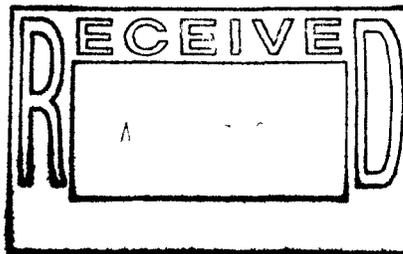




**Closeout Report
For IHSS Group 900-1**

UBC 991, IHSS 900-173, IHSS 900-184,
PAC 900-1301 and PAC 900-1307



April 2004

IA-A-002056

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**Closeout Report
For IHSS Group 900-1**

UBC 991, IHSS 900-173, IHSS 900-184,
PAC 900-1301 and PAC 900-1307

Approval received from the Colorado Department of Public Health and Environment
March 31, 2004

Approval letter contained in the Administrative Record

April 2004

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ENCLOSURE

Normalized Data Set Compact Disc

ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
AR	Administrative Record
CDPHE	Colorado Department of Public Health and Environment
CHWA	Colorado Hazardous Waste Act
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
D&D	Decontamination and Decommissioning
DOE	U S Department of Energy
DQA	Data Quality Assessment
DQO	data quality objective
EPA	U S Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
ft	foot
FY	Fiscal Year
GS	gauging station
HPGe	high-purity germanium
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
K-H	Kaiser-Hill
LCS	laboratory control sample
LLW	low-level radioactive waste
ug/kg	micrograms per kilogram
ug/L	micrograms per liter
MDL	method detection limit
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
N/A	not applicable
NFAA	No Further Accelerated Action
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability and sensitivity
pCi/g	picocuries per gram
QC	quality control
R&D	research and development
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RI/FS	Remedial Investigation/Feasibility Study
RISS	Remediation and Industrial Site Services
RL	reporting limit
RPD	relative percent difference
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
Site	Rocky Flats Environmental Technology Site

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SOR sum of ratios
SSRS Subsurface Soil Risk Screen
SWD Soil Water Database
UBC Under Building Contamination
V&V verification and validation
VOC volatile organic compound
WRW wildlife refuge worker

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EXECUTIVE SUMMARY

This Closeout Report summarizes accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 900-1, which is located at the Rocky Flats Environmental Technology Site (RFETS). Activities were planned and executed in accordance with the Industrial Area Sampling and Analysis Plan (IASAP), IASAP Addendum #IA-03-03, and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol for Routine Soil Remediation (ER RSOP). Notification of the planned characterization and removal activities was provided in ER RSOP Notification #03-05.

Activities were conducted between February 4, 2003 and January 13, 2004, and included characterization of the entire IHSS Group and the removal of the Building 993 slab and pit. Characterization analytical results indicate that all soil and sediment concentrations are less than the RFCA wildlife refuge worker (WRW) action levels (ALs), except for one surface soil and two subsurface soil arsenic concentrations. The elevated arsenic concentrations also exceeded the ecological receptor AL. In addition, twelve lead concentrations in surface soil, two lead concentrations in subsurface soil, three lead concentrations in sediment, and one beryllium concentration in sediment exceeded ecological receptor ALs. Results of the data quality assessment confirmed that the data collected and used are adequate for decision making.

No soil was removed based on the characterization data and the Subsurface Soil Risk Screen conducted as part of this accelerated action. The elevated arsenic concentration in surface soil was 25.2 milligrams per kilogram (mg/kg), and the elevated arsenic concentrations in subsurface soil were 25.1 and 40 mg/kg. The WRW AL is 22.2 mg/kg. The 40 mg/kg arsenic concentration was detected at a depth of more than 20 feet below ground surface, beneath the Building 998 vault. The potential ecological risk associated with arsenic, beryllium and lead concentrations in soil and sediment that were greater than the ecological receptor ALs will be evaluated in the Accelerated Action Ecological Screening Evaluation and the ecological portion of the Sitewide Comprehensive Risk Assessment (CRA). Surface water and groundwater in the area will continue to be monitored under the Integrated Monitoring Program.

