NOTICE

All drawings located at the end of the document.

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DRAFT CLOSEOUT REPORT FOR IHSS GROUP 600-1 (PAC 600-1001)

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DRAFT CLOSEOUT REPORT FOR IHSS GROUP 600-1 (PAC 600-1001)

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( )
Approval letter contained in the Administrative Record.

June 2003

2

TABLE OF CONTENTS

EXECUTIVE SUMMARY E-1
1.0 INTRODUCTION 1
2.0 IHSS GROUP 600-1 ACTIVITIES 3
2.1 Site Characterization 3
2.1.1 PAC 600-1001, Temporary Waste Storage – Building 663 3
2.1.2 Analytical Data – IHSS Group 600-1 3
2.2 Sum of Ratios and Area of Concern 6
2.3 Planned Accelerated Action Description 21
2.3.1 Accelerated Action Objectives 21
2.3.2 Removal Activities 22
2.4 Confirmation Sampling Data 23
2.5 Deviations from the ER RSOP 23
2.6 Waste Management 24
2.7 Site Reclamation 24
2.8 Accelerated Action Goals 24
3.0 POST-REMEDIATION CONDITIONS 36
3.1 Subsurface Soil Risk Screen 36
3.2 Summary 36
4.0 STEWARDSHIP EVALUATION 46
4.1.1 Current Site Conditions 46
4.1.2 Near Term Management Recommendations 46
4.1.3 Long Term Stewardship Recommendations 46
4.1.4 Accelerated Action Stewardship 47
5.0 DATA QUALITY ASSESSMENT 48
5.1 Data Quality Assessment Process 48
5.2 Verification and Validation of Results 49
5.2.1 Accuracy 50
5.2.2 Precision 55
5.2.3 Sensitivity 59
5.3 Summary of Data Quality 59
6.0 REFERENCES 61

3

LIST OF FIGURES

Figure 1 Location Map–IHSS Group 600-1 4
Figure 2 IHSS Group 600-1 5
Figure 3 Location of Pre-Accelerated Action Sample Results Above Detection Limits or Background Means Plus Two Standard Deviations at IHSS Group 600-1 7
Figure 4 Location of Characterization Sampling Results Above Detection Limits or Background Means Plus Two Standard Deviations at IHSS Group 600-1 8
Figure 5 Excavation Area, IHSS Group 600-1 27
Figure 6 Structures and Features Removed at IHSS Group 600-1 28
Figure 7 Confirmation Sampling Results Greater Than Background Means Plus Two Standard Deviations or Method Detection Limits 29
Figure 8 Residual Contamination at IHSS Group 600-1 45

LIST OF TABLES

Table 1 IHSS Group 600-1–Characterization Sampling Specifications 9
Table 2 Background Means Plus Two Standard Deviations or Method Detection Limits 14
Table 3 Surface Soil RFCA Tier I and Tier II Sum of Ratios 21
Table 4 Dates of Accelerated Action Activities 22
Table 5 In-Process Sampling Results Greater Than Background Means Plus Two Standard Deviations or Method Detection Limits Hot Spot Soil Removal 25
Table 6 Confirmation Sampling Results Hot Spot Soil Removal 26
Table 7 Planned versus Actual Sampling 30
Table 8 Waste Characterization Summary 33
Table 9 Residual Contamination at IHSS Group 600-1 37
Table 10 Laboratory Control Sample Evaluation 51
Table 11 Surrogate Recovery Summary 52
Table 12 Field Blank Summary 53
Table 13 Sample Matrix Spike Evaluation 53
Table 14 Sample Matrix Spike Duplicate Evaluation 55
Table 15 Field Duplicate Sample Frequency 57
Table 16 RPD Evaluation 57
Table 17 Validation and Verification Summary 60

LIST OF APPENDICES

Appendix A – Project Photographs
Appendix B – Correspondence

ENCLOSURES

Analytical and QC Data

ACRONYMS

AL	action level
AR	Administrative Record
CAD/ROD	Corrective Action Decision/Record of Decision
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CM	Corrective Measure
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
cu ft	cubic feet
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
dpm	disintegrations per minute
DQA	Data Quality Assessment
DQO	Data Quality Objective
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Procedure
FS	Feasibility Study
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
lbs	pounds
LCS	laboratory control sample
LD	laboratory duplicate
LLW	low-level waste
MDA	Minimum Detectable Activity
MDL	method detection limit
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable
ND	not detected
NFAA	No Further Accelerated Action
NLR	No Longer Representative
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
pCi/g	picocuries per gram
PCOC	potential contaminant of concern
QC	Quality Control
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation

5

RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RI	Remedial Investigation
RISS	Remediation, Industrial D&D, & Site Services
RPD	relative percent difference
RSOP	RFCA Standard Operating Procedure
SAP	Sampling and Analysis Plan
Site	Rocky Flats Environmental Technology Site
SOR	Sum of Ratio
SVOC	semivolatile organic compound
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
VOC	volatile organic compound
V&V	verification and validation
WRW	Wildlife Refuge Worker

EXECUTIVE SUMMARY

This Closeout Report summarizes accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 600-1, PAC 600-1001 – Temporary Waste Storage Building, at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. Activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan, (SAP) (IASAP), IASAP Addendum #IA-02-04, 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 #02-04.

Activities were conducted between August 5 and October 10, 2002, and involved the removal of the Building 662 and 663 slabs and associated concrete-paved areas. Ancillary items removed included a tile drain, electrical cable, and a sewer drain.

The accelerated action also involved soil characterization. Accelerated action analytical results indicated that radionuclides were present at activities greater than RFCA Tier I ALs at one location in the southeastern portion of Building 663. Additionally, benzo(a)pyrene was present at concentrations greater than RFCA Tier II ALs but less than proposed Wildlife Refuge Worker (WRW) ALs and, where available, proposed ecological ALs at three locations near Building 663 and is associated with the asphalt in that area.

Results of the Data Quality Assessment (DQA) conducted confirmed that the data quality objectives (DQO) were attained relative to sampling power (number and types of samples), confidence in decisions (greater than 90%), and the various verification and validation (V&V) criteria applied.

Removal activities were consistent with and contributed to the ER RSOP overall long-term remedial action objectives (RAOs) for RFETS soil. Removal of the concrete slabs 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 because potential sources of contamination were removed or isolated. In addition, best management practices (BMPs) were used during the accelerated action to prevent the spread of contamination during the accelerated action (for example, erosion and dust controls). Air monitoring data during the accelerated action did not indicate any exceedances.

The Subsurface Soil Risk Screen (SSRS) conducted as part of this accelerated action indicates no further action is required. There is groundwater contamination in the area, but there may be multiple sources of this contamination. The groundwater contamination is considered part of the Industrial Area (IA) Plume, which will be further 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. Fencing and signs restricting access will be

posted to 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 radionuclides, metals, volatile organic compounds (VOCs), semivolatile (SVOCs), and polychlorinated biphynels (PCBs) in soils will be analyzed in the Site-Wide Comprehensive Risk Assessment, which is part of the Resource Conservation Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) and Corrective Measures Study/Feasibility Study (CMS/FS) that will be conducted for the Site. The need for and extent of any, more general, long-term stewardship activities will also be analyzed in the RFI/RI and CMS/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 RFETS will ultimately be contained in the Corrective Action Decision/Record of Decision (CAD/ROD), in any post-closure Colorado Hazardous Waste Act (CHWA) permit that may be required, and in any post-RFCA agreement.

No specific long-term stewardship activities are recommended for IHSS Group 600-1 beyond the generally applicable Site requirements that may be imposed on this area in the future, which depend on the final remedy selected. 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, or prohibitions on groundwater pumping in the area of IHSS Group 600-1.

No specific engineering controls or environmental monitoring are anticipated as a result of the conditions remaining at IHSS Group 600-1.

This Closeout Report and associated documentation will be retained as part of the RFETS 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 a No Further Accelerated Action (NFAA). This information and NFAA determination will be documented in the FY03 Historical Release Report (HRR).

8

1.0 INTRODUCTION

This closeout report summarizes characterization and accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 600-1 PAC 600-1001 – Temporary Waste Storage Building, at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. Accelerated action activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (DOE 2001a), IASAP Addendum #IA-02-01 (DOE 2001b), and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2002a). Notification of the planned activities was provided in ER RSOP Notification #02-04 (DOE 2002b), which was approved by the Colorado Department of Public Health and Environment (CDPHE) on June 19, 2002.

Approval of this Closeout Report constitutes regulatory agency concurrence that these IHSS Groups are No Further Accelerated Actions (NFAAs). This information and NFAA determination will be documented in the FY03 Historical Release Report (HRR).

This report contains the information necessary to demonstrate attainment of cleanup objectives and final closure of IHSS Group 600-1. This information includes:

- 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 rational for the action and map of the target remediation area,

  Map of the actual remediation area, including bounds of the excavation, and dates and durations of specific remedial activities,

  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;

- Description of near-term stewardship actions and long-term stewardship recommendations;

- Description of site condition after remediation that includes a map of residual contamination above background plus two standard deviations or method detection limits (MDLs);

- 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 comparison of confirmation data with project data quality objectives (DQOs).

10

2.0 IHSS GROUP 600-1 ACTIVITIES

IHSS Group 600-1 consists of the Potential Area of Concern (PAC) 600-1001 – Temporary Waste Storage - Building 663. The location of IHSS Group 600-1 is shown on Figure 1 and PAC 600-1001 is shown on Figure 2.

2.1 Site Characterization

IHSS Group 600-1 characterization information consists of historical knowledge, previously collected analytical data, and new data. Historical information for IHSS Group 600-1 is presented below. IHSS Group 600-1 analytical data is presented in Section 2.1.5.

2.1.1 PAC 600-1001, Temporary Waste Storage – Building 663

Two temporary buildings were constructed on concrete slabs for use during the initial Plant construction in the early 1950s. These buildings were located where Building 662 and Building 663 were located. The wooden structures were removed prior to 1954; however, the concrete slabs remained. The slabs from Buildings 662 and 663, as well as the area around them, were used for storage purposes.

In April 1954, it was proposed that the Building 663 slab be used for temporary storage of noncombustible waste awaiting disposal. The slab was thought to be located east of Building 334 and Building 444 (DOE 1992). Most of the waste stored at this slab came from these two buildings.

Storage operations began in May 1954, when 302 drums of graphite and 49 drums of liquid waste were placed on the Building 663 slab. Waste coolant drums were also stored on the slab. In November 1954, all of the drums were removed from the slab; however, storage at the area later resumed.

The area was found to be an advantageous loading area, and the slab east of Building 663 was connected to a loading facility. The northern end of the loading facility was reinforced and refinished with concrete in October 1958.

On October 15, 1960, a waste storage building was erected on the Building 663 slab. Accumulated drums of waste from the production buildings were moved to the building. In November 1962, drums and boxes of waste from Buildings 771 and 774 were moved to the western side of Building 663 for outside storage.

Documented releases of radionuclides, oil, coolant, perclene, and acids that occurred at these storage areas are described in the HRR (DOE 1992 and Appendix C of the IASAP (DOE 2001

2.1.2 Analytical Data – IHSS Group 600-1

As described in IASAP Addendum #IA-02-01 (DOE 2001b), potential contaminants of concern (PCOCs) at IHSS Group 600-1 were determined based on historical information (DOE 1998 – 2001) and data collected during previous studies (DOE 2001a, DOE 2000).

These pre-accelerated action data, greater than background plus two standard deviations or MDLs, along with RFCA Tier I and Tier II Action Level (AL) values are shown on Figure 3. Results from previous sampling and analysis of surface and subsurface soils at IHSS Group 600-1 indicated that radionuclides, metals, and semivolatile organic compounds (SVOCs) were present in surface soil and radionuclides, metals, SVOCs, and volatile organic compounds (VOCs) were present in subsurface soil. Proposed sampling locations and specifications are listed in Table 1.

Accelerated action sample locations and analytical results associated with IHSS Group 600-1 are presented on Figure 4 and in Table 2. Only results greater than background mean plus two standard deviations or reporting limits are shown. The data indicated that radionuclides were present at activities greater than RFCA Tier I ALs at one location in the southeastern portion of Building 663. Additionally, benzo(a)pyrene was present at concentrations greater than RFCA Tier II ALs but less than proposed Wildlife Refuge Worker (WRW) ALs and, where available, proposed ecological ALs at three locations near Building 663 and is associated with the asphalt in that area.

2.2 Sum of Ratios and Area of Concern

RFCA Tier II and Tier I sum of ratios (SORs) were calculated to determine whether there were RFCA AL exceedances for IHSS Group 600-1 locations. SOR calculations were based on accelerated action analytical data and the following list of contaminants of concern (COCs):

- Radionuclides (americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238);
- Metals (arsenic, copper, mercury, lead, etc.); and
- Organics (VOCs and SVOCs).

The COCs are based on data that exceed background mean plus two standard deviations or MDLs. Metals and organics were grouped together for nonradionuclide SOR calculations. Plutonium, americium, and uranium were grouped together for radionuclide SOR calculations. Table 3 presents the SORs for surface soil. The radionuclide Tier I and Tier II SORs for the sampling location in the southeastern portion of Building 663 were 5.87 and 33.34 respectively. Two nonradionuclide SORs were greater than the threshold value of 1 at the three locations with benzo(a)pyrene at concentrations greater than the RFCA Tier II AL. All other SORs were below the Tier II threshold value of 1. SORs were calculated for all locations with analytical results greater than background mean plus two standard deviations or reporting limits.

Table 1
IHSS Group 600-1–Characterization Sampling Specifications

Location Code	Easting	Northing	Media	Depth Interval (ft)	Analyte	Onsite Laboratory Method	Offsite Laboratory Method
CB37-001	2083070.72	748936.48	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-001	2083070.72	748936.48	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-002	2083102.00	748954.29	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-002	2083102.00	748954.29	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-003	2083070.51	748900.48	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-003	2083070.51	748900.48	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-004	2083101.79	748918.30	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-004	2083101.79	748918.30	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-005	2083133.07	748936.11	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-005	2083133.07	748936.11	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-006	2083070.29	748864.48	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-006	2083070.29	748864.48	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-007	2083101.58	748882.30	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-007	2083101.58	748882.30	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-008	2083132.86	748900.11	Surface Soil	0-0.5'	Radionuclides	HPGe	Alpha Spec

Location Code	Easting	Northing	Media	Depth Interval (ft)	Analyte	Onsite Laboratory Method	Offsite Laboratory Method
					SVOCs	NA	8270
CB37-008	2083132.86	748900.11	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-009	2083070.08	748828.48	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-009	2083070.08	748828.48	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-010	2083101.36	748846.30	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-010	2083101.36	748846.30	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-011	2083132.65	748864.11	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-011	2083132.65	748864.11	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB37-012	2083132.43	748828.11	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB37-012	2083132.43	748828.11	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB38-001	2083070.94	748972.48	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB38-001	2083070.94	748972.48	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CB38-002	2083133.29	748972.11	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CB38-002	2083133.29	748972.11	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-001	2083164.36	748953.92	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-001	2083164.36	748953.92	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-002	2083164.14	748917.93	Surface Soil	0-0.5'	Radionuclides	HPGe	Alpha Spec

Location Code	Easting	Northing	Media	Depth Interval (ft)	Analyte	Onsite Laboratory Method	Offsite Laboratory Method
					SVOCs	NA	8270
CC37-002	2083164.14	748917.93	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-003	2083195.43	748935.74	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-003	2083195.43	748935.74	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-004	2083226.71	748953.56	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-004	2083226.71	748953.56	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-005	2083163.93	748881.93	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-005	2083163.93	748881.93	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-006	2083195.21	748899.74	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-006	2083195.21	748899.74	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-007	2083226.50	748917.56	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-007	2083226.50	748917.56	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-008	2083257.78	748935.37	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-008	2083257.78	748935.37	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-009	2083289.06	748953.19	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-009	2083289.06	748953.19	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-010	2083163.72	748845.93	Surface Soil	0-0.5'	Radionuclides	HPGe	Alpha Spec

Location Code	Easting	Northing	Media	Depth Interval (ft)	Analyte	Onsite Laboratory Method	Offsite Laboratory Method
					SVOCs	NA	8270
CC37-010	2083163.72	748845.93	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-011	2083195.00	748863.74	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-011	2083195.00	748863.74	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-012	2083226.28	748881.56	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-012	2083226.28	748881.56	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-013	2083257.57	748899.37	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-013	2083257.57	748899.37	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-014	2083288.85	748917.19	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-014	2083288.85	748917.19	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-015	2083194.79	748827.74	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-015	2083194.79	748827.74	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-016	2083226.07	748845.56	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-016	2083226.07	748845.56	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-017	2083257.35	748863.37	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-017	2083257.35	748863.37	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-018	2083288.64	748881.19	Surface Soil	0-0.5'	Radionuclides	HPGe	Alpha Spec

Location Code	Easting	Northing	Media	Depth Interval (ft)	Analyte	Onsite Laboratory Method	Offsite Laboratory Method
					SVOCs	NA	8270
CC37-018	2083288.64	748881.19	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-019	2083257.14	748827.37	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-019	2083257.14	748827.37	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-020	2083288.42	748845.19	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-020	2083288.42	748845.19	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-021	2083319.71	748863.00	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-021	2083319.71	748863.00	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC37-022	2083319.49	748827.00	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC37-022	2083319.49	748827.00	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC38-001	2083195.64	748971.74	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC38-001	2083195.64	748971.74	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC38-002	2083257.99	748971.37	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC38-002	2083257.99	748971.37	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260
CC38-003	2083320.35	748971.00	Surface Soil	0-0.5'	Radionuclides SVOCs	HPGe NA	Alpha Spec 8270
CC38-003	2083320.35	748971.00	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	HPGE NA 8260	8260 8270 8260

