven analyses rejected, five were for nonlaboratory hold-time exceedances and two were for laboratory hold-time exceedances. These rejections did not impact project decisions.

13.2.4 Sensitivity

Reporting limits, in units of μg/kg for organics, mg/kg for metals, and picocuries per gram (pCi/g) for radionuclides, were compared with the RFCA WRW and ecological receptor ALs. Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions. "Adequate" sensitivity is defined as a reporting limit that is less than an analyte's associated AL, typically less than one-half the AL.

13.3 Summary of Data Quality

LCS, surrogate, field blank, MS, MSD, and field duplicate frequency results were acceptable or did not impact project decisions. Real-duplicate RPD maximums for cobalt, nickel, strontium, and zinc were high but did not affect decisions. Seven nitrate analyses were rejected for exceeding holding times; however, this did not impact project decisions. Compliance with the project quality requirements and RFETS validation goal of 25 percent of all analytical records indicates these data are adequate. If additional V&V information is received, IHSS Group 400-8 records will be updated in the SWD. Data qualified as a result of additional data will be assessed as part of the CRA process. Data collected and used for IHSS Group 400-8 are adequate for decision making.

14.0 CONCLUSION

Results of the accelerated action justify NFAA for this IHSS Group. Justification is based on the following:

- No further accelerated action required based on surface soil data;
- No further accelerated action required based on the SSRS; and
- No further accelerated action required based on the stewardship evaluation.

15.0 REFERENCES

CDPHE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY03 Notification #03-06 Approval Letter, March 11.

DOE, 1992-2003, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

DOE, 1996, Completion Report for the Underground Storage Tanks Source Removal Project, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Order 414.1A, Quality Assurance.

DOE, 2000a, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000b, RFCA Standard Operating Protocol for Facility Disposition, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, RFETS Automated Surface-Water Monitoring Report, Water Year 1997-2000, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado. January.

DOE, 2003b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2003c, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003d, First Quarter RFCA Groundwater Monitoring Report for Calendar Year 2003, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 1994a, Guidance for the Data Quality Objective Process, QA/G-4.

EPA, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012.

EPA, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013.

EPA, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis, QA/G-9.

K-H, 2002a, General Guidelines for Data Verification and Validation, DA-GR01-v2, October.

K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, October.

K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v3, October.

K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v3, October.

K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v3, October.

Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

Appendix A
Correspondence

Appendix B
Project Photographs

Exposed ends of clay pipe that extended north of the southern OPWL manhole. Manhole was west of Building 441.

Open end of clay pipe extending north of southern OPWL manhole. Manhole was west of Building 441.

Northern manhole west of Building 441 with pipe and copper sleeve.

Northern manhole west of Building441 with OPWL pipe that had hole covered by copper sleeve.

Open limestone bed of Tank T-2 below backhoe bucket. West half (underground) of Tank T-3 in foreground, covered east half of Tank T-3 with access covers to right.

Crushed limestone gravel in Tank T-2.

Limestone gravel being removed from Tank T-2.

Limestone gravel from Tank T-2 being placed in IP-1 waste container.

Top half (western side) of Tank T-3 (holding tank) broken open. This part of T-3 was underground. Above ground eastern half with cover and three access chambers to left.

OPWL line (P3) entering wet well of Tank T-2 from the west. Open limestone bed of Tank T-2 visible to right.

OPWL pipe (P3) west of wet well of Tank T-2 removed.

Wet well of Tank T-2 under Jersey barrier (left), open limestone bed of Tank T-2 (middle), and two components of Tank T-3, underground half with top crushed and covered half (right-background).

Wet well of Tank T-2 (left), open limestone bed of Tank T-2 (middle), and two components of Tank T-3, underground half with top crushed (right) and covered half (right-background).

Tank T-2 removed including wet well and limestone bed. Tank T-3 still in place to right.

Tank T-2 removed including wet well and limestone bed. Tank T-3 still in place to right.

Heavily reinforced bottom part of Tank T-3 (holding tank) being broken up.

Excavation after the removal of Tank T-3 (holding tank). Note out of service alarm cable draped across side of excavation.

Excavation after the removal of Tank T-3 (holding tank). Note out of service alarm cable draped across side of excavation.

Lead contaminated soil removed with excavator bucket (marks from bucket teeth can be seen just above the wooden stake. Hole dimensions were approximately 4x4x2 ft.

COMPLETE DATA SET COMPACT DISC
ACCELERATED ACTION AND CHARACTERIZATION DATA