Removal activities were consistent with and contributed to the ER RSOP overall long-term remedial action objectives for RFETS soil. The removal of the Building 993 slab and pit contributed to the protection of human health and the environment, because potential sources of contamination were removed. These actions also minimized the need for long-term maintenance and institutional or engineering controls. Best management practices were used 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.

No IHSS Group-specific, near-term management techniques are required because of environmental conditions. Excavation at the IHSS Group will continue to be controlled through the Site Soil Disturbance Permit process. Access will be restricted to minimize disturbance to newly revegetated areas. Site access 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, and semi-volatile organic compounds in soil will be analyzed in the Sitewide CRA, which is part of the Remedial Investigation/Feasibility Study (RI/FS) that will be conducted for the Site. The need for and extent of any more general, long-term stewardship activities will also be analyzed in the RI/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will be contained in the Corrective Action Decision/Record of Decision, any post-closure Colorado Hazardous Waste Act permit that may be required, and any post-RFCA agreement.

No long-term stewardship activities are recommended for IHSS Group 900-1 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the Industrial Area, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS Group 900-1.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record file. 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) site. An NFAA decision is justified based on the following:

- No further accelerated action required based on soil data,
- No further accelerated action required based on the Subsurface Soil Risk Screen, and
- No further accelerated action required based on the stewardship evaluation.

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

1.0 INTRODUCTION

This Closeout Report summarizes the characterization and accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 900-1 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group 900-1 consists of the following IHSS, Potential Area of Concern (PAC), and Under Building Contamination (UBC) sites

- UBC 991, Weapons Assembly and Research and Development (R&D),
- IHSS 900-173, Radioactive Site Building 991,
- IHSS 900-184, Radioactive Site 991 Steam Cleaning Area, and
- PAC 900-1301, Building 991 Enclosed Area

Characterization and accelerated actions were also conducted at PAC 900-1307, Explosive Bonding Pit. The location of IHSS Group 900-1 is shown on Figure 1, and the IHSS, PAC and UBC sites are shown on Figure 2

Accelerated action activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) (DOE 2001), IASAP Addendum #IA-03-03 (DOE 2003a), and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003b). Notification of the planned activities was provided in ER RSOP Notification #03-05 (DOE 2003c), which was approved by the Colorado Department of Public Health and Environment (CDPHE) on January 30, 2003 (CDPHE 2003)

This report contains the information necessary to demonstrate attainment of cleanup objectives and closure of IHSS Group 900-1. 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 dates and duration of specific activities, and
 - Photographs documenting site characterization, remediation, and reclamation activities,
- Description of Resource Conservation and Recovery Act (RCRA) unit closure activities,

- Description of the Subsurface Soil Risk Screen (SSRS),
- Description of near-term stewardship actions and long-term stewardship recommendations,
- Disposition of wastes,
- Site reclamation, and
- Data quality assessment (DQA), including comparison of confirmation data with project data quality objectives (DQOs)

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

2.0 SITE CHARACTERIZATION

IHSS Group 900-1 characterization information consists of historical knowledge and analytical data. Historical information for the IHSSs was derived from previous studies (DOE 1992-2003, DOE 2000a, DOE 2001) and is summarized below in Sections 2.1 through 2.5. Analytical data for IHSS Group 900-1 (pre-accelerated action and accelerated action data) are summarized in Sections 2.6 and 2.7, respectively. A compact disc that contains the normalized accelerated action data set, including quality assurance and quality control data, is enclosed with this report.

Accelerated action analytical data were collected in accordance with IASAP Addendum #IA-03-03 (DOE 2003a). Sampling specifications, including media sampled, depth intervals, and analytes, are presented in Table 1. Deviations from the IASAP Addendum are also presented and explained in Table 1. A summary of planned and actual sampling and analysis is presented in Table 2. The total number of samples collected and the related number of analyses were less than the total numbers planned because the second depth interval at two sampling locations could not be sampled because of sampling refusal. The Building 991 slab is situated in weathered bedrock (EG&G 1995). In addition, one planned explosives analysis was not conducted based on analytical results from other locations (Section 2.7).