Table 2
Background Means Plus Two Standard Deviations or Method Detection Limits

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
600-1	PAC 600-1001 – Temporary Waste Storage - Building 663	CB37-002	Benzo(a)anthracene	0.0	0.5	83	41	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	110	99	NA	61,400.00	614.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	99	98	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	110	56	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	220	89	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	75	51	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	200	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-003	Acenapthene	0.0	0.5	110	49	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	130	83	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	380	42	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	410	100	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	350	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	390	99	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	430	57	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	1100	90	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	240	51	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	810	43	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-005	Benzo(a)anthracene	0.0	0.5	66	40	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	100	96	NA	61,400.00	614.00	ug/kg
			Chrysene	0.0	0.5	85	54	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	140	86	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	74	49	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	140	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-006	Acenapthene	0.0	0.5	54	47	NA	115,000,000.00	115,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	230	40	NA	614,000.00	6,140.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Benzo(a)pyrene	0.0	0.5	250	96	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	210	100	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	220	95	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	250	55	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	70	48	NA	61,400.00	614.00	ug/kg
			Fluoranthene	0.0	0.5	630	86	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	150	49	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	500	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-006	Benzene	0.5	2.5	230		NA	1,410.00	14.10	ug/kg
			Benzo(a)anthracene	0.5	2.5	49	46	NA	160,000.00	1,600.00	ug/kg
			Fluoranthene	0.5	2.5	120	98	NA	537,000,000.00	5,370,000.00	ug/kg
			Pyrene	0.5	2.5	94	47	NA	397,000,000.00	3,970,000.00	ug/kg
		CB37-009	Acenapthene	0.0	0.5	100	48	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	170	82	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	400	41	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	400	99	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	330	100	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	350	98	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	430	56	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	92	49	NA	61,400.00	614.00	ug/kg
			Fluoranthene	0.0	0.5	1200	88	NA	76,800,000.00	76,800,000.00	ug/kg
			Fluorene	0.0	0.5	81	80	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	250	50	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	920	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-010	Benzo(a)anthracene	0.0	0.5	55	39	NA	614,000.00	6,140.00	ug/kg
			Chrysene	0.0	0.5	70	54	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	110	85	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	100	40	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-011	Benzo(a)anthracene	0.0	0.5	44	41	NA	614,000.00	6,140.00	ug/kg
			Fluoranthene	0.0	0.5	93	89	NA	76,800,000.00	76,800,000.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Pyrene	0.0	0.5	81	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-013	Benzo(a)anthracene	0.5	2.5	64	45	NA	160,000.00	1,600.00	ug/kg
			Bis(2-ethylhexyl)phthalate	0.5	2.5	300	80	NA	311,000,000.00	3,110,000.00	ug/kg
			Chrysene	0.5	2.5	81	62	NA	16,000,000.00	160,000.00	ug/kg
			Fluoranthene	0.5	2.5	160	97	NA	537,000,000.00	5,370,000.00	ug/kg
			Pyrene	0.5	2.5	140	46	NA	397,000,000.00	3,970,000.00	ug/kg
		CB37-019	Acenapthene	0.0	0.5	150	51	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	150	87	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	330	43	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	360	100	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	270	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	310	100	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	390	59	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	120	52	NA	61,400.00	614.00	ug/kg
			Fluoranthene	0.0	0.5	920	94	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	270	53	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	790	45	NA	57,600,000.00	57,600,000.00	ug/kg
		CB38-001	Benzo(a)anthracene	0.0	0.5	100	40	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	120	96	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	110	100	NA	614,000.00	6,140.00	ug/kg
			Chrysene	0.0	0.5	120	54	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	230	86	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	92	49	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	210	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CB38-002	2-Methylnaphthalene	0.0	0.5	19000	310	NA	76,800,000.00	76,800,000.00	ug/kg
			Anthracene	0.0	0.5	4800	410	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	5400	210	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	4500	500	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	2000	530	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	1200	490	NA	6,140,000.00	61,400.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Chrysene	0.0	0.5	9100	280	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	1800	250	NA	61,400.00	614.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	1500	250	NA	614,000.00	6,140.00	ug/kg
			Naphthalene	0.0	0.5	8900	370	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	12000	210	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-001	Bis(2-ethylhexyl)phthalate	0.0	0.5	250	73	NA	32,000,000.00	320,000.00	ug/kg
		CC37-003	Acenapthene	0.0	0.5	75	49	NA	115,000,000.00	115,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	190	42	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	200	100	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	150	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	180	99	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	220	57	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	520	89	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	130	51	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	460	43	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-004	Benzoic acid	0	0.5	1100	370	NA	1,000,000,000.00	1,000,000,000.00	ug/kg
			Anthracene	0.5	2.5	220	70	NA	1,000,000,000.00	11,200.00	ug/kg
			Fluoranthene	0.5	2.5	230	42	NA	537,000,000.00	5,370,000.00	ug/kg
			Pyrene	0.5	2.5	220	61	NA	397,000,000.00	3,970,000.00	ug/kg
		CC37-006	Acenapthene	0.0	0.5	320	50	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	480	84	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	860	42	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	740	100	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	590	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	710	100	NA	6,140,000.00	61,400.00	ug/kg
			Bis(2-ethylhexyl)phthalate	0.0	0.5	150	74	NA	32,000,000.00	320,000.00	ug/kg
			Chrysene	0.0	0.5	920	57	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	2600	90	NA	76,800,000.00	76,800,000.00	ug/kg
			Fluorene	0.0	0.5	270	82	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	450	52	NA	614,000.00	6,140.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Pyrene	0.0	0.5	2100	43	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-008	Benzo(a)anthracene	0.0	0.5	150	40	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	180	97	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	130	100	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	160	96	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	180	55	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	390	86	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	120	49	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	360	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-009	Pyrene	0.0	0.5	77	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-012	Benzo(a)anthracene	0.0	0.5	130	47	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	150	61	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	130	76	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	130	82	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	150	41	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	370	47	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	94	53	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	340	67	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-014	Bis(2-ethylhexyl)phthalate	0.0	0.5	140	82	NA	32,000,000.00	320,000.00	ug/kg
			Butyl benzylphthalate	0.0	0.5	310	75	NA	384,000,000.00	384,000,000.00	ug/kg
			Chrysene	0.0	0.5	41	40	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	72	46	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	73	65	NA	57,600,000.00	57,600,000.00	ug/kg
			Methylene chloride	0.5	2.5	1.9	0.92	NA	578.00	5.78	ug/kg
		CC37-016	2-Methylnaphthalene	0.0	0.5	130	41	NA	76,800,000.00	76,800,000.00	ug/kg
			Acenapthene	0.0	0.5	590	52	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	630	75	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	1100	45	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	1200	59	NA	61,400.00	614.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Benzo(b)fluoranthene	0.0	0.5	950	73	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	1100	79	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	1200	39	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	340	72	NA	61,400.00	614.00	ug/kg
			Dibenzofuran	0.0	0.5	220	58	NA	7,680,000.00	7,680,000.00	ug/kg
			Fluoranthene	0.0	0.5	3000	45	NA	76,800,000.00	76,800,000.00	ug/kg
			Fluorene	0.0	0.5	430	63	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	780	51	NA	614,000.00	6,140.00	ug/kg
			Naphthalene	0.0	0.5	380	49	NA	76,800,000.00	76,800,000.00	ug/kg
			Pentachlorophenol	0.0	0.5	410	74	NA	14,900,000.00	37,400.00	ug/kg
			Pyrene	0.0	0.5	2600	65	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-018	Benzo(a)anthracene	0.0	0.5	58	41	NA	614,000.00	6,140.00	ug/kg
			Chrysene	0.0	0.5	65	56	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	150	88	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	100	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-020	Pyrene	0.0	0.5	100	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-021	Pyrene	0.5	1	44	44	NA	397,000,000.00	3,970,000.00	ug/kg
			Benzo(a)anthracene	1	3	52	48	NA	160,000.00	1,600.00	ug/kg
			Chrysene	1	3	130	66	NA	16,000,000.00	160,000.00	ug/kg
			Pyrene	1	3	77	49	NA	397,000,000.00	3,970,000.00	ug/kg
		CC37-022	Chrysene	1	3	93	60	NA	16,000,000.00	160,000.00	ug/kg
		CC37-023	Methylene chloride	0.5	2.5	1.8	0.87	NA	578.00	5.78	ug/kg
		CC37-024	Butyl benzylphthalate	0.0	0.5	310	70	NA	384,000,000.00	384,000,000.00	ug/kg
			Methylene chloride	0.5	2.5	2.1	0.96	NA	578.00	5.78	ug/kg
		CC38-001	Benzo(a)anthracene	0.0	0.5	150	41	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	170	99	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	140	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	150	98	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	190	56	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	370	89	NA	76,800,000.00	76,800,000.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Indeno(1,2,3-cd)pyrene	0.0	0.5	120	51	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	360	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC38-002	Benzo(a)anthracene	0.0	0.5	55	41	NA	614,000.00	6,140.00	ug/kg
			Chrysene	0.0	0.5	70	55	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	140	87	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	140	42	NA	57,600,000.00	57,600,000.00	ug/kg
		TBD	Americium-241	0.0	0.5	720	4	NA	215.00	38.00	ug/kg
		TBD	Plutonium-239/240	0.0	0.5	3600	0	NA	1,430.00	252.00	ug/kg

Table 3
Surface Soil RFCA Tier I and Tier II Sum of Ratios

Location	Easting	Northing	Tier I SOR	Tier II SOR
CB38-001	2083071	748972.5	0.00	0.24
CB37-003	2083070	748900.4	0.01	0.83
CB37-004	2083102	748918.4	NA	NA
CB37-002	2083102	748954.3	0.00	0.21
CB38-002	2083133	748972.2	0.12	11.75
CB37-005	2083133	748936	0.00	0.19
CC37-001	2083164	748954	0.00	0.00
CC38-001	2083196	748971.7	0.00	0.35
CC37-003	2083195	748935.7	0.00	0.41
CC37-006	2083195	748899.7	0.02	1.53
CC37-008	2083258	748935.4	0.00	0.36
CB37-019	2083257	748827.3	0.01	0.93
CC38-002	2083258	748971.4	0.00	0.01
CB37-009	2083070	748828.4	0.01	0.97
CB37-011	2083133	748864.1	0.00	0.01
CB37-006	2083070	748864.4	0.01	0.62
CC38-003	2083320	748970.9	NA	NA
CC37-009	2083289	748953.2	0.00	0.00
CC37-018	2083289	748881.1	0.00	0.01
CC37-020	2083288	748845.3	0.00	0.00
CB37-010	2083101	748846.3	0.00	0.01
CC37-024	2083320	748935	0.00	0.00
CC37-014	2083289	748917.2	0.00	0.00
CC37-004	2083101.79	748918.30	0.00	0.00
CC37-007	2083101.58	748882.30	NA	NA
CC37-012	2083132.43	748828.11	0.00	0.30
CC37-016	2083226	748845.5	0.03	3.00
TBD	2083245	748862.3	5.87	33.23

2.3 Planned Accelerated Action Description

Accelerated action activities are described below.

2.3.1 Accelerated Action Objectives

Accelerated action objectives were developed and described in ER RSOP Notification #02-04 (DOE 2002b). The accelerated action objectives for IHSS Group 600-1 included the following:

- Remove the concrete slabs (if not removed by Remediation, Industrial Decontamination and Decommissioning [D&D], & Site Services [RISS] Facility D&D) and recycle in accordance with the RSOP for Recycling Concrete (DOE 1999), or dispose of offsite;
- Remove sanitary sewer drains (if not removed by RISS Facility D&D);

29

- Remove structures and piping within 3 feet of current grade (if not removed by RISS Facility D&D);
- Remove soil with contaminant concentrations above RFCA Tier I ALs ;
- Remove contaminated soil to below RFCA Tier I ALs if indicated through the stewardship evaluation (Section 2.4); and
- Collect confirmation samples in accordance with the Industrial Area Sampling and Analysis Plan (IASAP) (DOE 2001).

Remediation activities were conducted between July 18, 2002 and October 10, 2002. Start and end dates of significant activities are listed in Table 4

Table 4
Dates of Accelerated Action Activities

Activity	Start Date	End Date	Duration
Characterization Sampling	August 5, 2002	September 20, 2002	46 Days
Removal Activities	July 18, 2002	October 10, 2002	85 Days
Confirmation Sampling	September 16, 2002	October 10, 2002	24 Days
Backfill Excavations	October 10, 2002	October 10, 2002	1 Day

Photographs of site activities are provided in Appendix A.

2.3.2 Removal Activities

ER RSOP Notification #02-04 accelerated action project objectives for IHSS Group 600-1 were achieved through the following:

- The Buildings 662 and 663 and several other concrete slabs were removed;
- Sanitary sewer drains, electrical conduit and other utility components, and a presumed septic system were removed;
- Soil with contaminant concentrations greater than RFCA Tier I and WRW ALs was removed; and
- Confirmation samples were collected in accordance with the IASAP (DOE 2001).

These removal activities are described below. The approximate location of structures and other features removed at IHSS Group 600-1 is shown in Figures 5 and 6.

Remove Concrete Slabs and Soil

The Building 662 and Building 663 concrete slabs as well as two slabs east of IHSS Group 600-1 and several small slabs west of Building 663 were removed. The east slabs were broken up using a hydraulic hammer and the concrete was recycled in accordance with the RSOP for Recycling Concrete (DOE 1999). The Building 662 slab and footers were broken up using a hydraulic hammer. The concrete slab pieces were turned over and surveyed to determine if

30

radionuclide contamination was present. The Building 662 concrete was disposed of offsite at the Erie Landfill. The Building 663 slab was saw cut into approximately 4 foot by 6 foot sections and the bottom of the slab was surveyed. Concrete disposal is described in Section 2.6.

During Building 663 slab removal, a southwest/northeast trending crack was discovered in the southeastern corner of the slab. Radiological surveys of the crack indicated surface contamination. This portion of the slab was turned over and surveyed, surveys indicated that the bottom of the slab and the soil beneath the slab were contaminated. Measurements showed 224,000 disintegrations per minute (dpm) fixed alpha contamination and 3,196 dpm removable alpha contamination. A fixative was applied to the contaminated area to prevent the spread of contamination. The soil beneath the crack was sampled, the fixative applied, and the area covered with plastic. Soil analytical results indicated that americium was present at an activity of 720 picocuries per gram (pCi/g) and plutonium was present at an activity of 3,600 pCi/g.

Soil at this location was excavated to a depth of 4.5 feet over an approximately 20 feet by 30 feet and in-process samples were collected and analyzed. The results of the in-process analyses are listed in Table 5. Confirmation samples were collected at this location after accelerated action objectives were achieved. The excavated area is shown on Figure 5.

Removal of Structures and Piping

All structures and piping beneath Building 662 and Building 663 slabs were removed. A sanitary drain with rusted base was removed from beneath Building 662 however, there were no additional pipes associated with this drain. Electrical conduit and wires were removed from beneath the Building 662 slab and a series of electrical utilities adjacent to Building 663 were removed. The presumed septic system (tile drain) beneath the western east slab was located and removed.

2.4 Confirmation Sampling Data

Confirmation sampling and analysis was conducted, after excavation of contaminated soil and before backfilling, to verify accelerated action goals. Confirmation sampling locations were developed as part of the consultative process. Confirmation sampling locations and results greater than background means and two standard deviations or reporting limits are shown on Figure 7 and in Table 6. Confirmation sampling results indicate that all contaminant concentrations are less than RFCA Tier II ALs and proposed WRW and ecological ALs. The complete data set is in Appendix B.

Confirmation sampling location SOR calculations were based on radionuclides (americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238). Plutonium, americium, and uranium were grouped together for radionuclide SOR calculations. Tier II SOR calculations for radionuclides are less than the threshold value of 1 at all confirmation sampling locations. The RFCA Tier II SOR is 0.02713 at location CC37-CC04 and is 0.139173 at location CC37-CC06.

2.5 Deviations from the ER RSOP

Subsurface soil samples were collected in the excavation area. Based on the consultative process, subsurface soil samples in other areas were not collected. Table 7 lists planned versus actual sampling locations.

31

2.6 Waste Management

Waste from the IHSS Group 600-1 accelerated action consisted of concrete, soil, and electrical debris. Clean concrete was segregated and recycled in accordance with the RSOP for Concrete Recycling (DOE 1999a) or sent to the Erie Landfill. Contaminated concrete was loaded into metal waste boxes for disposal as low-level waste. Electrical debris was placed in metal waste containers for disposal as low-level waste. Approximately 23,120 cubic feet (cu ft) of low level waste (LLW), 7,803 cu ft of sanitary waste, and 11,194.76 cu ft of recycled concrete were generated during this accelerated action. Waste types, volumes, and disposition are presented in Table 8.

Excavated soil was temporarily stockpiled near the excavations. Samples were collected from the soil stockpiles to determine the final disposition of the excavated soil.

2.7 Site Reclamation

All excavated areas were backfilled after confirmation sampling results were received and discussed with regulatory agencies through the consultative process. Clean backfill from adjacent clean areas was used. Reseeding at IHSS Group 600-1 will be delayed because of current drought conditions.

2.8 Accelerated Action Goals

ER RSOP Notification #02-04 accelerated action project objectives were achieved through the following:

- Removal of concrete slabs and associated structures; and
- Removal of all soil with contaminant concentrations greater than RFCA Tier I ALs.

Removal activities were consistent with and contributed to the ER RSOP overall long-term remedial action objectives (RAOs) for RFETS soil. This contribution is described below.

RAO 1: Provide a remedy consistent with the RFETS goal of protection of human health and the environment. Removal of concrete slabs, all structures, and all soil with contaminant concentrations greater than RFCA Tier I ALs contributed to the protection of human health and the environment because potential sources of contamination were removed.

RAO 2: Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls. Removal of concrete slabs, all structures, and all soil with contaminant concentrations greater than RFCA Tier I ALs minimizes the need for long-term maintenance and institutional or engineering controls because potential sources of contamination were removed.

RAO 3: Minimize the spread of contaminants during implementation of accelerated actions. Best management practices were used to prevent the spread of contaminants during the accelerated action. Air monitoring data during the accelerated action did not indicate any exceedances.

Table 5
In-Process Sampling Results Greater Than Background Means Plus Two Standard Deviations or Method Detection Limits
Hot Spot Soil Removal

Location Code	Analyte	Depth Start (feet)	Depth End (feet)	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
663 H.S. CONF. #2	Americium-241	2	2.2	9.9	4	0.02	209.00	38.00	pCi/g
663 H.S. CONF. #1	Americium-241	2	2.2	190	4	0.02	209.00	38.00	pCi/g
CC37-CC01	Barium	3	3	515	150	289.38	133,000.00	133,000.00	mg/kg
	Copper	3	3	56.7	300	38.21	71,100.00	71,100.00	mg/kg
	Nickel	3	3	63.5	60	62.21	38,400.00	38,400.00	mg/kg
CC37-CC02	Arsenic	3	3	13.4	25	13.14	299.00	2.99	mg/kg
	Barium	3	3	465	150	289.38	133,000.00	133,000.00	mg/kg
	Copper	3	3	50.9	300	38.21	71,100.00	71,100.00	mg/kg
	Americium-241	3	3	240	4	0.02	209.00	38.00	pCi/g
CC37-CC04	Plutonium-239/240	4.5	4.5	3.9		0.02	1,090.00	252.00	pCi/g
	Americium-241	4.5	4.5	0.497		0.02	209.00	38.00	pCi/g
CC37-CC06	Plutonium-239/240	4.5	4.5	17.1		0.02	1,090.00	252.00	pCi/g
	Americium-241	4.5	4.5	2.71		0.02	209.00	38.00	pCi/g
	Americium-241	4.5	4.5	5.4		4.00	209.00	38.00	pCi/g

Table 6
Confirmation Sampling Results
Hot Spot Soil Removal

Location Code	Easting	Northing	Analyte	Depth (feet)	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
CC37-CC04	2083241.548	748862.089	Americium-241	4.5	0.473	0.188	0.02	209.00	38.00	pCi/g
			Plutonium239/240		3.70	0.118	0.02	1,090.00	252.00	pCi/g
			Uranium-234		0.464	0.110	2.64	1,738.00	307.00	pCi/g
			Uranium-235		ND	0.125	0.12	113.00	24.00	pCi/g
			Uranium -238		0.625	0.110	1.49	506.00	103.00	pCi/g
CC37-CC06	2083241.321	748860.621	Americium-241	4.5	2.71	0.281	0.02	209.00	38.00	pCi/g
			Plutonium239/240		17.1	0.0814	0.02	1,090.00	252.00	pCi/g
			Uranium-234		0.267	0.125	2.64	1,738.00	307.00	pCi/g
			Uranium-235		ND	0.158	0.12	113.00	24.00	pCi/g
			Uranium -238		0.525	0.169	1.49	506.00	103.00	pCi/g

Table 7
Planned versus Actual Sampling

Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Media	Depth Interval (ft)	Analyte	Comments
CB37-001	2083070.72	748936.48	2083070.703	748936.5	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-002	2083102.00	748954.29	2083101.927	748954.3	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-003	2083070.51	748900.48	2083070.45	748900.4	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-004	2083101.79	748918.30	2083101.798	748918.4	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-005	2083133.07	748936.11	2083132.953	748936.1	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-006	2083070.29	748864.48	2083070.267	748864.4	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-007	2083101.58	748882.30	2083101.543	748882.3	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-008	2083132.86	748900.11	2083132.884	748900.1	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-009	2083070.08	748828.48	2083070.063	748828.4	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-010	2083101.36	748846.30	2083101.36	748846.3	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-011	2083132.65	748864.11	2083132.534	748864.1	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB37-012	2083132.43	748828.11	2083132.416	748828.2	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB38-001	2083070.94	748972.48	2083070.887	748972.5	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CB38-002	2083133.29	748972.11	2083133.285	748972.2	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-001	2083164.36	748953.92	2083164.421	748954	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-002	2083164.14	748917.93	2083164.257	748917.9	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-003	2083195.43	748935.74	2083195.43	748935.7	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-004	2083226.71	748953.56	2083227	748953.56	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-005	2083163.93	748881.93	2083163.904	748882	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-006	2083195.21	748899.74	2083195.169	748899.7	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-007	2083226.50	748917.56	2083226.5	748917.56	Surface Soil	0-0.5'	Radionuclides	No significant change

Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Media	Depth Interval (ft)	Analyte	Comments
							SVOCs	
CC37-008	2083257.78	748935.37	2083257.847	748935.4	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-009	2083289.06	748953.19	2083289.107	748953.2	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-010	2083163.72	748845.93	2083163.717	748845.9	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-011	2083195.00	748863.74	2083194.969	748863.7	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-012	2083226.28	748881.56	2083226.28	748881.56	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-013	2083257.57	748899.37	2083257.501	748899.422	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-014	2083288.85	748917.19	2083288.85	748917.2	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-015	2083194.79	748827.74	2083194.735	748827.8	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-016	2083226.07	748845.56	2083226.004	748845.5	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-017	2083257.35	748863.37	2083257.35	748863.37	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-018	2083288.64	748881.19	2083289	748881.1	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-019	2083257.14	748827.37	2083257.107	748827.311	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-020	2083288.42	748845.19	2083288	748845.3	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-021	2083319.71	748863.00	2083320	748863	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-022	2083319.49	748827.00	2083325	748821.7	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC37-023			2083319	748899	Surface Soil	0-0.5'	Radionuclides SVOCs	Not in original sampling plan, additional sample required
CC37-024			2083320	748935	Surface Soil	0-0.5'	Radionuclides SVOCs	Not in original sampling plan, additional sample required.
CC37-CC01			2083244	748860.6	Subsurface Soil	3'	Radionuclides Metals	Confirmation Sample
CC37-CC02			2083240	748860.8	Subsurface Soil	3'	Radionuclides Metals	Confirmation Sample
CC38-001	2083195.64	748971.74	2083196	748971.7	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC38-002	2083257.99	748971.37	2083258	748971.4	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change
CC38-003	2083320.35	748971.00	2083320	748970.9	Surface Soil	0-0.5'	Radionuclides SVOCs	No significant change

Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Media	Depth Interval (ft)	Analyte	Comments
CC38-003	2083320.35	748971.00	2083320	748970.9	Subsurface Soil	.5'-2.5'	Radionuclides SVOCs VOCs	No significant change
Most Elevated Spot			2083245	748862.3	Subsurface Soil	0'-1'	Radionuclides Metals VOCs	Not in original plan – In process sample
Soil that had been moved from most elevated spot			2083224	748852.6	Subsurface Soil	0'-1'	Radionuclides Metals VOCs	Not in original plan – In process sample
TBD			2083245	748862.3	Surface Soil	0'-0.5'	Radionuclides	Not in original plan sample beneath concrete
663 Hot Spot. Confirmation 1			2083245	748862.3	Subsurface Soil	0'-1.33'	SVOC	Not in original plan – In –process sample
663 Hot Spot Confirmation 2			2083224	748852.6	Subsurface Soil	0'-1'	SVOC	Not in original plan – In-process sample

Table 8
Waste Characterization Summary

Container Number	Extended Number	Container Type	Volume (cu.ft.)	Waste Type	Gross Weight (lbs)	Status	IDC	Waste Codes	Disposition
X30490	662300001	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30491	662300002	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30476	662300003	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30482	662300004	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30399	662300005	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30477	662300006	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30417	662300019	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30418	662300020	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30386	662300015	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30416	662300018	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30415	662300017	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30387	662300016	CST	1190	LLW	NA	Full and sealed	5001	NA	Transferred to Material Stewardship

Container Number	Extended Number	Container Type	Volume (cu.ft.)	Waste Type	Gross Weight (lbs)	Status	IDC	Waste Codes	Disposition
X30398	662300022	CST	1190	LLW	NA	Full and sealed	5001	NA	Transferred to Material Stewardship
X30478	662300023	CST	1190	LLW	NA	Sealed	5001	NA	Transferred to Material Stewardship
X30597	662300025	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30596	662300024	CST	1190	LLW	NA	Foamed and sealed	5001	NA	Transferred to Material Stewardship
X30412	662300027	CST	1190	LLW	NA	Sealed	5001	NA	Transferred to Material Stewardship
X30413	662300028	CST	1190	LLW	NA	Sealed	5001	NA	Transferred to Material Stewardship
L00869	662300033	L88	264	LLW	NA	Sealed	323	NA	Transferred to Material Stewardship
B03967 crate 2	662300007	IP2	106	LLW	5800	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03969 crate 3	662300008	IP2	106	LLW	5960	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03970 crate 1	662300009	IP2	106	LLW	5460	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03962 crate 7	662300010	IP2	106	LLW	5760	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03968 crate 6	662300011	IP2	106	LLW	5740	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03904 crate 5	662300012	IP2	106	LLW	5760	Closed and weighed	0323	NA	Transferred to Material Stewardship

Container Number	Extended Number	Container Type	Volume (cu.ft.)	Waste Type	Gross Weight (lbs)	Status	IDC	Waste Codes	Disposition
B03903 crate 4	662300013	IP2	106	LLW	5620	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03901 crate 8	662300014	IP2	106	LLW	4780	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03965	662300029	IP2	106	LLW	5380	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03966	662300030	IP2	106	LLW	5740	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03902	662300031	IP2	106	LLW	5800	Closed and weighed	0323	NA	Transferred to Material Stewardship
B02231	662300032	ST90	90	LLW	5420	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03143	622300034	ST90	90	LLW	1220	Closed and weighed	0323	NA	Transferred to Material Stewardship
B03144	622300035	ST90	90	LLW	2240	Closed and weighed	0323	NA	Transferred to Material Stewardship
Sanitary	NA	End Dump	NA	Concrete	NA	Complete	NA	NA	289 cy taken to landfill
Recyle	NA	End Dump	NA	Concrete	NA		NA	NA	11,193 cu ft recycled at the 980 pile

3.0 POST-REMEDIATION CONDITIONS

- Residual contaminant concentrations, consisting of characterization and confirmation sampling locations, and backfill greater than background plus two standard deviations or MDLs at IHSS Group 600-1 are presented in Table 9 and shown on Figure 8.

3.1 Subsurface Soil Risk Screen

Screen 1 – Are contaminant of concern (COC) concentrations below RFCA Table 3 WRW ALs?
Yes, all COC concentrations are less than Table 3 ALs for the WRW. (Screens 2 and 3 are bypassed.)

Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause an exceedance of surface water standards?
Migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by COCs from IHSS Group 600-1. Contaminant migration via erosion is unlikely because this IHSS Group is located in a flat-lying area not prone to landslides or erosion (Figure 1, proposed RFCA Modification [DOE, et al 2002]).

Groundwater monitoring results from Well P313589, south of the site, indicate concentrations of several analytes above RFCA Tier II ALs. Uranium-233/234 and uranium-238 concentrations are greater than RFCA Tier II ALs. Additionally, nickel concentrations exceeded the RFCA Tier II AL during the 1st quarter of 2001, however, they have been consistently below the RFCA Tier II AL since 1996 (DOE 2001b).

Neither uranium nor nickel were found in subsurface soil in concentrations greater than background plus two standard deviations.

Screen 5 – Are COC concentrations below the Table 3 Soil Action Levels for ecological receptors?

Yes, all COC concentrations are less than the Table 3 Soil Action Levels for ecological receptors.

3.2 Summary

Additional removal actions beyond ER RSOP Notification # 02-04 accelerated action goals for IHSS Group 600-1(DOE 2002b) were not required because of the following:

- Residual radionuclide activities in subsurface soil were less than RFCA Tier II ALs and only slightly greater than background plus two standard deviations.
- Radionuclide activities in surface soil were less than Tier II ALs and only slightly greater than background plus two standard deviations.
- Action was not indicated by the Subsurface Soil Risk Screen.

44

Table 9
Residual Contamination at IHSS Group 600-1

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
600-1	PAC 600-1001 – Temporary Waste Storage - Building 663	CB37-002	Benzo(a)anthracene	0.0	0.5	83	41	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	110	99	NA	61,400.00	614.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	99	98	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	110	56	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	220	89	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	75	51	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	200	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-003	Acenapthene	0.0	0.5	110	49	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	130	83	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	380	42	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	410	100	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	350	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	390	99	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	430	57	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	1100	90	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	240	51	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	810	43	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-005	Benzo(a)anthracene	0.0	0.5	66	40	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	100	96	NA	61,400.00	614.00	ug/kg
			Chrysene	0.0	0.5	85	54	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	140	86	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	74	49	NA	614,000.00	6,140.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Pyrene	0.0	0.5	140	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-006	Acenapthene	0.0	0.5	54	47	NA	115,000,000.00	115,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	230	40	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	250	96	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	210	100	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	220	95	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	250	55	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	70	48	NA	61,400.00	614.00	ug/kg
			Fluoranthene	0.0	0.5	630	86	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	150	49	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	500	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-006	Benzene	0.5	2.5	230		NA	1,410.00	14.10	ug/kg
			Benzo(a)anthracene	0.5	2.5	49	46	NA	160,000.00	1,600.00	ug/kg
			Fluoranthene	0.5	2.5	120	98	NA	537,000,000.00	5,370,000.00	ug/kg
			Pyrene	0.5	2.5	94	47	NA	397,000,000.00	3,970,000.00	ug/kg
		CB37-009	Acenapthene	0.0	0.5	100	48	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	170	82	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	400	41	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	400	99	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	330	100	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	350	98	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	430	56	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	92	49	NA	61,400.00	614.00	ug/kg
			Fluoranthene	0.0	0.5	1200	88	NA	76,800,000.00	76,800,000.00	ug/kg
			Fluorene	0.0	0.5	81	80	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	250	50	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	920	42	NA	57,600,000.00	57,600,000.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
		CB37-010	Benzo(a)anthracene	0.0	0.5	55	39	NA	614,000.00	6,140.00	ug/kg
			Chrysene	0.0	0.5	70	54	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	110	85	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	100	40	NA	57,600,000.00	57,600,000.00	ug/kg
		CB37-011	Benzo(a)anthracene	0.0	0.5	44	41	NA	614,000.00	6,140.00	ug/kg
			Fluoranthene	0.0	0.5	93	89	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	81	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-013	Benzo(a)anthracene	0.5	2.5	64	45	NA	160,000.00	1,600.00	ug/kg
			Bis(2-ethylhexyl)phthalate	0.5	2.5	300	80	NA	311,000,000.00	3,110,000.00	ug/kg
			Chrysene	0.5	2.5	81	62	NA	16,000,000.00	160,000.00	ug/kg
			Fluoranthene	0.5	2.5	160	97	NA	537,000,000.00	5,370,000.00	ug/kg
			Pyrene	0.5	2.5	140	46	NA	397,000,000.00	3,970,000.00	ug/kg
		CB37-019	Acenapthene	0.0	0.5	150	51	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	150	87	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	330	43	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	360	100	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	270	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	310	100	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	390	59	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	120	52	NA	61,400.00	614.00	ug/kg
			Fluoranthene	0.0	0.5	920	94	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	270	53	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	790	45	NA	57,600,000.00	57,600,000.00	ug/kg
		CB38-001	Benzo(a)anthracene	0.0	0.5	100	40	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	120	96	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	110	100	NA	614,000.00	6,140.00	ug/kg
			Chrysene	0.0	0.5	120	54	NA	61,400,000.00	614,000.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Fluoranthene	0.0	0.5	230	86	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	92	49	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	210	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CB38-002	2-Methylnaphthalene	0.0	0.5	19000	310	NA	76,800,000.00	76,800,000.00	ug/kg
			Anthracene	0.0	0.5	4800	410	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	5400	210	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	4500	500	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	2000	530	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	1200	490	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	9100	280	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	1800	250	NA	61,400.00	614.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	1500	250	NA	614,000.00	6,140.00	ug/kg
			Naphthalene	0.0	0.5	8900	370	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	12000	210	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-001	Bis(2-ethylhexyl)phthalate	0.0	0.5	250	73	NA	32,000,000.00	320,000.00	ug/kg
		CC37-003	Acenapthene	0.0	0.5	75	49	NA	115,000,000.00	115,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	190	42	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	200	100	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	150	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	180	99	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	220	57	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	520	89	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	130	51	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	460	43	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-004	Benzoic acid	0	0.5	1100	370	NA	1,000,000,000.00	1,000,000,000.00	ug/kg
			Anthracene	0.5	2.5	220	70	NA	1,000,000,000.00	11,200.00	ug/kg
			Fluoranthene	0.5	2.5	230	42	NA	537,000,000.00	5,370,000.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Pyrene	0.5	2.5	220	61	NA	397,000,000.00	3,970,000.00	ug/kg
		CC37-006	Acenapthene	0.0	0.5	320	50	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	480	84	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	860	42	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	740	100	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	590	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	710	100	NA	6,140,000.00	61,400.00	ug/kg
			Bis(2-ethylhexyl)phthalate	0.0	0.5	150	74	NA	32,000,000.00	320,000.00	ug/kg
			Chrysene	0.0	0.5	920	57	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	2600	90	NA	76,800,000.00	76,800,000.00	ug/kg
			Fluorene	0.0	0.5	270	82	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	450	52	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	2100	43	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-008	Benzo(a)anthracene	0.0	0.5	150	40	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	180	97	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	130	100	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	160	96	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	180	55	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	390	86	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	120	49	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	360	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-009	Pyrene	0.0	0.5	77	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-012	Benzo(a)anthracene	0.0	0.5	130	47	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	150	61	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	130	76	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	130	82	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	150	41	NA	61,400,000.00	614,000.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Fluoranthene	0.0	0.5	370	47	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	94	53	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	340	67	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-014	Bis(2-ethylhexyl)phthalate	0.0	0.5	140	82	NA	32,000,000.00	320,000.00	ug/kg
			Butyl benzylphthalate	0.0	0.5	310	75	NA	384,000,000.00	384,000,000.00	ug/kg
			Chrysene	0.0	0.5	41	40	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	72	46	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	73	65	NA	57,600,000.00	57,600,000.00	ug/kg
			Methylene chloride	0.5	2.5	1.9	0.92	NA	578.00	5.78	ug/kg
		CC37-016	2-Methylnaphthalene	0.0	0.5	130	41	NA	76,800,000.00	76,800,000.00	ug/kg
			Acenapthene	0.0	0.5	590	52	NA	115,000,000.00	115,000,000.00	ug/kg
			Anthracene	0.0	0.5	630	75	NA	576,000,000.00	576,000,000.00	ug/kg
			Benzo(a)anthracene	0.0	0.5	1100	45	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	1200	59	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	950	73	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	1100	79	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	1200	39	NA	61,400,000.00	614,000.00	ug/kg
			Dibenz(a,h)anthracene	0.0	0.5	340	72	NA	61,400.00	614.00	ug/kg
			Dibenzofuran	0.0	0.5	220	58	NA	7,680,000.00	7,680,000.00	ug/kg
			Fluoranthene	0.0	0.5	3000	45	NA	76,800,000.00	76,800,000.00	ug/kg
			Fluorene	0.0	0.5	430	63	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	780	51	NA	614,000.00	6,140.00	ug/kg
			Naphthalene	0.0	0.5	380	49	NA	76,800,000.00	76,800,000.00	ug/kg
			Pentachlorophenol	0.0	0.5	410	74	NA	14,900,000.00	37,400.00	ug/kg
			Pyrene	0.0	0.5	2600	65	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-018	Benzo(a)anthracene	0.0	0.5	58	41	NA	614,000.00	6,140.00	ug/kg
			Chrysene	0.0	0.5	65	56	NA	61,400,000.00	614,000.00	ug/kg

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Fluoranthene	0.0	0.5	150	88	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	100	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-020	Pyrene	0.0	0.5	100	41	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-021	Pyrene	0.5	1	44	44	NA	397,000,000.00	3,970,000.00	ug/kg
			Benzo(a)anthracene	1	3	52	48	NA	160,000.00	1,600.00	ug/kg
			Chrysene	1	3	130	66	NA	16,000,000.00	160,000.00	ug/kg
			Pyrene	1	3	77	49	NA	397,000,000.00	3,970,000.00	ug/kg
		CC37-022	Chrysene	1	3	93	60	NA	16,000,000.00	160,000.00	ug/kg
		CC37-023	Methylene chloride	0.5	2.5	1.8	0.87	NA	578.00	5.78	ug/kg
		CC37-024	Butyl benzylphthalate	0.0	0.5	310	70	NA	384,000,000.00	384,000,000.00	ug/kg
			Methylene chloride	0.5	2.5	2.1	0.96	NA	578.00	5.78	ug/kg
		CC38-001	Benzo(a)anthracene	0.0	0.5	150	41	NA	614,000.00	6,140.00	ug/kg
			Benzo(a)pyrene	0.0	0.5	170	99	NA	61,400.00	614.00	ug/kg
			Benzo(b)fluoranthene	0.0	0.5	140	110	NA	614,000.00	6,140.00	ug/kg
			Benzo(k)fluoranthene	0.0	0.5	150	98	NA	6,140,000.00	61,400.00	ug/kg
			Chrysene	0.0	0.5	190	56	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	370	89	NA	76,800,000.00	76,800,000.00	ug/kg
			Indeno(1,2,3-cd)pyrene	0.0	0.5	120	51	NA	614,000.00	6,140.00	ug/kg
			Pyrene	0.0	0.5	360	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC38-002	Benzo(a)anthracene	0.0	0.5	55	41	NA	614,000.00	6,140.00	ug/kg
			Chrysene	0.0	0.5	70	55	NA	61,400,000.00	614,000.00	ug/kg
			Fluoranthene	0.0	0.5	140	87	NA	76,800,000.00	76,800,000.00	ug/kg
			Pyrene	0.0	0.5	140	42	NA	57,600,000.00	57,600,000.00	ug/kg
		CC37-CC04	Americium-241	4.5	4.5	0.473	0.188	0.02	209.00	38.00	pCi/g
			Plutonium239/240	4.5	4.5	3.70	0.118	0.02	1,090.00	252.00	pCi/g
			Uranium-234	4.5	4.5	0.464	0.110	2.64	1,738.00	307.00	pCi/g
			Uranium-235	4.5	4.5	ND	0.125	0.12	113.00	24.00	pCi/g

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte	Begin Depth	End Depth	Result	RL	Background Mean Plus Two Standard Deviations	Tier I AL	Tier II AL	Units
			Uranium -238	4.5	4.5	0.625	0.110	1.49	506.00	103.00	pCi/g
		CC37-CC06	Americium-241	4.5	4.5	2.71	0.281	0.02	209.00	38.00	pCi/g
			Plutonium239/240	4.5	4.5	17.1	0.0814	0.02	1,090.00	252.00	pCi/g
			Uranium-234	4.5	4.5	0.267	0.125	2.64	1,738.00	307.00	pCi/g
			Uranium-235	4.5	4.5	ND	0.158	0.12	113.00	24.00	pCi/g
			Uranium -238	4.5	4.5	0.525	0.169	1.49	506.00	103.00	pCi/g

4.0 STEWARDSHIP EVALUATION

The IHSS Group 600-1 stewardship evaluation was conducted through ongoing consultation with the regulatory agencies. The regulatory agencies were informed through frequent project updates, e-mail, telephone contact, and personal contact throughout the project duration. Copies of these documents are in Appendix C.

4.1.1 Current Site Conditions

As discussed in Section 2.0, the accelerated action at IHSS Group 600-1 consisted of removal of slabs, footers, utilities less than 3 feet below grade, and soil with americium and plutonium activities greater than Tier I ALs. Section 3.0 presents residual contamination information

The following conditions currently exist at IHSS Group 600-1:

- The potential source of contamination that had existed at IHSS Group 600-1 (i.e., the hot spot in the southeastern portion of Building 663) was removed;
- Surface soil contaminant concentrations greater than background means plus two standard deviations or MDLs includes SVOCs in the eastern portion of the IHSS Group, around former Building 663, and in the western portion of the IHSS Group.
- Subsurface soil contaminant concentrations greater than background means plus two standard deviations or MDLs includes radionuclides in the southeastern portion of former Building 663 at 4.5 feet depth.