Table 1
Deviations from IASAP Addendum #IA-03-03

Location Code	Proposed Easting	Proposed Northing	Actual Easting	Actual Northing	Soil Media	Proposed Depth Interval (ft)	Actual Depth Interval (ft)	Analyte	Comment
CL43-000	2084720 626	750085 562	2084720 626	750085 562	Subsurface	00-0.5 0.5-2.5	00-0.5 0.5-1.5	Radionuclides Metals VOCs	Biased location under tunnel, no significant change Second interval depth not achieved due to refusal
CL43-004	2084967 677	750086 897	2084967 677	750086 897	Subsurface	00-0.5 0.5-2.5	1.4-1.9 1.9-3.9	Radionuclides Metals VOCs	Biased location under tunnel, no significant change First interval started deeper due to the presence of gravel or fill
CM42-001	2085293 745	749869 735	2085293 748	749869 732	Surface Subsurface	00-0.5 0.5-2.5	0.4-0.9 0.9-1.7	Radionuclides Metals VOCs	Statistical location, no significant change First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to sampling refusal
CM42-004	2085293 557	749941 734	2085293 523	749941 839	Surface Subsurface	00-0.5 0.5-2.5	0.5-1.0 1.0-2.0	Radionuclides Metals VOCs	Statistical location, no significant change Second interval depth not achieved due to refusal
CM42-005	2085319 287	749866 516	2085309 282	749898 676	Surface Subsurface	00-0.5 0.5-2.5	00-0.5 0.5-2.5	Radionuclides Metals VOCs (subsurface only)	Statistical location relocated 10 ft west and 32 ft north to better characterize the soil adjacent to the storm drain running through IHSS 173
CM42-006	2085332 371	749799 346	2085332 386	749799 349	Surface Subsurface	00-0.5 0.5-2.5	2.5-4.5	Radionuclides Metals VOCs (subsurface only)	Statistical location, no significant change Only one interval sampled to target storm drain
CM42-007	2085329 506	749835 232	2085329 513	749835 207	Surface Subsurface	00-0.5 0.5-2.5	00-0.5 0.5-2.5	Radionuclides Metals VOCs (subsurface only)	Statistical location, no significant change
CM42-008	2085299 861	749814 807	2085299 849	749814 810	Surface Subsurface	00-0.5 0.5-2.5	00-0.5 0.5-2.5	Radionuclides Metals VOCs (subsurface only)	Statistical location, no significant change
CM42-009	2085296 995	749850 693	2085297 016	749850 707	Surface Subsurface	00-0.5 0.5-2.5	00-0.5 0.5-2.5	Radionuclides Metals VOCs (subsurface only)	Statistical location, no significant change

Closeout Report for IHSS Group 900-1

Location Code	Proposed Easting	Proposed Northing	Actual Easting	Actual Northing	Soil Media	Proposed Depth Interval (ft)	Actual Depth Interval (ft)	Analyte	Comment
CM42-010	2085313 456	749765 795	2085313 465	749765 827	Subsurface	2 5 - 4 5	2 5 - 4 5	Radionuclides Metals VOCs	Biased location to target storm drain lines, no significant change
CM42-011	2085320 154	749789 239	2085320 104	749789 254	Subsurface	2 5 - 4 5	2 5 - 4 5	Radionuclides Metals VOCs	Biased location to target storm drain line, no significant change
CM42-012	2085330 201	749816 869	2085330 238	749816 867	Sediment	0 0 - 0 0	0 0 - 0 5	Radionuclides Metals	Biased location to sample sediment in storm drain, no significant change
CM42-013	2085281 639	749780 029	2085281 681	749780 004	Subsurface	2 5 - 4 5	2 5 - 4 5	Radionuclides Metals VOCs	Biased location to target storm and foundation drain lines, no significant change
CM42-014	2085281 639	749950 832	2085276 479	749937 396	Subsurface	2 5 - 4 5	2 5 - 4 5	Radionuclides Metals VOCs	Biased location to target storm and foundation drain lines, relocated 5 ft west and 23 ft south to sample adjacent to drains as intended
CM43-000	2085324 340	749967 577	2085305 174	749960 738	Subsurface	2 5 - 4 5	2 5 - 4 5	Radionuclides Metals VOCs	Biased location to target storm and foundation drain lines, relocated 19 ft west and 7 ft south to sample adjacent to drains as intended
CM43-001	2085277 492	750084 226	2085277 492	750084 226	Subsurface	0 0 - 0 5 0 5 - 2 5	0 6 - 1 1 1 1 - 2 6	Radionuclides Metals VOCs	Biased location under tunnel, no significant change First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal
CM43-002	2085306 871	749962 704	2085306 871	749962 704	Subsurface	0 0 - 0 5 0 5 - 2 5	0 8 - 1 3 1 3 - 2 3	Radionuclides Metals VOCs	Biased location under tunnel, no significant change First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal
CN41-000	2085489 283	749743 189	2085489 284	749743 193	Sediment	0 0 - 0 0	0 0 - 0 5	Radionuclides Metals	Biased location to sample sediment in culvert, no significant change
CN42-005	2085480 712	749906 222	2085454 000	750048 000	Subsurface	0 0 - 0 5 0 5 - 2 5	0 5 - 1 0 1 0 - 1 5	Radionuclides Metals VOCs	Statistical location, actual coordinates are estimated First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal
CN42-007	2085418 452	749870 059	2085418 000	749870 000	Subsurface	0 0 - 0 5 0 5 - 2 5	0 7 - 1 2 1 2 - 1 7	Radionuclides Metals VOCs	Statistical location, no significant change First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal

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Location Code	Proposed Easting	Proposed Northing	Actual Easting	Actual Northing	Soil Media	Proposed Depth Interval (ft)	Actual Depth Interval (ft)	Analyte	Comment
CN42-015	2085418 265	749942 059	2085406 000	750023 000	Subsurface	0 0-0 5 0 5-2 5	0 5-1 0 1 0-1 5	Radionuclides Metals VOCs	Statistical location, actual coordinates are estimated First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal Statistical location relocated off dock 33 ft west and 5 ft north to better characterize the soil adjacent to the storm drain running through IHSS 173 First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal
CN42-017	2085356 005	749905 897	2085323 547	749910 461	Surface Subsurface	0 0-0 5 0 5-2 5	0 5-1 0 1 0-2 0	Radionuclides Metals VOCs	Statistical location relocated 47 ft west and 45 ft north to better characterize the soil adjacent to the storm drain running through IHSS 173
CN42-020	2085353 895	749876 431	2085307 307	749921 248	Surface Subsurface	0 0-0 5 0 5-2 5	0 0-0 5 0 5-2 5	Radionuclides Metals VOCs (subsurface only)	Statistical location relocated 8 ft east and 3 ft north to get as close to the roof drain as possible
CN42-021	2085411 616	749830 252	2085419 261	749833 283	Surface Subsurface	0 0-0 5 0 5-2 5	0 0-0 5 0 5-2 5	Radionuclides Metals VOCs (subsurface only)	Statistical location relocated 14 ft east and 2 ft south to get under tank containment
CN42-022	2085473 955	749831 614	2085487 905	749829 060	Surface Subsurface	0 0-0 5 0 5-2 5	0 0-0 5 0 5-2 5	Radionuclides Metals VOCs (subsurface only)	Statistical location relocated 15 ft west and 3 ft south to get as close to the roof drain as possible
CN42-023	2085336 294	749832 976	2085521 477	749830 442	Surface Subsurface	0 0-0 5 0 5-2 5	0 0-0 5 0 5-2 5	Radionuclides Metals VOCs (subsurface only)	Biased location to target storm drain line, no significant change
CN42-024	2085423 976	749795 099	2085423 957	749795 110	Subsurface	2 5-4 5	2 5-4 5	Radionuclides Metals VOCs	Statistical location, no significant change Second interval depth not achieved due to refusal
CN43-000	2085480 525	749978 221	2085480 000	749978 000	Subsurface	0 0-0 5 0 5-2 5	0 0-0 5 0 5-1 0	Radionuclides Metals VOCs	Statistical location, relocated 20 ft east and 21 ft south to near door where floor tile had already been removed First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal
CN43-002	2085355 817	749977 897	2085375 000	749956 000	Subsurface	0 0-0 5 0 5-2 5	0 5-1 0 1 0-1 5	Radionuclides Metals VOCs	