4.1.2 Near Term Management Recommendations

The accelerated action for IHSS Group 600-1 met the accelerated action objectives. Contaminant concentrations in soil remaining at IHSS Group 600-1 do not trigger any further accelerated action. Potential contaminant sources and pathways have been removed, mitigated, or found not to have existed. Excavation at the site will continue to be controlled through the Site soil disturbance permit process. Fencing and signs restricting access will be posted to minimize disturbance to newly revegetated areas. Site access and security controls and the soil disturbance permit process will remain in place pending the implementation of long-term controls. No other near-term management techniques are required because of environmental conditions.

4.1.3 Long Term Stewardship Recommendations

SVOC contamination in surface soil and radionuclide contamination in the subsurface soil will be analyzed in the Sitewide CRA, which is part of the RCRA Facility Investigation/Remedial Investigation and Corrective Measures Study/Feasibility Study (RFI/RI and CMS/FS) that will be conducted for the Site. The need for and extent of any, more general, long term stewardship activities will also be analyzed in the RFI/RI and CMS/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 Corrective Action Decision/Record of

Decision (CAD/RODs), in any post-closure Colorado Hazardous Waste Act permit that may be required, and in any post-RFCA agreement.

No specific long term stewardship activities are recommended for IHSS Group 600-1 beyond the generally applicable Site requirements that may imposed on this area in the future, which are dependent upon the final remedy selected. 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, or prohibitions on groundwater pumping in the area of IHSS Group 600-1.

No specific engineered controls are anticipated as a result of the conditions remaining in IHSS Group 600-1.

No specific environmental monitoring is anticipated as a result of the conditions remaining in IHSS Group 600-1.

This closeout report and associated documentation will be retained as part of the Rocky Flats administrative record file. These specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long Term Stewardship Strategy.

4.1.4 Accelerated Action Stewardship

Stewardship actions that were implemented during the accelerated action included posting signs and barriers, including yellow chain and jersey barriers.

55

5.0 DATA QUALITY ASSESSMENT

The Data Quality Objectives (DQOs) for this project are described in the IASAP (DOE 2002). All DQOs for this project were achieved based on the following:

- Regulatory agency approved sampling program design (IASAP Addendum 02-01 [DOE 2001a);
- Collection of samples in accordance with the sampling design;
- Results of the Data Quality Assessment as described in the following sections.

5.1 Data Quality Assessment 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:

- EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process;
- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis; and
- DOE Order 414.1A, 1999, Quality Assurance.

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 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review;
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review; and
- Kaiser-Hill Company, L.L.C.(K-H) V&V Guidelines:
- General Guidelines for Data Verification and Validation, DA-GR01-v1, 1997a.
- V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, 1998.
- V&V Guidelines for Volatile Organics, DA-SS01-v1, 1997b.
- V&V Guidelines for Semivolatile Organics, DA-SS02-v1, 1997c.

56

- V&V Guidelines for Metals, DA-SS05-v1, 1997d.
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

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

5.2 Verification and Validation 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/MSD);
- Laboratory control samples (LCS);
- 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 (i.e., 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 hardcopy data (e.g., individual analytical data packages) are currently filed by RIN and are maintained by Kaiser-Hill Analytical Services Division; older hardcopies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS Soil and Water Database.

57

Both real and QC data, as of June 9, 2003 are included on the enclosed CDs.

5.2.1 Accuracy

The following measures of accuracy were evaluated:

- Laboratory Control Sample Evaluation;
- Surrogate Evaluation;
- Field Blanks; and
- Sample Matrix Spike Evaluation.

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

Laboratory Control Sample Evaluation

The frequency of Laboratory Control Sample (LCS) measurements, relative to each laboratory batch, is given in Table 10. LCS frequency was adequate based on at least one LCS per batch. The minimum and maximum LCS results are also tabulated, by chemical, for the entire project. While not all LCS results are within tolerances, project decisions based on AL exceedances were not affected. Any qualifications of results due to LCS performance exceeding upper or lower tolerance limits are captured in the V&V flags, described in the Completeness Section.

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. Any qualifications of results due to surrogate results are captured in the V&V flags, described in the Completeness Section.

Field Blank Evaluation

Results of the field blank analyses are given 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 non-laboratory contaminants, the real result is eliminated. None of the chemicals detected in blanks were detected at concentrations greater than ALs, therefore no significant blank contamination is indicated. Soil removal decisions were based on plutonium soil activity

Table 10
Laboratory Control Sample Evaluation

CAS No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
71-55-6	1,1,1-TRICHLOROETHANE	LC	85.11	98.85	8	8	%REC	SW-846 8260
79-34-5	1,1,2,2-TETRACHLOROETHANE	LC	83.75	106.2	8	8	%REC	SW-846 8260
79-00-5	1,1,2-TRICHLOROETHANE	LC	80.32	99.17	8	8	%REC	SW-846 8260
75-34-3	1,1-DICHLOROETHANE	LC	88.87	113.6	8	8	%REC	SW-846 8260
75-35-4	1,1-DICHLOROETHENE	LC	84	112.1	10	10	%REC	SW-846 8260
120-82-1	1,2,4-TRICHLOROBENZENE	LC	85.37	112.8	8	8	%REC	SW-846 8260
120-82-1	1,2,4-TRICHLOROBENZENE	LC	53	78	16	16	%REC	SW-846 8270B
107-06-2	1,2-DICHLOROETHANE	LC	86.96	103.5	8	8	%REC	SW-846 8260
78-87-5	1,2-DICHLOROPROPANE	LC	89.83	111.1	8	8	%REC	SW-846 8260
121-14-2	2,4-DINITROTOLUENE	LC	54	82	16	16	%REC	SW-846 8270B
78-93-3	2-BUTANONE	LC	88.54	114.6	8	8	%REC	SW-846 8260
95-57-8	2-CHLOROPHENOL	LC	57	76	16	16	%REC	SW-846 8270B
108-10-1	4-METHYL-2-PENTANONE	LC	67.89	98.85	8	8	%REC	SW-846 8260
83-32-9	ACENAPHTHENE	LC	55	76	16	16	%REC	SW-846 8270B
67-64-1	ACETONE	LC	98.15	194.7	8	8	%REC	SW-846 8260
7429-90-5	ALUMINUM	LC	95	98	2	2	%REC	SW-846 6010/6010B
14596-10-2	AM241	LC	95	95	1	1	%REC	ALPHA SPEC
74[illegible]-0	ANTIMONY	LC	93	95	2	2	%REC	SW-846 6010/6010B
7440-38-2	ARSENIC	LC	92	96	2	2	%REC	SW-846 6010/6010B
7440-39-3	BARIUM	LC	97	104	2	2	%REC	SW-846 6010/6010B
71-43-2	BENZENE	LC	87.43	110	10	10	%REC	SW-846 8260
7440-41-7	BERYLLIUM	LC	91	93	2	2	%REC	SW-846 6010/6010B
75-27-4	BROMODICHLOROMETHANE	LC	85.16	96.86	8	8	%REC	SW-846 8260
75-25-2	BROMOFORM	LC	84.62	106.4	8	8	%REC	SW-846 8260
74-83-9	BROMOMETHANE	LC	75.62	107.7	8	8	%REC	SW-846 8260
7440-43-9	CADMIUM	LC	94	98	2	2	%REC	SW-846 6010/6010B
75-15-0	CARBON DISULFIDE	LC	95.66	120.3	8	8	%REC	SW-846 8260
56-23-5	CARBON TETRACHLORIDE	LC	85.95	103.3	8	8	%REC	SW-846 8260
108-90-7	CHLOROBENZENE	LC	89.09	116.9	10	10	%REC	SW-846 8260
75-00-3	CHLOROETHANE	LC	87.2	116.9	8	8	%REC	SW-846 8260
67-66-3	CHLOROFORM	LC	86.6	97.41	8	8	%REC	SW-846 8260
74-87-3	CHLOROMETHANE	LC	73.67	127.6	8	8	%REC	SW-846 8260
10061-01-5	CIS-1,3-DICHLOROPROPENE	LC	88.61	103.6	8	8	%REC	SW-846 8260
7440-48-4	COBALT	LC	92	95	2	2	%REC	SW-846 6010/6010B
7440-50-8	COPPER	LC	96	100	2	2	%REC	SW-846 6010/6010B
124-48-1	DIBROMOCHLOROMETHANE	LC	81.78	99.07	8	8	%REC	SW-846 8260
100-41-4	ETHYLBENZENE	LC	87.8	110.4	8	8	%REC	SW-846 8260
87-68-3	HEXACHLOROBUTADIENE	LC	86.25	111.7	8	8	%REC	SW-846 8260
7439-89-6	IRON	LC	94	98	2	2	%REC	SW-846 6010/6010B
7439-92-1	LEAD	LC	95	99	2	2	%REC	SW-846 6010/6010B
74[illegible]3-2	LITHIUM	LC	97	100	2	2	%REC	SW-846 6010/6010B
7[illegible]-5	MANGANESE	LC	95	97	2	2	%REC	SW-846 6010/6010B
7439-97-6	MERCURY	LC	104	104	1	1	%REC	SW-846 6010/6010B

C[illegible] No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
75-09-2	METHYLENE CHLORIDE	LC	85.51	102	8	8	%REC	SW-846 8260
7439-98-7	MOLYBDENUM	LC	92	94	2	2	%REC	SW-846 6010/6010B
91-20-3	NAPHTHALENE	LC	81.46	106.4	8	8	%REC	SW-846 8260
7440-02-0	NICKEL	LC	96	100	2	2	%REC	SW-846 6010/6010B
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	LC	58	77	16	16	%REC	SW-846 8270B
95-50-1	O-DICHLOROBENZENE	LC	86.12	101.5	8	8	%REC	SW-846 8260
106-46-7	P-DICHLOROBENZENE	LC	88.64	105.6	8	8	%REC	SW-846 8260
106-46-7	P-DICHLOROBENZENE	LC	54	71	16	16	%REC	SW-846 8270B
87-86-5	PENTACHLOROPHENOL	LC	56	87	16	16	%REC	SW-846 8270B
108-95-2	PHENOL	LC	55	76	16	16	%REC	SW-846 8270B
100-02-7	P-NITROPHENOL	LC	44	89	16	16	%REC	SW-846 8270B
10-12-8	PU239240	LC	99	99	1	1	%REC	ALPHA SPEC
129-00-0	PYRENE	LC	53	77	16	16	%REC	SW-846 8270B
7782-49-2	SELENIUM	LC	90	98	2	2	%REC	SW-846 6010/6010B
7440-22-4	SILVER	LC	98	100	2	2	%REC	SW-846 6010/6010B
7440-24-6	STRONTIUM	LC	98	103	2	2	%REC	SW-846 6010/6010B
100-42-5	STYRENE	LC	90.55	121.7	8	8	%REC	SW-846 8260
127-18-4	TETRACHLOROETHENE	LC	83.95	95.4	8	8	%REC	SW-846 8260
7440-31-5	TIN	LC	91	94	2	2	%REC	SW-846 6010/6010B
108-88-3	TOLUENE	LC	88.51	102	10	10	%REC	SW-846 8260
10[illegible]2-6	TRANS-1,3-DICHLOROPROPENE	LC	85.85	101.3	8	8	%REC	SW-846 8260
79-01-6	TRICHLOROETHENE	LC	87.06	101	10	10	%REC	SW-846 8260
11-08-5	U233234	LC	94	94	1	1	%REC	ALPHA SPEC
15117-96-1	U235	LC	103	103	1	1	%REC	ALPHA SPEC
7440-61-1	U238	LC	92	92	1	1	%REC	ALPHA SPEC
7440-62-2	VANADIUM	LC	94	94	2	2	%REC	SW-846 6010/6010B
75-01-4	VINYL CHLORIDE	LC	82.25	121.9	8	8	%REC	SW-846 8260
1330-20-7	XYLENES (TOTAL)	LC	82.53	102.5	8	8	%REC	SW-846 8260
7440-66-6	ZINC	LC	91	96	2	2	%REC	SW-846 6010/6010B

Table 11
Surrogate Recovery Summary

VOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum	Maximum	Unit Code
121	1,2-DICHLOROETHANE-D4	80.23	122.2	%REC
121	4-BROMOFLUOROBENZENE	67.18	110	%REC
121	TOLUENE-D8	76.43	111.1	%REC
SVOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum	Maximum	Unit Code
90	2-FLUOROBIPHENYL	44	89	%REC
90	2-FLUOROPHENOL	0	80	%REC
90	NITROBENZENE-D5	48	104	%REC
90	TERPHENYL-D14	37	90	%REC

Table 12
Field Blank Summary

Sample QC Code	Test Method Name	Analyte	Maximum Detected Value	Unit
RB	GAMMA	Uranium-235	0.2	pCi/g
RB	GAMMA	Uranium-238	4	pCi/g
Field Blanks (Trip, Rinse, Field) results greater than detection limits (not *U* Qualified)				

Sample Matrix Spike Evaluation

The frequency of MS measurements, relative to each laboratory batch, was adequate based on at least one MS per batch. The minimum and maximum of MS results are summarized by chemical, for the entire project in Table 13. While some of the recoveries appear to be low, they would not result in rejection of data that affects the project decision. Soil removal decisions were based on plutonium soil activity.

Table 13
Sample Matrix Spike Evaluation

CAS No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
71-55-6	1,1,1-TRICHLOROETHANE	MS	63.79	99.38	5	5	%REC	SW-846 8260
79-34-5	1,1,2,2-TETRACHLOROETHANE	MS	58	93.8	5	5	%REC	SW-846 8260
79-00-5	1,1,2-TRICHLOROETHANE	MS	64.61	90.45	5	5	%REC	SW-846 8260
75-34-3	1,1-DICHLOROETHANE	MS	50	97.4	5	5	%REC	SW-846 8260
75-35-4	1,1-DICHLOROETHENE	MS	58.02	94	6	6	%REC	SW-846 8260
120-82-1	1,2,4-TRICHLOROBENZENE	MS	31.33	68.42	5	5	%REC	SW-846 8260
120-82-1	1,2,4-TRICHLOROBENZENE	MS	46	69	10	10	%REC	SW-846 8270B
107-06-2	1,2-DICHLOROETHANE	MS	57.95	101.8	5	5	%REC	SW-846 8260
78-87-5	1,2-DICHLOROPROPANE	MS	50.69	87.58	5	5	%REC	SW-846 8260
121-14-2	2,4-DINITROTOLUENE	MS	48	84	10	10	%REC	SW-846 8270B
78-93-3	2-BUTANONE	MS	57.85	97.55	5	5	%REC	SW-846 8260
95-57-8	2-CHLOROPHENOL	MS	47	72	10	10	%REC	SW-846 8270B
108-10-1	4-METHYL-2-PENTANONE	MS	78.59	118.4	5	5	%REC	SW-846 8260
83-32-9	ACENAPHTHENE	MS	53	74	10	10	%REC	SW-846 8270B
67-64-1	ACETONE	MS	40.46	99.77	5	5	%REC	SW-846 8260
7429-90-5	ALUMINUM	MS	1350	1590	2	2	%REC	SW-846 6010/6010B
7440-36-0	ANTIMONY	MS	57	60	2	2	%REC	SW-846 6010/6010B
7440-38-2	ARSENIC	MS	94	98	2	2	%REC	SW-846 6010/6010B
7440-39-3	BARIUM	MS	109	110	2	2	%REC	SW-846 6010/6010B
71-43-2	BENZENE	MS	55.57	107	6	6	%REC	SW-846 8260
7440-41-7	BERYLLIUM	MS	91	92	2	2	%REC	SW-846 6010/6010B
75-27-4	BROMODICHLOROMETHANE	MS	61.62	89.15	5	5	%REC	SW-846 8260
75-25-2	BROMOFORM	MS	59.44	91.17	5	5	%REC	SW-846 8260

AS No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
74-83-9	BROMOMETHANE	MS	43.87	108.8	5	5	%REC	SW-846 8260
7440-43-9	CADMIUM	MS	90	95	2	2	%REC	SW-846 6010/6010B
75-15-0	CARBON DISULFIDE	MS	45.77	84.67	5	5	%REC	SW-846 8260
56-23-5	CARBON TETRACHLORIDE	MS	62.7	98.3	5	5	%REC	SW-846 8260
108-90-7	CHLOROBENZENE	MS	44.67	106	6	6	%REC	SW-846 8260
75-00-3	CHLOROETHANE	MS	46.97	89	5	5	%REC	SW-846 8260
67-66-3	CHLOROFORM	MS	61.02	99.08	5	5	%REC	SW-846 8260
74-87-3	CHLOROMETHANE	MS	31.66	82.17	5	5	%REC	SW-846 8260
10061-01-5	CIS-1,3-DICHLOROPROPENE	MS	51.25	88.17	5	5	%REC	SW-846 8260
7440-48-4	COBALT	MS	88	91	2	2	%REC	SW-846 6010/6010B
7440-50-8	COPPER	MS	98	133	2	2	%REC	SW-846 6010/6010B
124-48-1	DIBROMOCHLOROMETHANE	MS	64.85	88.5	5	5	%REC	SW-846 8260
100-41-4	ETHYLBENZENE	MS	49.28	89.9	5	5	%REC	SW-846 8260
87-68-3	HEXACHLOROBUTADIENE	MS	35.34	60.35	5	5	%REC	SW-846 8260
7439-89-6	IRON	MS	374	1140	2	2	%REC	SW-846 6010/6010B
7439-92-1	LEAD	MS	24	113	2	2	%REC	SW-846 6010/6010B
7439-93-2	LITHIUM	MS	100	102	2	2	%REC	SW-846 6010/6010B
7439-96-5	MANGANESE	MS	0	210	2	2	%REC	SW-846 6010/6010B
39-97-6	MERCURY	MS	87	87	1	1	%REC	SW-846 6010/6010B
75-09-2	METHYLENE CHLORIDE	MS	57.84	98.1	5	5	%REC	SW-846 8260
7439-98-7	MOLYBDENUM	MS	89	94	2	2	%REC	SW-846 6010/6010B
91-20-3	NAPHTHALENE	MS	41.49	71.74	5	5	%REC	SW-846 8260
7440-02-0	NICKEL	MS	93	101	2	2	%REC	SW-846 6010/6010B
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	MS	48	71	10	10	%REC	SW-846 8270B
95-50-1	O-DICHLOROBENZENE	MS	46.3	84.55	5	5	%REC	SW-846 8260
106-46-7	P-DICHLOROBENZENE	MS	41.89	83.1	5	5	%REC	SW-846 8260
106-46-7	P-DICHLOROBENZENE	MS	43	67	10	10	%REC	SW-846 8270B
87-86-5	PENTACHLOROPHENOL	MS	30	74	10	10	%REC	SW-846 8270B
108-95-2	PHENOL	MS	47	73	10	10	%REC	SW-846 8270B
100-02-7	P-NITROPHENOL	MS	36	81	10	10	%REC	SW-846 8270B
129-00-0	PYRENE	MS	43	73	10	10	%REC	SW-846 8270B
7782-49-2	SELENIUM	MS	93	100	2	2	%REC	SW-846 6010/6010B
7440-22-4	SILVER	MS	96	99	2	2	%REC	SW-846 6010/6010B
7440-24-6	STRONTIUM	MS	115	147	2	2	%REC	SW-846 6010/6010B
100-42-5	STYRENE	MS	38.05	85.63	5	5	%REC	SW-846 8260
127-18-4	TETRACHLOROETHENE	MS	61.54	85.87	5	5	%REC	SW-846 8260
7440-31-5	TIN	MS	88	94	2	2	%REC	SW-846 6010/6010B
8-88-3	TOLUENE	MS	56.31	107	6	6	%REC	SW-846 8260
10061-02-6	TRANS-1,3-DICHLOROPROPENE	MS	54.18	89.25	5	5	%REC	SW-846 8260

62

CAS No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
79-01-6	TRICHLOROETHENE	MS	59.67	104	6	6	%REC	SW-846 8260
7440-62-2	VANADIUM	MS	109	129	2	2	%REC	SW-846 6010/6010B
75-01-4	VINYL CHLORIDE	MS	42.31	81.35	5	5	%REC	SW-846 8260
1330-20-7	XYLENES (TOTAL)	MS	53.14	96.46	5	5	%REC	SW-846 8260
7440-66-6	ZINC	MS	85	121	2	2	%REC	SW-846 6010/6010B

5.2.2 Precision

Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSD. Adequate frequency of MSD measurements is indicated by at least one MSD in each laboratory batch. Table 14 indicates that MSD frequencies were adequate. Relative percent differences (RPDs) exceeding 35 percent do not affect project decisions because all real sample results were repeatable below ALs.