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Location Code	Proposed Easting	Proposed Northing	Actual Easting	Actual Northing	Soil Media	Proposed Depth Interval (ft)	Actual Depth Interval (ft)	Analyte	Comment
CN43-003	2085520 572	750098 214	2085520 000	750098 000	Subsurface	0 0-0 5 0 5-2 5	1 3-1 8 1 8-2 3	Radionuclides Metals VOCs	Biased location under tunnel, no significant change First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal
CN44-001	2085497 752	750200 360	2085520 000	750192 000	Subsurface	0 0-0 5 0 5-2 5	0 0-0 5 0 5-1 0	Radionuclides Metals VOCs	Biased location under tunnel vault, relocated 23 ft east and 8 ft south to where concrete slab was less thick (to near vault entrance) Second interval depth not achieved due to refusal
CO42-000	2085605 419	749906 547	2085600 000	749912 000	Subsurface	0 0-0 5 0 5-2 5	0 5-1 0 1 0-1 5	Radionuclides Metals VOCs	Statistical location, relocated 5 ft west and 5 ft north to avoid equipment First interval started deeper due to the presence of gravel or fill Second interval depth not achieved due to refusal
CO42-001	2085543 159	749870 384	2085543 000	749870 000	Subsurface	0 0-0 5 0 5-2 5	1 0-1 5	Radionuclides Metals VOCs	Statistical location, no significant change Only one interval could be sampled due to refusal First interval started deeper due to the presence of gravel or fill
CO42-006	2085542 972	749942 384	2085511 000	750025 000	Subsurface	0 0-0 5 0 5-2 5	0 5-1 0	Radionuclides Metals VOCs	Statistical location, actual coordinates are estimated Only one interval could be sampled due to refusal First interval started deeper due to the presence of gravel or fill
CO42-007	2085609 850	749955 018	2085595 664	749963 646	Subsurface	2 5-4 5	2 5-4 5	Radionuclides Metals VOCs	Biased location to target foundation drain line, relocated 14 ft west and 8 ft north to sample adjacent to drains as intended
CO42-008	2085728 742	749951 669	2085675 465	749960 973	Subsurface	2 5-4 5	2 5-4 5	Radionuclides Metals VOCs	Biased location to target foundation drain line, relocated 53 ft west and 9 ft north to sample adjacent to drains as intended
CO42-009	2085575 522	749869 617	2085575 522	749869 617	Sediment	0 0-0 0	0 0-0 5	Radionuclides Metals	Biased location to sample sediment in stairwell drain, no change
CO43-001	2085593 942	749998 556	2085588 429	750001 249	Subsurface	2 5-4 5	2 5-4 5	Radionuclides Metals VOCs	Biased location to target foundation drain lines, relocated 5 ft west and 3 ft north to sample adjacent to drains as intended
CQ42-002	2086086 608	749902 287	2086086 654	749902 283	Surface	0 0-0 5	0 0-0 5	Radionuclides Metals Explosives	Statistical location, no significant change
CQ42-003	2086062 411	749928 943	2086062 418	749928 912	Surface	0 0-0 5	0 0-0 5	Radionuclides Metals	Statistical location, no significant change

Closeout Report for IHSS Group 900-1

Location Code	Proposed Easting	Proposed Northing	Actual Easting	Actual Northing	Soil Media	Proposed Depth Interval (ft)	Actual Depth Interval (ft)	Analyte	Comment
CQ42-004	2086038 214	749955 598	2086038 251	749955 541	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals Explosives	Statistical location, no significant change
CQ42-005	2086121 790	749909 914	2086121 794	749909 912	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals	Statistical location, no significant change
CQ42-006	2086097 594	749936 570	2086097 576	749936 538	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals	Statistical location, no significant change
CQ42-007	2086132 776	749944 197	2086132 783	749944 187	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals Explosives	Statistical location, no significant change
CQ42-008	2086085 021	749956 466	2086085 021	749956 466	Subsurface	0 0 - 0 5 under pit slab	8 0 - 9 0 (depth directly beneath pit slab)	Radionuclides Metals Explosives	Biased location under the Building 993 explosive bonding pit slab, no significant change
CQ43-000	2086073 397	749963 225	2086073 388	749963 248	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals Explosives	Statistical location under the Building 993 slab, no significant change
CQ43-001	2086049 200	749989 881	2086049 160	749989 868	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals	Statistical location, no significant change
CQ43-002	2086108 580	749970 853	2086108 535	749970 860	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals	Statistical location, no significant change
CQ43-003	2086084 383	749997 508	2086084 358	749997 534	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals	Statistical location, no significant change Explosives analysis was planned but not conducted based on analytical results from other locations
CQ43-004	2086119 566	750005 135	2086119 525	750005 114	Surface	0 0 - 0 5	0 0 - 0 5	Radionuclides Metals	Statistical location, no significant change