Table 14
Sample Matrix Spike Duplicate Evaluation

Analyte Name	Number of Sample Pairs	Number of Laboratory Batches	Max RPD (%)
1,1,1-TRICHLOROETHANE	5	5	37.98
1,1,2,2-TETRACHLOROETHANE	5	5	39.32
1,1,2-TRICHLOROETHANE	5	5	42.33
1,1-DICHLOROETHANE	5	5	38.01
1,1-DICHLOROETHENE	6	6	35.13
1,2,4-TRICHLOROBENZENE	5	5	48.24
1,2,4-TRICHLOROBENZENE	10	10	28.04
1,2-DICHLOROETHANE	5	5	39.22
1,2-DICHLOROPROPANE	5	5	43.06
2,4-DINITROTOLUENE	10	10	19.18
2-BUTANONE	5	5	38.13
2-CHLOROPHENOL	10	10	14.77
4-METHYL-2-PENTANONE	5	5	40.77
ACENAPHTHENE	10	10	17.60
ACETONE	5	5	28.85
ALUMINUM	2	2	9.58
ANTIMONY	2	2	3.39
ARSENIC	2	2	1.07
BARIUM	2	2	2.76
BENZENE	6	6	37.33
BERYLLIUM	2	2	1.10
BROMODICHLOROMETHANE	5	5	40.67
BROMOFORM	5	5	37.71

63

Analyte Name	Number of Sample Pairs	Number of Laboratory Batches	Max RPD (%)
BROMOMETHANE	5	5	49.14
CARBON DISULFIDE	5	5	37.62
CARBON TETRACHLORIDE	5	5	38.70
CHLOROBENZENE	6	6	37.23
CHLOROETHANE	5	5	48.36
CHLOROFORM	5	5	38.71
CHLOROMETHANE	5	5	40.69
CIS-1,3-DICHLOROPROPENE	5	5	41.83
COBALT	2	2	1.14
COPPER	2	2	21.00
DIBROMOCHLOROMETHANE	5	5	41.76
ETHYLBENZENE	5	5	36.50
HEXACHLOROBUTADIENE	5	5	40.59
IRON	2	2	121.43
LEAD	2	2	106.80
LITHIUM	2	2	1.98
MANGANESE	1	1	33.33
MERCURY	1	1	1.16
METHYLENE CHLORIDE	5	5	39.75
MOLYBDENUM	2	2	2.15
NAPHTHALENE	5	5	43.72
NICKEL	2	2	1.08
PENTACHLOROPHENOL	10	10	31.58
PHENOL	10	10	16.22
PYRENE	10	10	70.68
SELENIUM	2	2	1.08
SILVER	2	2	2.11
STRONTIUM	2	2	7.77
TETRACHLOROETHENE	5	5	38.83
TIN	2	2	2.30
TOLUENE	6	6	40.88
TRANS-1,3-DICHLOROPROPENE	5	5	41.85
TRICHLOROETHENE	6	6	40.58
VANADIUM	2	2	5.28
VINYL CHLORIDE	5	5	35.11
ZINC	2	2	14.21

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 adequate. A common metric for evaluating precision is the RPD value; RPD values are given in Table 16. Ideally, RPDs of less than 35 percent (in soil) indicate satisfactory precision. Values exceeding 35 percent only affect project decisions if the imprecision is great enough to cause contradictory decisions relative to the COC (i.e., one sample

indicates clean soil whereas the QC partner does not). As indicated by the data in Table 16, a number of analytes, generally VOCs and SVOCs, have RPDs greater than 35 percent, however, project decisions were based only on analytes that exceeded ALs, in this case, plutonium.

Table 15
Field Duplicate Sample Frequency

Test Method Name	Sample Code	Number of Samples	% Duplicate Samples
ALPHA SPEC	REAL	2	0
GAMMA SPECTROSCOPY	REAL	54	13
GAMMA SPECTROSCOPY	DUP	7	
SW-846 6010/6010B	REAL	2	0
SW-846 6200	REAL	4	0
SW-846 8260	REAL	43	16
SW-846 8260	DUP	7	
SW-846 8270B	REAL	43	16
SW-846 8270B	DUP	7	

Table 16
RPD Evaluation

Analyte	Max of RPD %
1,1,1-TRICHLOROETHANE	70.43
1,1,2,2-TETRACHLOROETHANE	65.15
1,1,2-TRICHLOROETHANE	54.82
1,1-DICHLOROETHANE	55.16
1,1-DICHLOROETHENE	6.75
1,2,4-TRICHLOROBENZENE	199.36
1,2-DICHLOROETHANE	40.59
1,2-DICHLOROPROPANE	118.68
2,4,5-TRICHLOROPHENOL	20.51
2,4,6-TRICHLOROPHENOL	20.51
2,4-DICHLOROPHENOL	20.51
2,4-DIMETHYLPHENOL	20.51
2,4-DINITROPHENOL	21.05
2,4-DINITROTOLUENE	20.51
2,6-DINITROTOLUENE	20.51
2-BUTANONE	45.71
2-CHLORONAPHTHALENE	20.51
2-CHLOROPHENOL	20.51
2-NITROANILINE	21.05
4-CHLOROANILINE	20.51
4-METHYL-2-PENTANONE	93.31
ACENAPHTHENE	114.89

65

ACETONE	118.84
ANTHRACENE	96.00
BENZENE	81.35
BENZO(A)ANTHRACENE	101.89
BENZO(A)PYRENE	90.91
BENZO(B)FLUORANTHENE	101.89
BENZO(K)FLUORANTHENE	101.89
BENZOIC ACID	21.05
BIS(2-ETHYLHEXYL)PHTHALATE	20.51
BROMODICHLOROMETHANE	100.48
BROMOFORM	17.33
BROMOMETHANE	66.94
BUTYLBENZYLPHTHALATE	20.51
CARBON DISULFIDE	73.97
CARBON TETRACHLORIDE	89.86
CHLOROBENZENE	91.51
CHLOROETHANE	12.09
CHLOROFORM	75.18
CHLOROMETHANE	6.45
CHRYSENE	90.91
CIS-1,3-DICHLOROPROPENE	93.28
DIBENZ(A,H)ANTHRACENE	120.35
DIBENZOFURAN	20.51
DIBROMOCHLOROMETHANE	65.37
ETHYLBENZENE	78.86
FLUORANTHENE	105.73
FLUORENE	128.16
HEXACHLOROBENZENE	20.51
HEXACHLOROBUTADIENE	199.48
HEXACHLOROCYCLOPENTADIENE	20.51
HEXACHLOROETHANE	20.51
INDENO(1,2,3-CD)PYRENE	123.89
ISOPHORONE	20.51
METHYLENE CHLORIDE	63.98
NAPHTHALENE	198.93
NITROBENZENE	20.51
N-NITROSODIPHENYLAMINE	20.51
PENTACHLOROPHENOL	21.05
PHENOL	20.51
PYRENE	85.27
TETRACHLOROETHENE	34.67
TOLUENE	100.60
TRANS-1,3-DICHLOROPROPENE	59.00
TRICHLOROETHENE	49.66
VINYL CHLORIDE	7.50

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. Because the frequency of validation is within program quality requirements of RFETS validation goal of 25 percent of all analytical records the results indicate that these data are adequate.

5.2.3 Sensitivity

Reporting limits, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides, were compared with proposed 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 less than an analyte's associated AL, typically less than one-half the AL.

5.3 Summary of Data Quality

The RPDs greater than 35 percent indicate that the sampling precision limits some analytes has been exceeded. However, the imprecision does not affect project decisions because the only AL exceedance was plutonium. Less than 1 percent of the records were rejected. Approximately 50 percent of the radionuclide data was validated. Compliance with the program quality requirements and the RFETS validation goal of 25 percent of all program analytical records indicates that the unvalidated data are adequate for project decisions. If additional V&V information is received, IHSS Group 600-1 records will be updated in the Soil Water Database. Data qualified as a result of additional data will be assessed as part of the Comprehensive Risk Assessment process. Data collected and used for IHSS Group 600-1 is adequate for decision-making.

67

Table 17
Validation and Verification Summary

Validation Code	Number of Records	Radionuclides	Metals	SVOCs	VOCs
No V&V	4080	1520	0		2560
1	5	0	0	5	
J1	43	0	31		12
R1	16	0	0	16	
V	1488	1488	0		
V1	4330	0	111	4031	188
JB1	3	0	0		3
UJ1	93	0	0	87	6
Total	10058	3008	142	4139	2769
Total Validated	1488	1488	0	0	0
% Validated	14.79%	49.47%	0.00%	0.00%	0.00%
Total Verified	5978	1488	142	4139	209
% Verified	59.44%	49.47%	100.00%	100.00%	7.55%
% Rejected	0.16%	0.00%	0.00%	0.39%	0.00%

KEY:
1, V1 - Verified
J, J1 - Estimated
UJ1 - Estimated detection limit
V - Validated

6.0 REFERENCES

CDPHE, 2002, Environmental Restoration RFCA Standard Operating Protocol FY02 Notification #02-04 Approval Letter, June 2002.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, CO.

DOE, 1999a, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, CO.

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

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

DOE 2001b, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November.

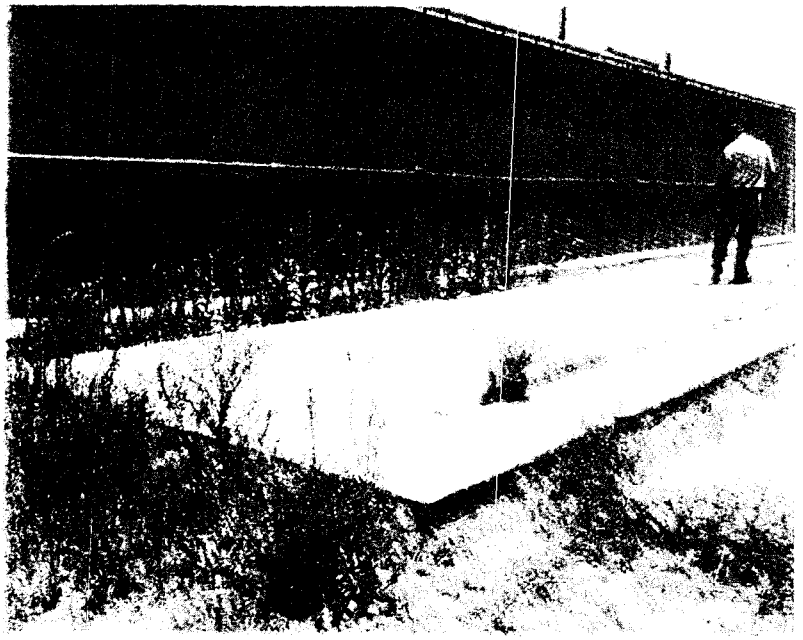
DOE, 2001c, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, CO, September.

DOE 2002a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, CO. January.

DOE 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification #02-04, Rocky Flats Environmental Technology Site, Golden, CO, June.

Appendix A – Project Photographs

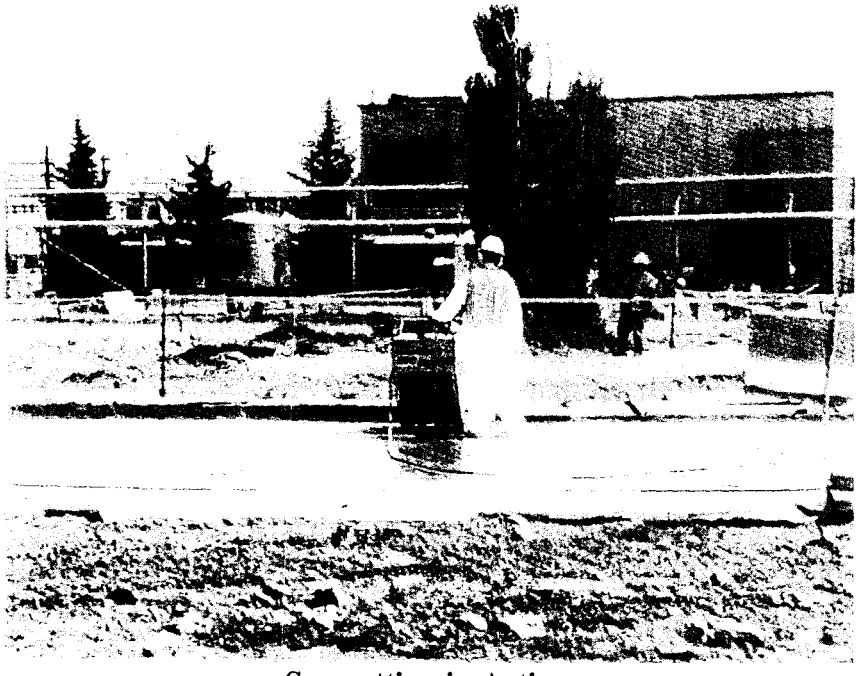
Best Available Copy



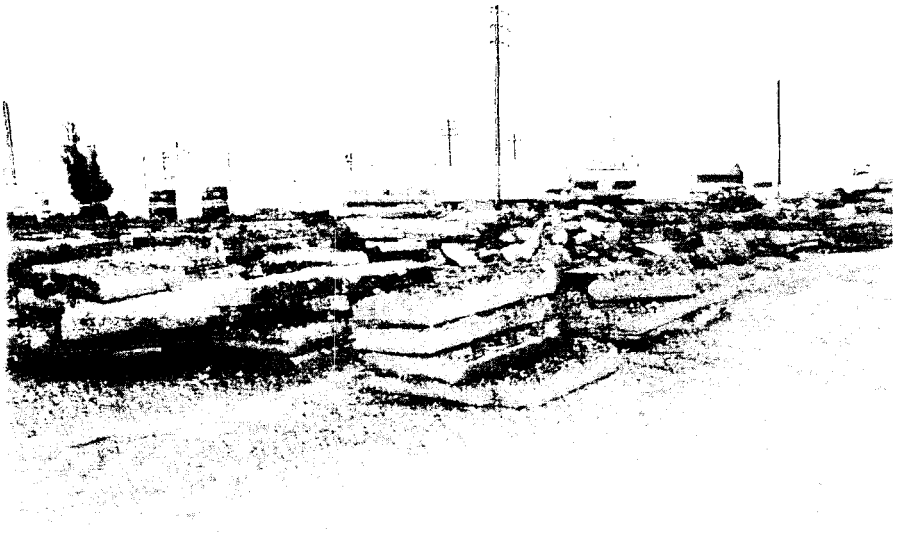
West Side of 663

662 Before East Slab Removal

663 Slab



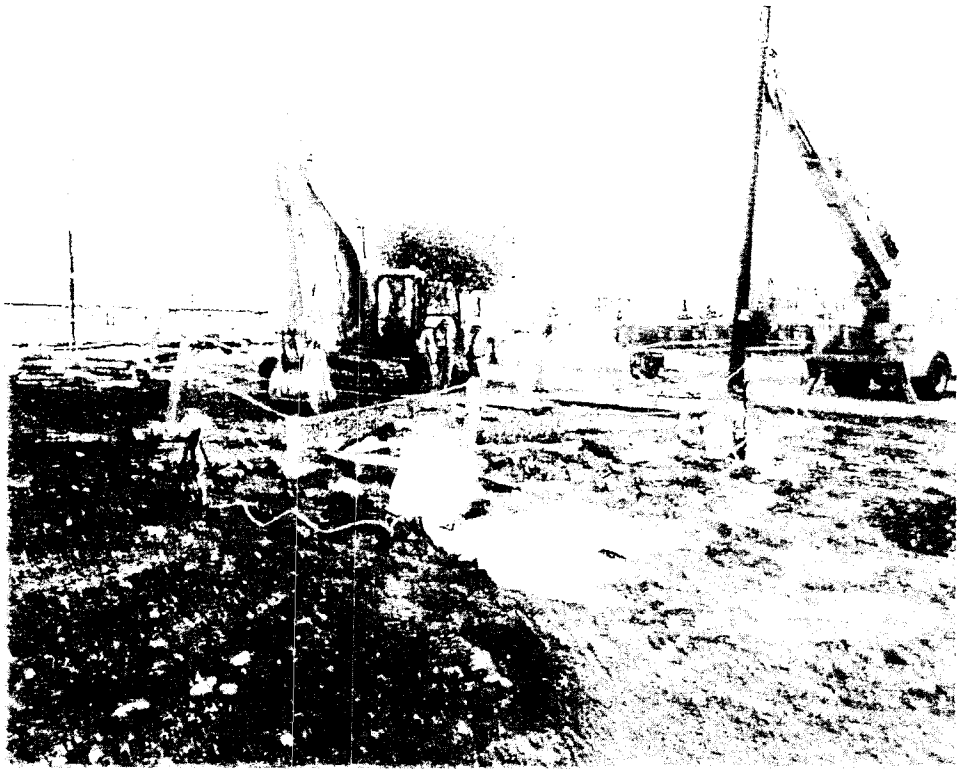
Sawcutting in Action



Results of 663 Sawcut

Results of Sawcut

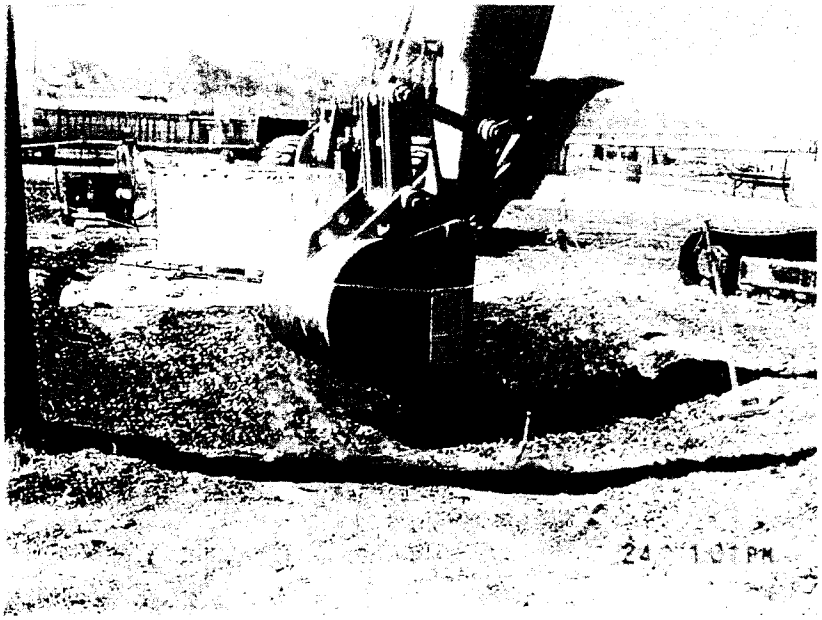
73



Hot Spot After Fixative is Applied

Fixative Application

Fixative Application

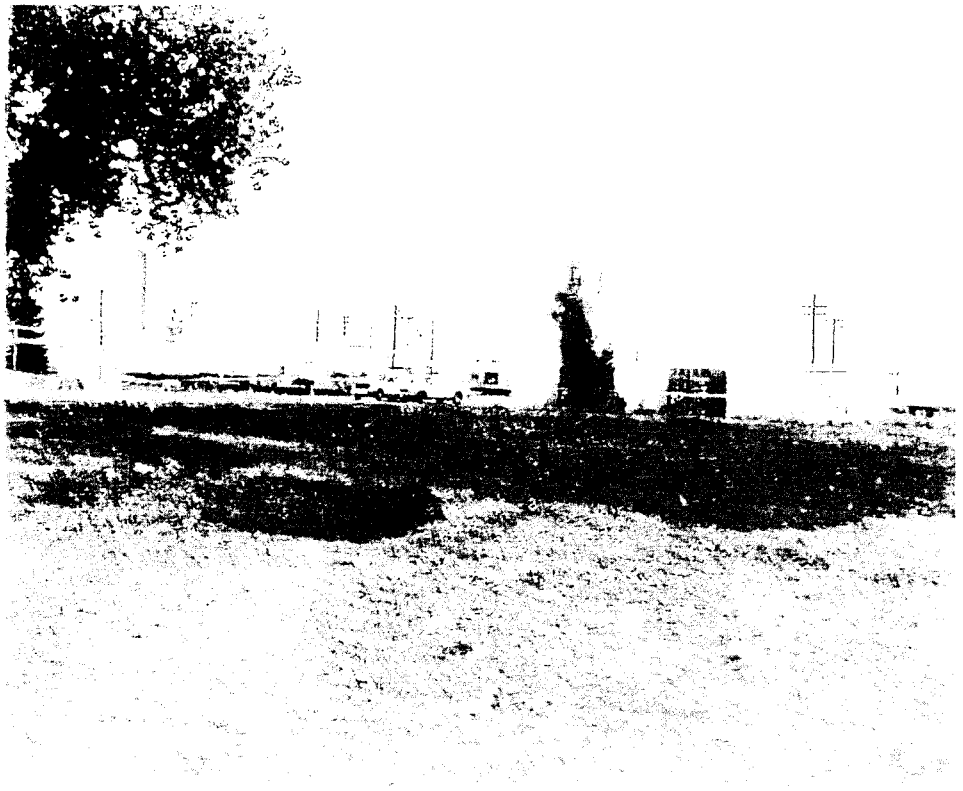


Initial Excavation

Final Excavation

Second Slab under 663

76



Cleaned East Slabs

77

Appendix B – Correspondence

78

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ENVIRONMENTAL RESTORATION
REGULATORY CONTACT RECORD

Date/Time: June 19, 2002

Site Contact(s): Susan Serreze
Phone: 303-966-2677

Regulatory Contact: Elizabeth Pottorff, CDPHE; David Kruchek, CDPHE; Gary Kleeman, EPA
Phone: 303-692-3429, 303-692-3328, 303-312-6246

Agency: CDPHE/EPA

Purpose of Contact: Notification to Remove Miscellaneous Slabs

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Discussion
As discussed at the May 30' 2002 meeting on ER RSOP Notification #02-04, this Regulatory Contact Record is the notification that miscellaneous slabs east of IHSS Group 600-1 will be removed at the same time as slabs covered under ER RSOP Notification #02-04.

Required Distribution:

C. Spreng, CDPHE
D. Kruchek, CDPHE
E. Pottorff, CDPHE
G. Kleeman, EPA
N. Castaneda, RFFO
R. DiSalvo, RFFO
S. Surovchek, RFFO
L. Brooks, K-H
M. Broussard, K-H
L. Butler, K-H
A. Primrose, K-H
S. Nesta, K-H
L. Norland, K-H
S. Serreze, Arcadia
C. Madore, RMC
M. Burmeister, RMC
C. Cowdery, Washington Group
S. Luker, RMC
ER Meeting Minutes Book
Administrative Record

79

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
REGULATORY CONTACT RECORD

Date/Time: August 7, 2002/ 1430

Site Contact(s): Steve Nesta and Steve Tower
Phone: 6386 and 2133

Regulatory Contact: Dave Kruchek
Phone: 6728

Agency: CDPHE

Purpose of Contact: Clarify requirements for ER/D&D Interface for B442/662/663

Discussion
A meeting was held with KH, DOE, and CDPHE to resolve the issue of proper notification for the B442, B662, and B663 slab and sewer pipe removals. It was agreed that it was not correct to split a single facility into two separate types (the uncontaminated building as Type 1, and the contaminated slab as Type 2). Instead, the proper path for future projects will be to submit a RSOP notification for a facility as a Type 2, identify the free releasable portions, and transfer the remaining portions such as contaminated slabs to ER, for remediation as debris for remediation under the ER RSOP.

For the work that has been done to date, it was further agreed with CDPHE that a new Facility Disposition RSOP notification letter will be submitted to identify work at B442, B662 and B663, that has been transitioned to the ER RSOP. At B442, the slab, and the sewer pipe was left in place after building demolition because of fixed contamination. ER has subsequently removed the B442 slab and removed the sewer pipe to greater than six feet below grade (ER Notice #02-06). Because the slabs at B662 and B663 are contaminated, they were left in place to be removed by ER under the ER RSOP (ER Notice # 02-07). The new RSOP notification letter will address these issues formally.

Contact Record Prepared By: Steve Nesta

Required Distribution:

P. Arnold, K-H 371
J. Berardini, K-H MS
K. Lavorato, K-H MS
J. Legare, DOE

Additional Distribution:

A. Primrose
D. Foss

C. Deck, K-H
R. DiSalvo
C. Gilbreath, K-H 771
S. Gunderson, CDPHE
T. Hopkins, K-H 776
L. Kilpatrick, RFFO

R. Leitner, K-H 371
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS
B. Prymak, DOE
T. Rehder, USEPA
D. Shelton, K-H

K. Kehler
S. Tower
F. Gerdeman
D. Kruchek
L. Butler_____
_____
_____

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time: September 11, 2002/ 1445

Site Contact(s): Mike Bemski
Phone: 303-966-4090

Regulatory Contact: David Kruchek
Phone: 303-628-3328

Agency: CDPHE

Purpose of Contact: Approval to backfill excavations associated with the former B-662 Slab

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Discussion

On Monday, September 9, Dave Kruchek and I discussed backfill of excavations associated with the former B-662 Slab. The first excavation was the product of the removal of the B-662 footer foundation at the north end of the former slab. Present within the footer were a series of pipes that had rusted into the soil. Dave approved the backfill, but requested a sample be collected in the vicinity of the where the pipes had been. The sample will be collected during Geoprobe characterization of the former slab area. The second excavation was in association with exploration for a documented second slab beneath the recently removed slab. No second slab was found. Dave approved the backfill of the second excavation, but requested that should any Geoprobe characterization locations fall near the former excavation, the location be offset away sufficiently to not be sampling soil that had possibly been de-volatilized from the excavation.

Contact Record Prepared By: Mike Bemski

Required Distribution:

S. Bell, RFFO
L. Brooks, K-H ESS
L. Butler, K-H RISS
C. Deck, K-H Legal
R. DiSalvo, RFFO
S. Gunderson, CDPHE
J. Legare, RFFO
D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS
T. Rehder, USEPA
D. Shelton, K-H
C. Spreng, CDPHE

Additional Distribution (choose names as applicable):

M. Broussard, K-H RISS
J. Hindman, CDPHE
G. Kleeman, USEPA
D. Kruchek, CDPHE
L. Norland, K-H RISS
A. Primrose, K-H RISS
E. Pottorff, CDPHE
S. Tower, DOE

Serreze, Susan

From: David Kruchek
Sent: Friday, November 15, 2002 7:27 AM
To: #ER Contact Records; Bemski, Mike; Serreze, Susan
Cc: Carl Spreng; Elizabeth Pottorff; Steve Tarlton
Subject: Re: 600-1 Notification of Completion Contact Record

Mike,

I don't know if you got the message I tried to leave on your cell phone, so I will re-state it here. Although we did review the raw data as presented in the meeting and did not identify any specific issues other than as addressed in your contact record, the SORs will still need to be developed. If any SORs are indicated to be excessively higher than the norm for this data set then additional soil remediation/removal may be warranted. So...when the SORs are calculated please let us know.

David

>>> "Bemski, Mike" <Mike.Bemski@rfets.gov> 11/14/02 04:59PM >>>
<<600-1 ER_Contact_record1 11-14-02.doc>>

Mike Bemski
Environmental Restoration
303-966-4090, FAX 966-4165
Cell Phone 303-994-2305
dp 303-212-6271, Bldg. T-124-A, Cube 38
Email mike.bemski@rfets.gov

83

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time: October 10, 2002/ 5:28PM

Site Contact(s): Michael Bemski
Phone: 303-966-4090

Regulatory Contact: David Kruchek
Phone: 303-692-3328

Agency: Colorado Department of Public Health and Environment

Purpose of Contact: Permission to backfill excavation of former hot spot at the southeast corner of the former Building 663 slab

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Discussion

This Contact Record is the follow-up to our telephone conversation of earlier today. After 3 attempts, sample results indicate all contamination associated with the former hot spot discovered under the southeast corner of the former Building 663 slab has been removed. Our discussion pondered why the contamination persisted from the slab to over 3 feet into the soil below and still had a sub-action level hit below 5 feet. Also unknown is why no lateral dispersion of the contamination had occurred. As the history of what happened to create the spill and how it was handled will remain unknown, the discussion served to raise the questions but there are no clear answers. The final sampling explored for contamination immediately under the former crack in the slab and the area adjacent. As no contamination was found to be at or above action levels of 50 pCi/g Pu, permission was given to backfill the excavation. The two samples with the highest results have been sent to an offsite lab for final confirmation alpha spectrometry. Should any significant deviation from the earlier results be noted, CDPHE will be contacted.

Contact Record Prepared By: Michael Bemski

Required Distribution:

S. Bell, RFFO
L. Brooks, K-H ESS
L. Butler, K-H RISS
C. Deck, K-H Legal
R. DiSalvo, RFFO
S. Gunderson, CDPHE
J. Legare, RFFO
D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS
T. Rehder, USEPA
D. Shelton, K-H
C. Spreng, CDPHE

Additional Distribution (choose names as applicable):

M. Broussard, K-H RISS
J. Hindman, CDPHE
G. Kleeman, USEPA
D. Kruchek, CDPHE
L. Norland, K-H RISS
A. Primrose, K-H RISS
E. Pottorff, CDPHE
S. Tower, DOE

84

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time: November 14, 2002 / 1430

Site Contact(s): Mike Bemski
Phone: 303-966-4090

Regulatory Contacts: Dave Kruchek / Elizabeth Pottorff
Phones: 303-692-3328 / 303-692-3429

Agency: Colorado Department of Public Health and Environment

Purpose of Contact: Notification of completion of the 600-1 Remediation Project

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Discussion

At the meeting held earlier today regarding the IHSS Group 600-1, we reviewed the final analytical data and agreed that the 600-1 Remediation Project is considered completed. It was noted that the analytical results showed there were no remaining Tier I exceedances and the Tier II exceedances were limited to benzo(a)pyrene, dibenz(a,h)anthracene, benzene, and methylene chloride. It was also discussed that there will need to be inclusion of data relative to wildlife workers in the annual stewardship reports that will be developed at a later date. Earlier today, Dave had driven by the 600-1 project area and we agreed that though the current surface is not what will be expected for final configuration, no further contouring is necessary in association with this project.

Contact Record Prepared By: Mike Bemski

Required Distribution:

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S. Gunderson, CDPHE
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D. Mayo, K-H RISS
J. Mead, K-H ESS
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A. Primrose, K-H RISS
E. Pottorff, CDPHE
S. Tower, DOE

85

Appendix C - Wildlife Refuge Worker Action Level Comparison

IHSS Group 600-1 Wildlife Refuge Worker Action Level Comparison

Location	Analyte	Result	RL	BKG	WRW AL	Eco AL	Units
CB37-002	Benzo(a)anthracene	83	41	NA	34900	-	ug/kg
	Benzo(a)pyrene	110	99	NA	3490	-	ug/kg
	Benzo(k)fluoranthene	99	98	NA	349000	-	ug/kg
	Chrysene	110	56	NA	3490000	-	ug/kg
	Fluoranthene	220	89	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	75	51	NA	34900	-	ug/kg
	Pyrene	200	42	NA	22100000	-	ug/kg
CB37-003	Acenapthene	110	49	NA	40800000	-	ug/kg
	Anthracene	130	83	NA	204000000	-	ug/kg
	Benzo(a)anthracene	380	42	NA	34900	-	ug/kg
	Benzo(a)pyrene	410	100	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	350	110	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	390	99	NA	349000	-	ug/kg
	Chrysene	430	57	NA	3490000	-	ug/kg
	Fluoranthene	1100	90	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	240	51	NA	34900	-	ug/kg
	Pyrene	810	43	NA	22100000	-	ug/kg
CB37-005	Benzo(a)anthracene	66	40	NA	34900	-	ug/kg
	Benzo(a)pyrene	100	96	NA	3490	-	ug/kg
	Chrysene	85	54	NA	3490000	-	ug/kg
	Fluoranthene	140	86	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	74	49	NA	34900	-	ug/kg
	Pyrene	140	41	NA	22100000	-	ug/kg
CB37-006	Acenapthene	54	47	NA	40800000	-	ug/kg
	Benzo(a)anthracene	230	40	NA	34900	-	ug/kg
	Benzo(a)pyrene	250	96	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	210	100	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	220	95	NA	349000	-	ug/kg
	Chrysene	250	55	NA	3490000	-	ug/kg

Location	Analyte	Result	RL	BKG	WRW AL	Eco AL	Units
	Dibenz(a,h)anthracene	70	48	NA	3490	-	ug/kg
	Fluoranthene	630	86	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	150	49	NA	34900	-	ug/kg
	Pyrene	500	41	NA	22100000	-	ug/kg
CB37-009	Acenapthene	100	48	NA	40800000	-	ug/kg
	Anthracene	170	82	NA	204000000	-	ug/kg
	Benzo(a)anthracene	400	41	NA	34900	-	ug/kg
	Benzo(a)pyrene	400	99	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	330	100	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	350	98	NA	349000	-	ug/kg
	Chrysene	430	56	NA	3490000	-	ug/kg
	Dibenz(a,h)anthracene	92	49	NA	3490	-	ug/kg
	Fluoranthene	1200	88	NA	27200000	-	ug/kg
	Fluorene	81	80	NA	40800000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	250	50	NA	34900	-	ug/kg
	Pyrene	920	42	NA	22100000	-	ug/kg
CB37-010	Benzo(a)anthracene	55	39	NA	34900	-	ug/kg
	Chrysene	70	54	NA	3490000	-	ug/kg
	Fluoranthene	110	85	NA	27200000	-	ug/kg
	Pyrene	100	40	NA	22100000	-	ug/kg
CB37-011	Benzo(a)anthracene	44	41	NA	34900	-	ug/kg
	Fluoranthene	93	89	NA	27200000	-	ug/kg
	Pyrene	81	42	NA	22100000	-	ug/kg
CB37-019	Acenapthene	150	51	NA	40800000	-	ug/kg
	Anthracene	150	87	NA	204000000	-	ug/kg
	Benzo(a)anthracene	330	43	NA	34900	-	ug/kg
	Benzo(a)pyrene	360	100	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	270	110	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	310	100	NA	349000	-	ug/kg
	Chrysene	390	59	NA	3490000	-	ug/kg
	Dibenz(a,h)anthracene	120	52	NA	3490	-	ug/kg

Location	Analyte	Result	RL	BKG	WRW AL	Eco AL	Units
	Fluoranthene	920	94	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	270	53	NA	34900	-	ug/kg
	Pyrene	790	45	NA	22100000	-	ug/kg
CB38-001	Benzo(a)anthracene	100	40	NA	34900	-	ug/kg
	Benzo(a)pyrene	120	96	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	110	100	NA	34900	-	ug/kg
	Chrysene	120	54	NA	3490000	-	ug/kg
	Fluoranthene	230	86	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	92	49	NA	34900	-	ug/kg
	Pyrene	210	41	NA	22100000	-	ug/kg
CB38-002	2-Methylnaphthalene	19000	310	NA	20400000	-	ug/kg
	Anthracene	4800	410	NA	204000000	-	ug/kg
	Benzo(a)anthracene	5400	210	NA	34900	-	ug/kg
	Benzo(a)pyrene	4500	500	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	2000	530	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	1200	490	NA	349000	-	ug/kg
	Chrysene	9100	280	NA	3490000	-	ug/kg
	Dibenz(a,h)anthracene	1800	250	NA	3490	-	ug/kg
	Indeno(1,2,3-cd)pyrene	1500	250	NA	34900	-	ug/kg
	Naphthalene	8900	370	NA	3090000	-	ug/kg
	Pyrene	12000	210	NA	22100000	-	ug/kg
CC37-001	Bis(2-ethylhexyl)phthalate	250	73	NA	1970000	-	ug/kg
CC37-003	Acenapthene	75	49	NA	40800000	-	ug/kg
	Benzo(a)anthracene	190	42	NA	34900	-	ug/kg
	Benzo(a)pyrene	200	100	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	150	110	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	180	99	NA	349000	-	ug/kg
	Chrysene	220	57	NA	3490000	-	ug/kg
	Fluoranthene	520	89	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	130	51	NA	34900	-	ug/kg
	Pyrene	460	43	NA	22100000	-	ug/kg

Location	Analyte	Result	RL	BKG	WRW AL	Eco AL	Units
CC37-004	Benzoic acid	1100	370	NA	1000000000	-	ug/kg
CC37-006	Acenapthene	320	50	NA	40800000	-	ug/kg
	Anthracene	480	84	NA	204000000	-	ug/kg
	Benzo(a)anthracene	860	42	NA	34900	-	ug/kg
	Benzo(a)pyrene	740	100	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	590	110	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	710	100	NA	349000	-	ug/kg
	Bis(2-ethylhexyl)phthalate	150	74	NA	1970000	-	ug/kg
	Chrysene	920	57	NA	3490000	-	ug/kg
	Fluoranthene	2600	90	NA	27200000	-	ug/kg
	Fluorene	270	82	NA	40800000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	450	52	NA	34900	-	ug/kg
	Pyrene	2100	43	NA	22100000	-	ug/kg
CC37-008	Benzo(a)anthracene	150	40	NA	34900	-	ug/kg
	Benzo(a)pyrene	180	97	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	130	100	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	160	96	NA	349000	-	ug/kg
	Chrysene	180	55	NA	3490000	-	ug/kg
	Fluoranthene	390	86	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	120	49	NA	34900	-	ug/kg
	Pyrene	360	41	NA	22100000	-	ug/kg
CC37-009	Pyrene	77	42	NA	22100000	-	ug/kg
CC37-012	Benzo(a)anthracene	130	47	NA	34900	-	ug/kg
	Benzo(a)pyrene	150	61	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	130	76	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	130	82	NA	349000	-	ug/kg
	Chrysene	150	41	NA	3490000	-	ug/kg
	Fluoranthene	370	47	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	94	53	NA	34900	-	ug/kg
	Pyrene	340	67	NA	22100000	-	ug/kg
CC37-014	Bis(2-ethylhexyl)phthalate	140	82	NA	1970000	-	ug/kg

Location	Analyte	Result	RL	BKG	WRW AL	Eco AL	Units
	Butyl benzylphthalate	310	75	NA	147000000	-	ug/kg
	Chrysene	41	40	NA	3490000	-	ug/kg
	Fluoranthene	72	46	NA	27200000	-	ug/kg
	Pyrene	73	65	NA	22100000	-	ug/kg
CC37-016	2-Methylnaphthalene	130	41	NA	20400000	-	ug/kg
	Acenapthene	590	52	NA	40800000	-	ug/kg
	Anthracene	630	75	NA	204000000	-	ug/kg
	Benzo(a)anthracene	1100	45	NA	34900	-	ug/kg
	Benzo(a)pyrene	1200	59	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	950	73	NA	34900	-	ug/kg
CC37-016	Benzo(k)fluoranthene	1100	79	NA	349000	-	ug/kg
	Chrysene	1200	39	NA	3490000	-	ug/kg
	Dibenz(a,h)anthracene	340	72	NA	3490	-	ug/kg
	Dibenzofuran	220	58	NA	2950000	-	ug/kg
	Fluoranthene	3000	45	NA	27200000	-	ug/kg
	Fluorene	430	63	NA	40800000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	780	51	NA	34900	-	ug/kg
	Naphthalene	380	49	NA	3090000	-	ug/kg
	Pentachlorophenol	410	74	NA	162000	-	ug/kg
	Pyrene	2600	65	NA	22100000	-	ug/kg
CC37-018	Benzo(a)anthracene	58	41	NA	34900	-	ug/kg
	Chrysene	65	56	NA	3490000	-	ug/kg
	Fluoranthene	150	88	NA	27200000	-	ug/kg
	Pyrene	100	42	NA	22100000	-	ug/kg
CC37-020	Pyrene	100	41	NA	22100000	-	ug/kg
CC37-024	Butyl benzylphthalate	310	70	NA	147000000	-	ug/kg
CC38-001	Benzo(a)anthracene	150	41	NA	34900	-	ug/kg
	Benzo(a)pyrene	170	99	NA	3490	-	ug/kg
	Benzo(b)fluoranthene	140	110	NA	34900	-	ug/kg
	Benzo(k)fluoranthene	150	98	NA	349000	-	ug/kg
	Chrysene	190	56	NA	3490000	-	ug/kg

Location	Analyte	Result	RL	BKG	WRW AL	Eco AL	Units
	Fluoranthene	370	89	NA	27200000	-	ug/kg
	Indeno(1,2,3-cd)pyrene	120	51	NA	34900	-	ug/kg
	Pyrene	360	42	NA	22100000	-	ug/kg
	Acetone	5.256427	130	NA	102000000	211000	ug/kg
CC38-002	Benzo(a)anthracene	55	41	NA	34900	-	ug/kg
	Chrysene	70	55	NA	3490000	-	ug/kg
	Fluoranthene	140	87	NA	27200000	-	ug/kg
	Pyrene	140	42	NA	22100000	-	ug/kg
TBD	Americium-241	720	4	NA	76	-	ug/kg
TBD	Plutonium-239/240	3600	0	NA	50	-	ug/kg
CB37-006	Benzene	230		NA	205000	-	ug/kg
	Benzo(a)anthracene	49	46	NA	34900	-	ug/kg
	Fluoranthene	120	98	NA	27200000	-	ug/kg
	Pyrene	94	47	NA	22100000	-	ug/kg
CB37-013	Benzo(a)anthracene	64	45	NA	34900	-	ug/kg
	Bis(2-ethylhexyl)phthalate	300	80	NA	1970000	-	ug/kg
	Chrysene	81	62	NA	3490000	-	ug/kg
	Fluoranthene	160	97	NA	27200000	-	ug/kg
	Pyrene	140	46	NA	22100000	-	ug/kg
CC37-004	Anthracene	220	70	NA	204000000	-	ug/kg
	Fluoranthene	230	42	NA	27200000	-	ug/kg
	Pyrene	220	61	NA	22100000	-	ug/kg
	Tetrachloroethene	1.118467	6.1	NA	615000	-	ug/kg
	Toluene	0.835778	6.1	NA	31300000	329000	ug/kg
CC37-007	Tetrachloroethene	1.084334	6	NA	615000	-	ug/kg
	Toluene	1.060238	6	NA	31300000	329000	ug/kg
CC37-009	Toluene	0.60982	5.3	NA	31300000	329000	ug/kg
CC37-014	Methylene chloride	1.9	0.92	NA	2530000	40	ug/kg
CC37-021	Pyrene	44	44	NA	22100000	-	ug/kg
	Benzo(a)anthracene	52	48	NA	34900	-	ug/kg
	Chrysene	130	66	NA	3490000	-	ug/kg

Location	Analyte	Result	RL	BKG	WRW AL	Eco AL	Units
	Pyrene	77	49	NA	22100000	-	ug/kg
CC37-022	Chrysene	93	60	NA	3490000	-	ug/kg
CC37-022	Acetone	19.74799	110	NA	102000000	211000	ug/kg
CC37-023	Methylene chloride	1.8	0.87	NA	2530000	40	ug/kg
CC37-024	Methylene chloride	2.1	0.96	NA	2530000	40	ug/kg

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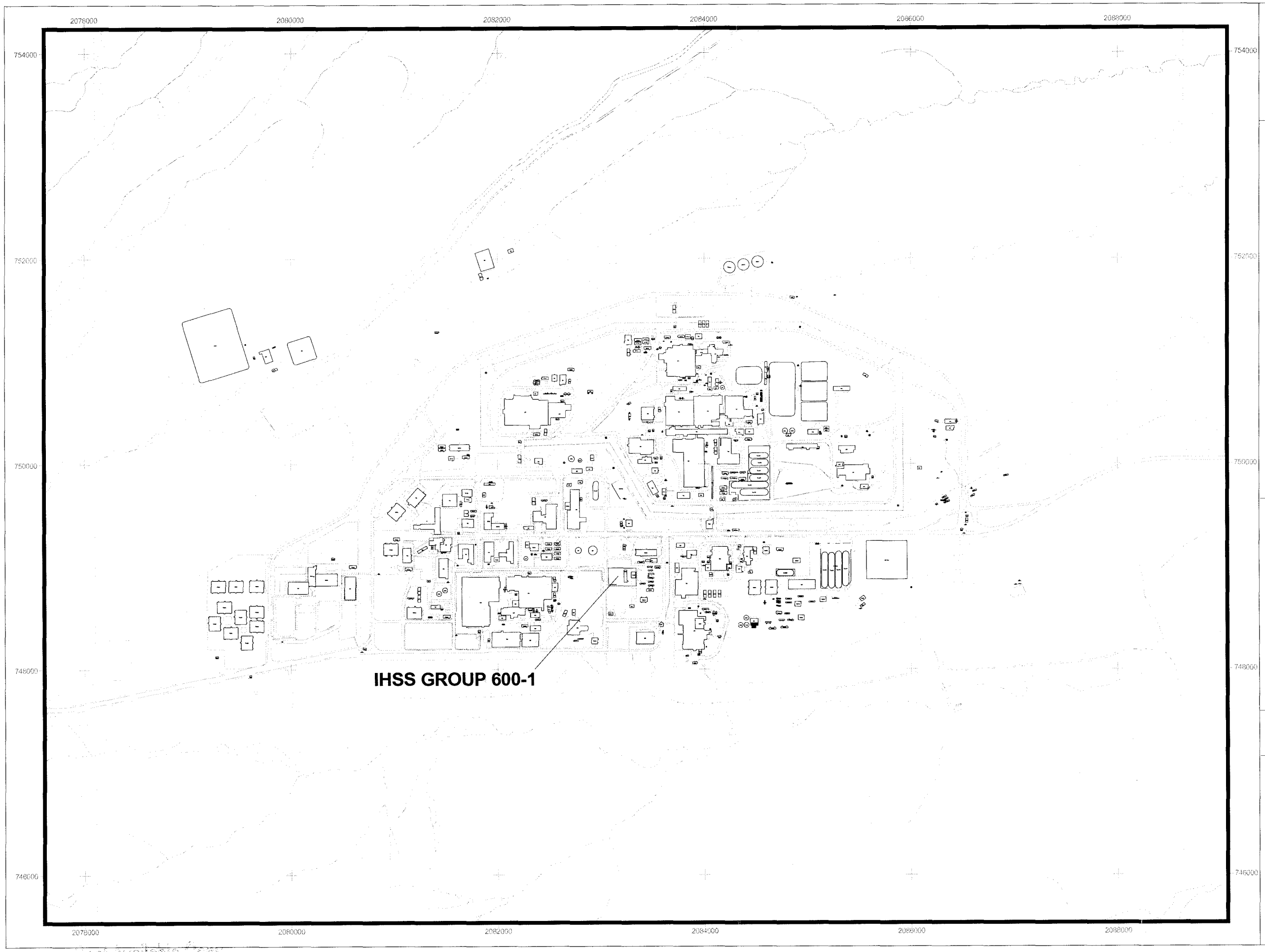

Figure 1
IHSS Group 600-1
Location Map

KEY

- PAC
- Building
- Paved area
- Dirt road
- Stream, ditch, or other drainage
- Fence

N

500 0 500 1000 Feet

Scale = 1:11,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

Prepared by:

KAISER•HILL COMPANY

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November 2002

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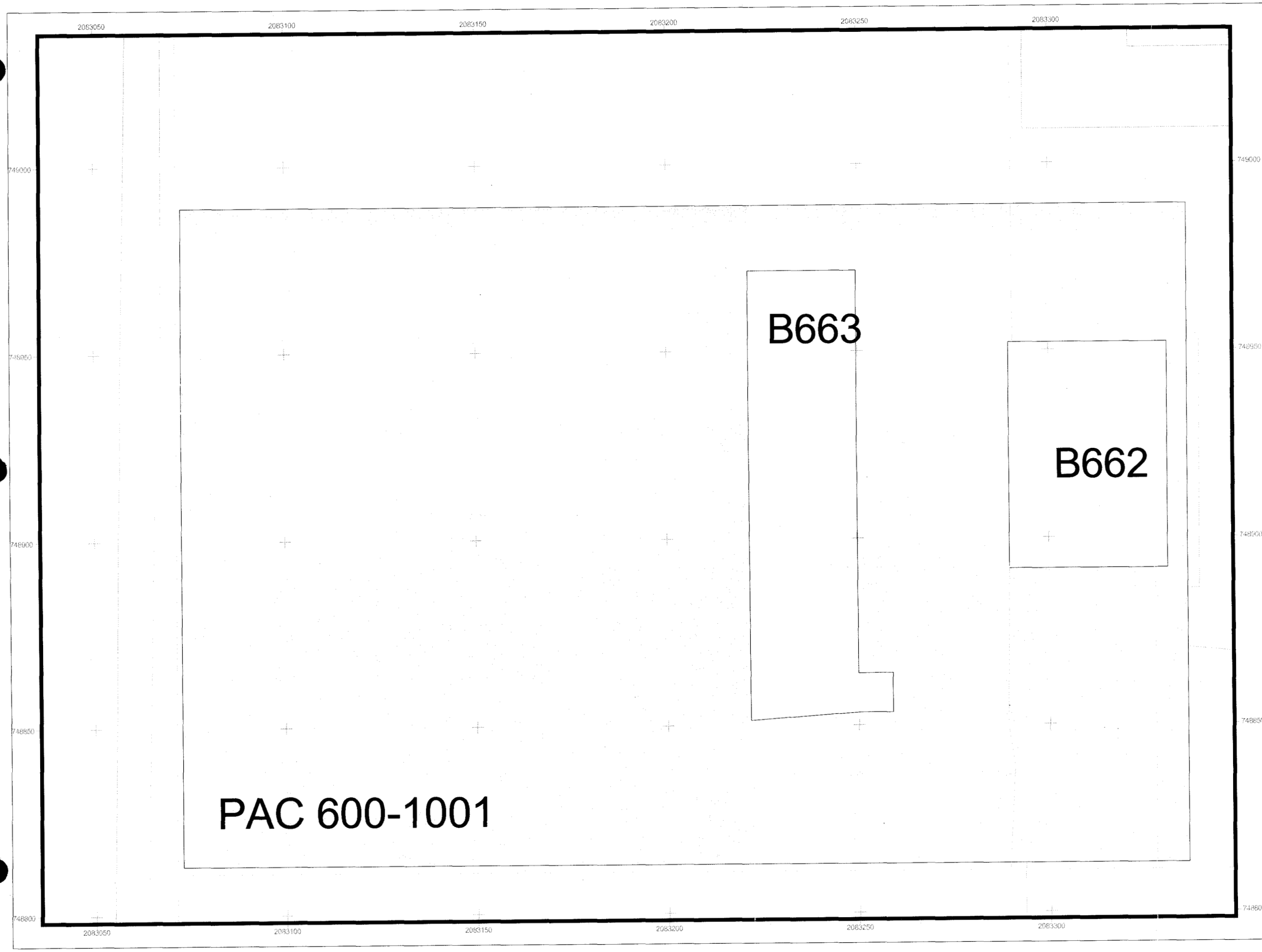

Figure 2
IHSS Group 600-1

KEY

- PAC
- Building
- Paved area
- Dirt road
- Stream, ditch, or other drainage
- Fence

N

10 0 10 20 Feet

Scale = 1:300

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

Prepared by:

KAISER•HILL COMPANY

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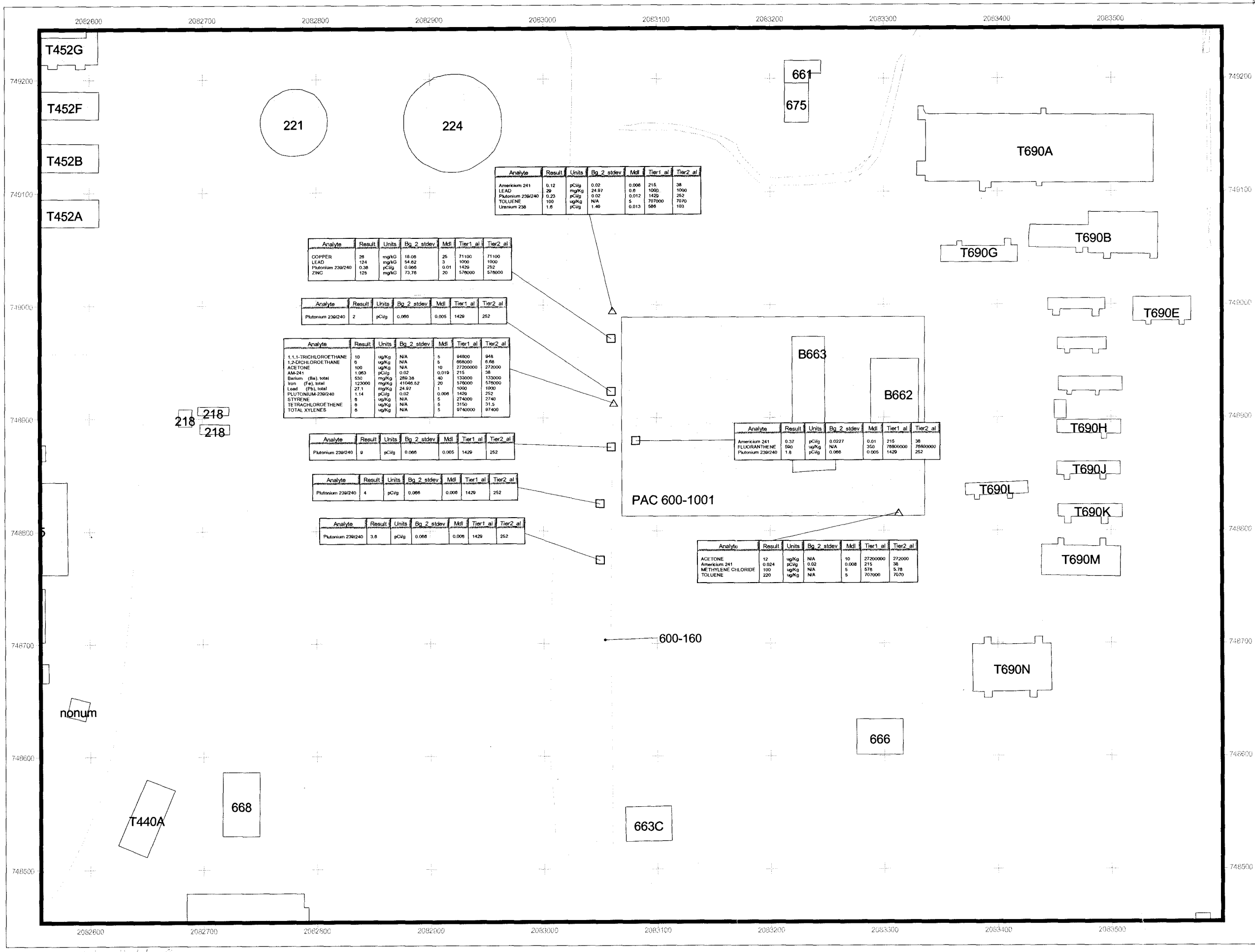

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
Americium 241	0.12	pCi/g	0.02	0.008	215	38
LEAD	29	mg/Kg	24.97	0.6	1000	1000
Plutonium 239/240	0.23	pCi/g	0.02	0.012	1429	252
TOLUENE	100	ug/Kg	N/A	5	707000	7070
Uranium 238	1.6	pCi/g	1.46	0.013	586	103

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
COPPER	26	mg/kG	18.06	25	71100	71100
LEAD	124	mg/kG	54.82	3	1000	1000
Plutonium 239/240	0.38	pCi/g	0.066	0.01	1429	252
ZINC	125	mg/kG	73.76	20	576000	576000

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
Plutonium 239/240	2	pCi/g	0.066	0.005	1429	252

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
1,1,1-TRICHLOROETHANE	10	ug/Kg	N/A	5	94800	948
1,2-DICHLOROETHANE	6	ug/Kg	N/A	5	668000	6.68
ACETONE	100	ug/Kg	N/A	10	27200000	272000
AM-241	1.063	pCi/g	0.02	0.019	215	38
Barium (Ba), total	530	mg/Kg	289.38	40	133000	133000
Iron (Fe), total	123000	mg/Kg	41049.52	20	576000	576000
Lead (Pb), total	27.1	mg/Kg	24.97	1	1000	1000
PLUTONIUM-239/240	1.14	pCi/g	0.02	0.008	1429	252
STYRENE	5	ug/Kg	N/A	5	274000	2740
TETRACHLOROETHENE	6	ug/Kg	N/A	5	3150	31.5
TOTAL XYLENES	6	ug/Kg	N/A	5	9740000	97400

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
Plutonium 239/240	9	pCi/g	0.066	0.005	1429	252

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
Plutonium 239/240	4	pCi/g	0.066	0.008	1429	252

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
Plutonium 239/240	3.6	pCi/g	0.066	0.006	1429	252

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
Americium 241	0.37	pCi/g	0.0227	0.01	215	38
FLUORANTHENE	590	ug/Kg	N/A	350	76800000	76800000
Plutonium 239/240	1.8	pCi/g	0.066	0.005	1429	252

Analyte	Result	Units	Bg_2_stdev	Mdl	Tier1_al	Tier2_al
ACETONE	12	ug/Kg	N/A	10	27200000	272000
Americium 241	0.024	pCi/g	0.02	0.008	215	38
METHYLENE CHLORIDE	100	ug/Kg	N/A	5	578	5.78
TOLUENE	220	ug/Kg	N/A	5	707000	7070

Figure 3
Location of Existing Sampling Locations With Results Greater Than Background Mean Plus Two Standard Deviations or Method Detection Limits

KEY

- PAC
- Building
- Paved area
- Dirt road
  Stream, ditch, or other drainage

Existing sampling location

- △ Subsurface soil
- □ Surface soil

N

50 0 50 100 Feet

Scale = 1:1,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

Prepared by:

KAISER•HILL COMPANY

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November 2002

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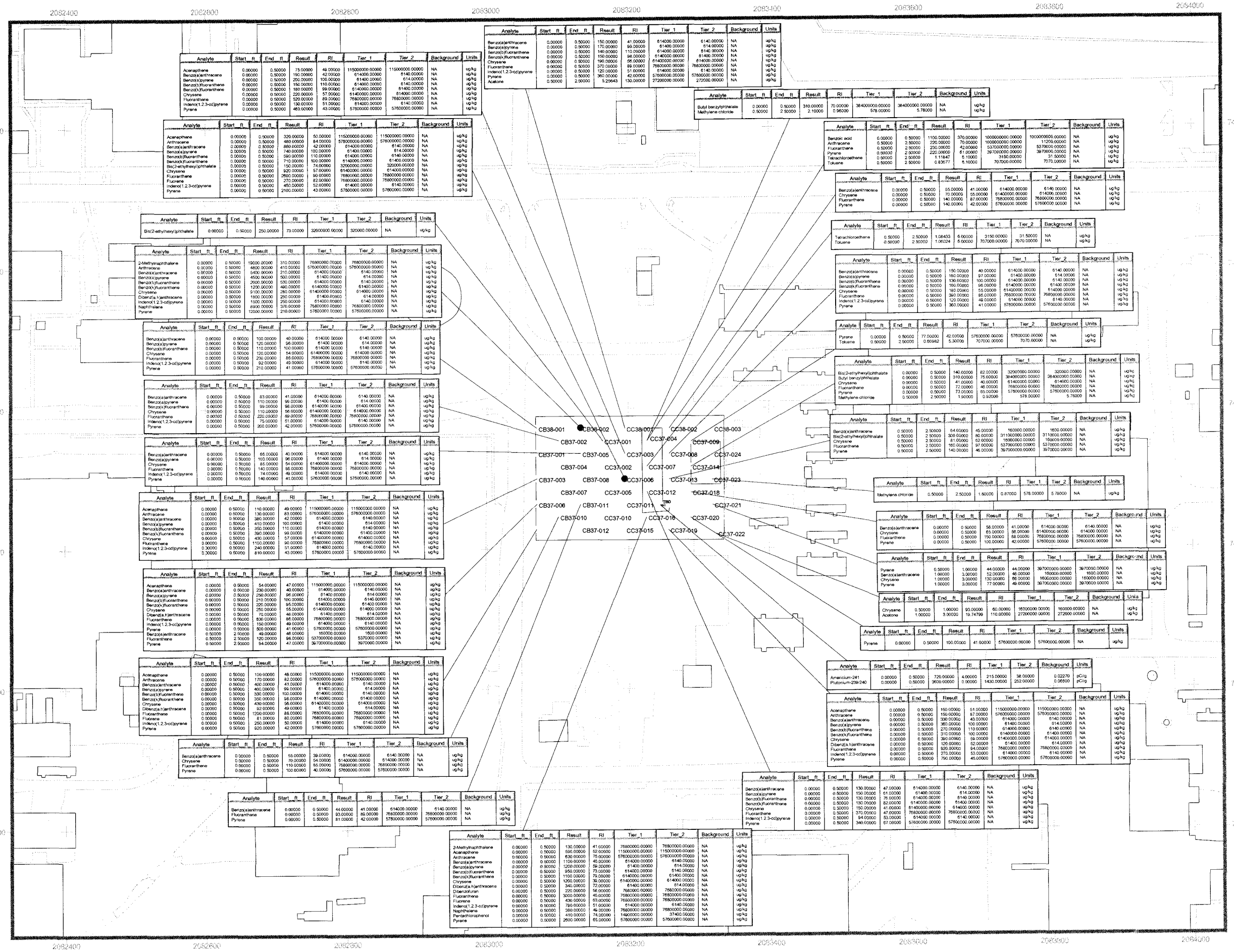
Figure 4
Characterization Sampling Locations and Results Greater Than Background Means Plus Two Standard Deviations and Method Detection Limits IHSS Group 600-1



KEY

- PAC
- Building
- Paved area
- Dirt road
- Stream, ditch, or dranage
- Tier 1 Exceedance
- ● Tier 2 Exceedance Greater Than Background or MDL
- Less Than Background or MDL

N

40 0 40 80 Feet

Scale = 1:1,650

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by:

KAISER•HILL COMPANY

projects/2003/600-1/closeout/600-1samplingact.apr

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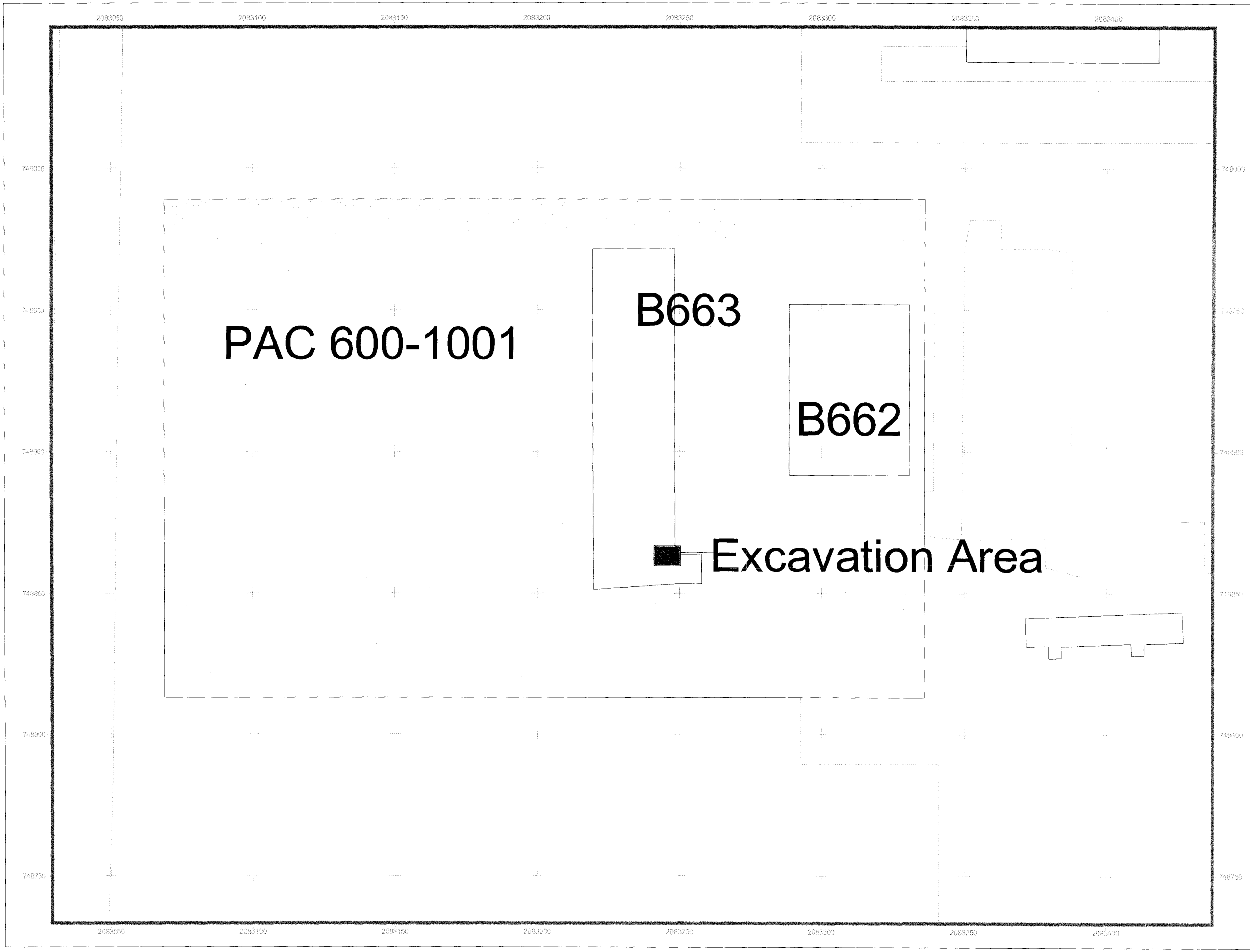

Figure 5
Excavation Area
IHSS Group 600-1

KEY

- PAC
- Building
- Paved area
- Dirt road
- Stream, ditch, or dranage

N

10 0 10 20 Feet

Scale = 1:500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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35

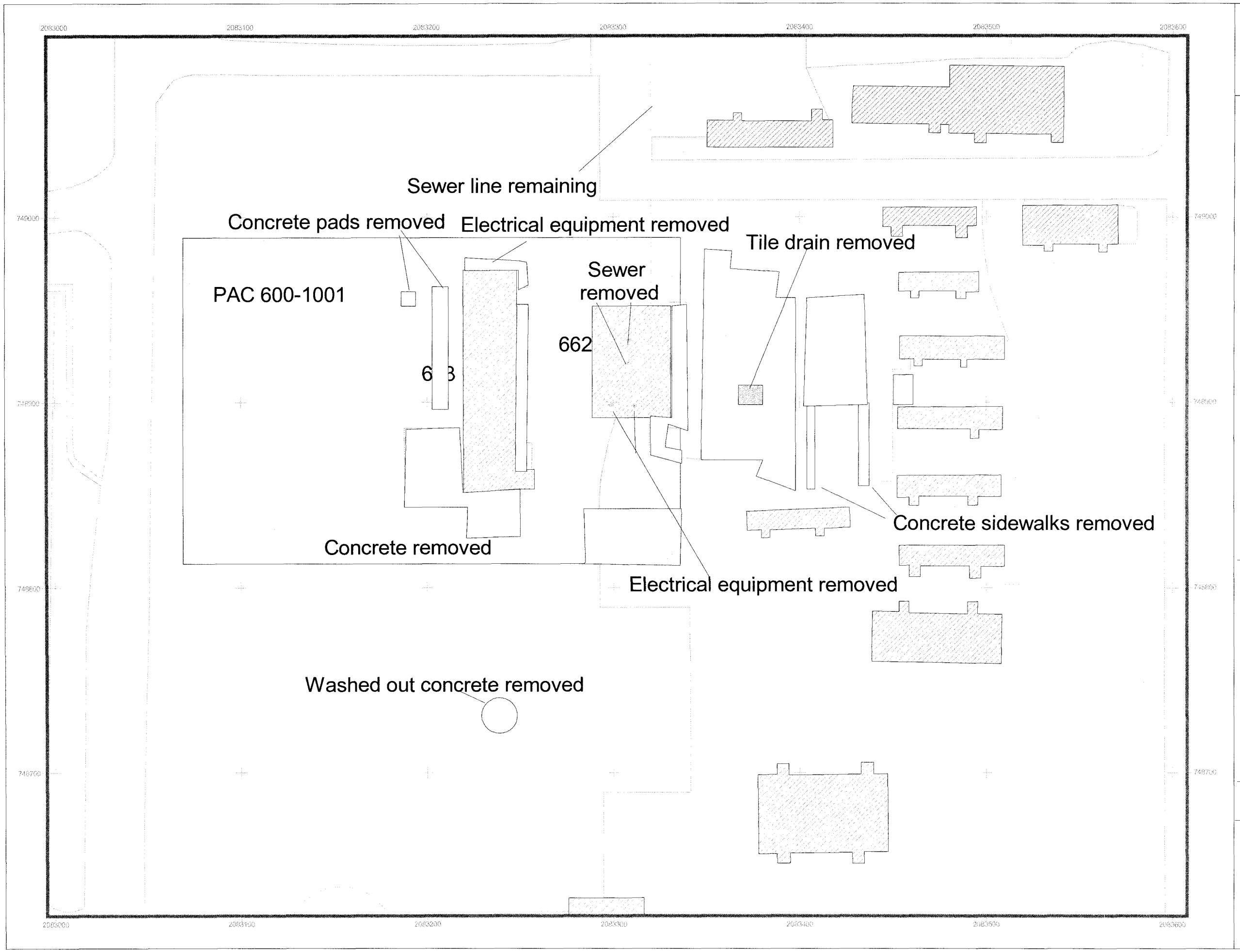

Figure 6
IHSS Group 600-1
Structures and Features Removed

KEY

PAC

Building

Demolished

Standing

Paved area

Sewer line

Dirt road

Stream, ditch, or dranage

Concrete removed

Asphalt left in place

Features removed

Features removed

N

20 0 20 40 Feet

Scale = 1:600

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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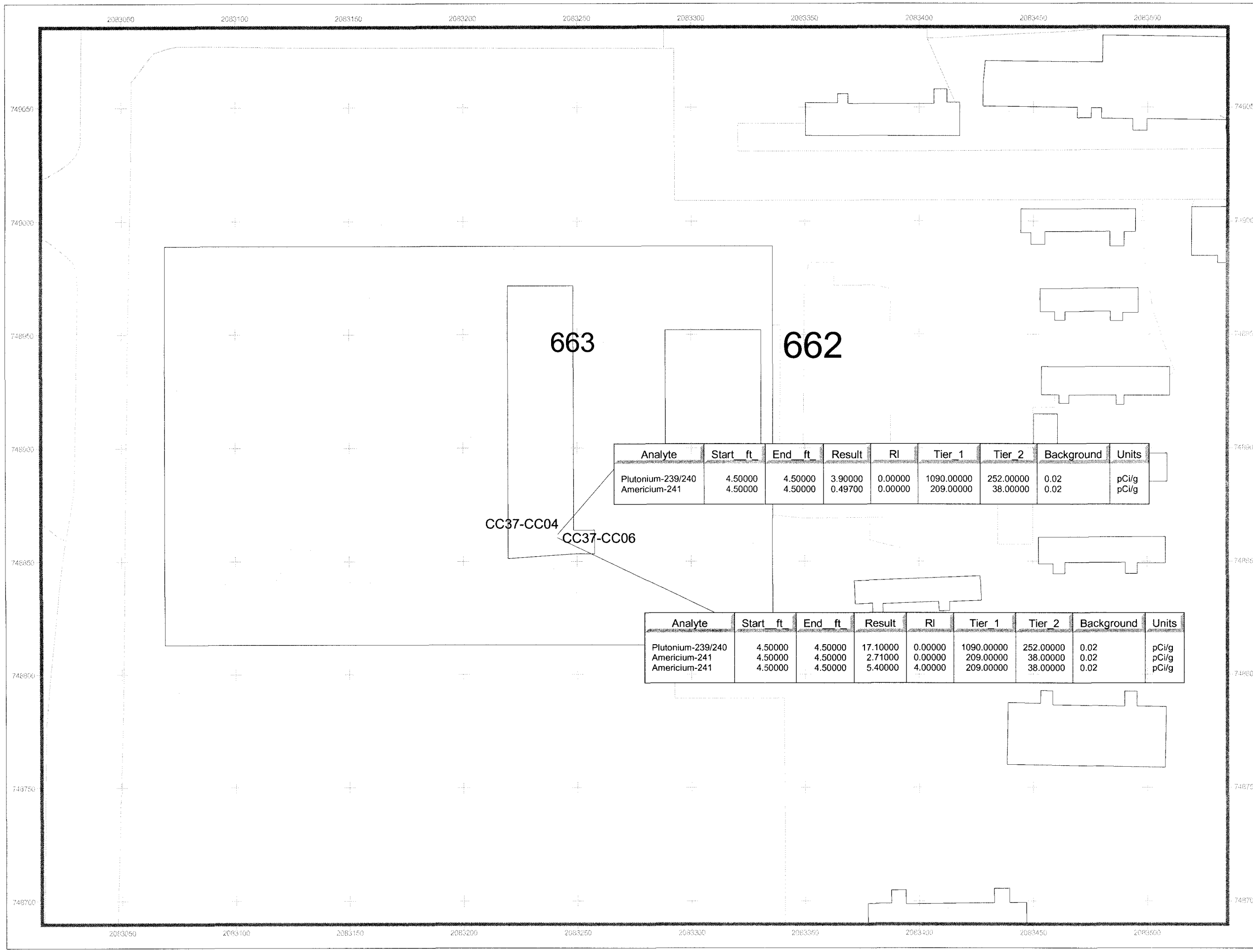
36



Analyte	Start ft	End ft	Result	RI	Tier 1	Tier 2	Background	Units
Plutonium-239/240	4.50000	4.50000	3.90000	0.00000	1090.00000	252.00000	0.02	pCi/g
Americium-241	4.50000	4.50000	0.49700	0.00000	209.00000	38.00000	0.02	pCi/g

Analyte	Start ft	End ft	Result	RI	Tier 1	Tier 2	Background	Units
Plutonium-239/240	4.50000	4.50000	17.10000	0.00000	1090.00000	252.00000	0.02	pCi/g
Americium-241	4.50000	4.50000	2.71000	0.00000	209.00000	38.00000	0.02	pCi/g
Americium-241	4.50000	4.50000	5.40000	4.00000	209.00000	38.00000	0.02	pCi/g

Figure 7
Confirmation Sampling Results Greater Than Background Means Plus Two Standard Deviations or Method Detection Limits IHSS Group 600-1

KEY

- PAC
- Building
- Paved area
- Dirt road
- Stream, ditch, or dranage
- Greater Than Background or MDL

N

10 0 10 20 30 40 Feet

Scale = 1:500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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37

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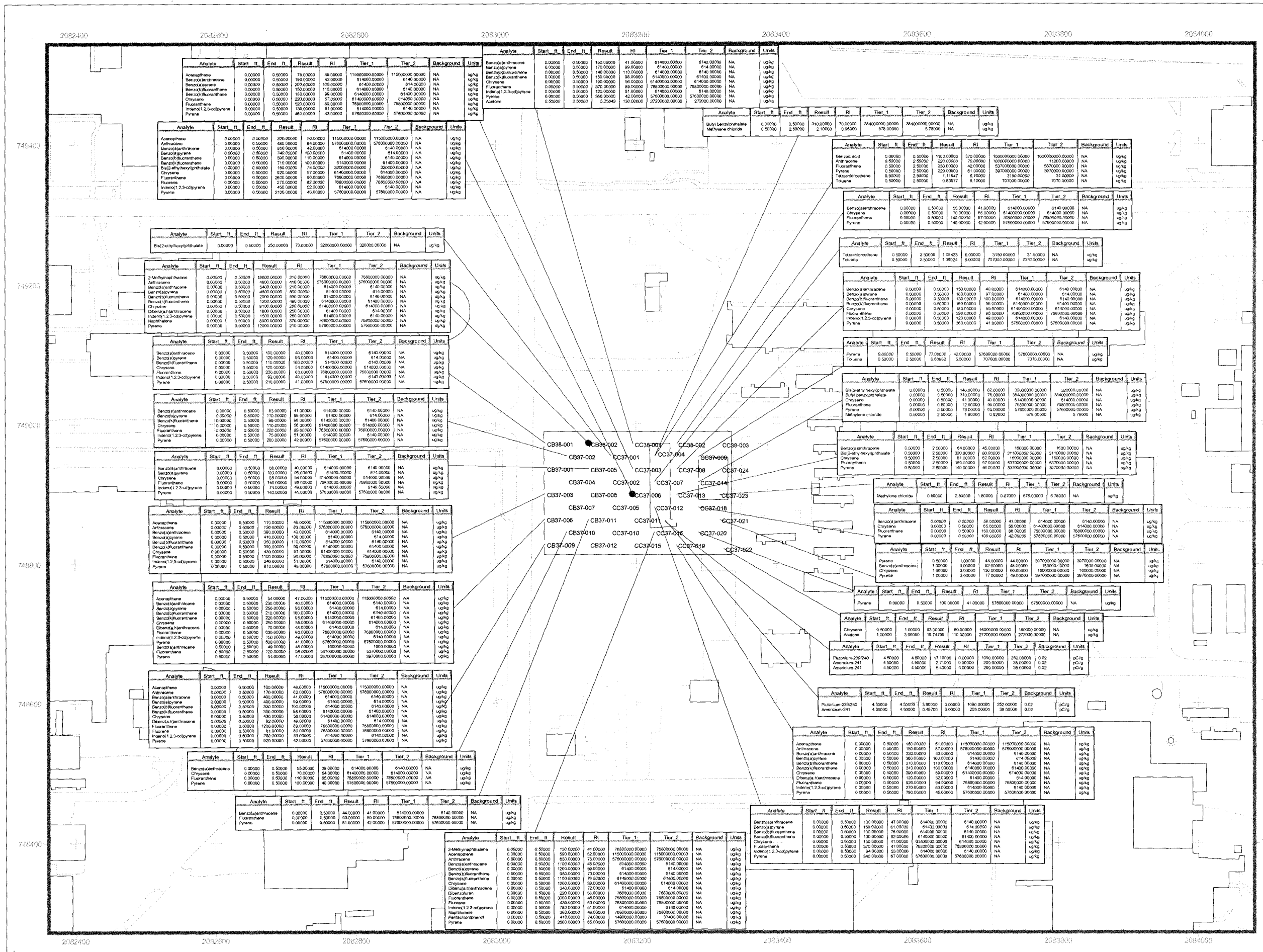

Figure 8
Residual Contamination
IHSS Group 600-1

KEY

- PAC
- Building
- Paved area
- Dirt road
- Stream, ditch, or dranage
- Tier 2 Exceedance
  - Greater Than Background or MDL
  - Less Than Background or MDL

N

40 0 40 80 Feet

Scale = 1:1,650

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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