VOC - volatile organic compound

**Table 2
Sampling and Analysis Summary**

Category	Planned Total	Actual Total
Number of Sampling Locations	50	50
Number of Samples	76	74
Number of Radionuclide Analyses	76	74
Number of Metal Analyses	76	74
Number of VOC Analyses	52	50
Number of Explosives Analyses	6	5

2.1 UBC 991, Weapons Assembly and R&D

Building 991, constructed between 1951 and 1952, was the first major building to be completed at RFETS. Building 991 was designed for shipping and receiving, and final assembly of weapon components. Plutonium, enriched uranium, and depleted uranium components fabricated on site, along with components manufactured from the Hanford Site and the Oak Ridge Reservation, were assembled into final products, inspected, tested, and placed back in storage prior to off-site shipment in Building 991. Radioactive and non-radioactive raw materials, special-order items, packaging items, components, and samples were stored in the Building 991 vaults. Administrative services for the Plant were also carried out in Building 991 until Building 111 was completed in 1953.

In 1957 final trigger assembly was moved to the newly constructed Building 777. Assembly of older uranium-based weapons continued in Building 991 until the 1960s. A limited number of plutonium-based triggers may have been assembled in Building 991 during the early 1960s. After 1957, the mission of Building 991 focused on shipping, receiving, and storage. Materials handled included special nuclear, non-radioactive raw, and classified materials, other metal components, partially finished products, purchase-order items, special-order items, samples, instruments, and documents. All radioactive materials received and stored in Building 991 were in U.S. Department of Transportation, U.S. Department of Energy (DOE), or intra-plant-approved shipping containers.

In addition to material shipping, receiving, and storage, a number of R&D projects were conducted in Building 991 from the 1960s to the mid-1970s. These projects included radiation studies, beryllium-coating processes, and an explosives-forming project. Most special projects and R&D operations were moved out of the building by 1976.

A metallographic laboratory in Building 991 was used to test the quality of non-nuclear raw material and non-nuclear, non-classified parts fabricated by off-site vendors. In the mid-1970s, Building 991 took over storage and inventory functions from Building 881 for these non-nuclear raw materials and non-nuclear, non-classified parts. In the late 1980s, handling of non-classified materials and parts was moved to Buildings 130 and 460. Materials and parts ready for assembly were moved directly to Building 460.

Until the mid-1980s, materials were shipped and received from the eastern dock areas. The western dock was added in the mid-1980s to provide a covered shipping area specifically designed for the safe, secure transports used to ship production materials. Until 1994, when a special loading dock was added to Building 371, Building 991 had the only shipping/receiving dock at the Plant capable of handling off-site shipments of special nuclear and classified materials.

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The final activity in Building 991 was waste storage. However, all waste was removed from the building during the fall of 2003.

2.2 IHSS 900-173, Radioactive Site Building 991

IHSS 900-173 originally encompassed Building 991 and associated underground storage vaults/tunnels 996, 997, 998, and 999. However, based on a proposal made in the HRR (DOE 1992 - 2003) and accepted by the regulatory agencies, the IHSS was reduced to include only the southern dock area of Building 991. The southern dock was a loading facility for the vaults/tunnels. The area received moderate to heavy traffic and has been paved for more than 20 years.

Products containing plutonium, uranium and beryllium were received and shipped from the dock. Also, cleaning solvents were received at the dock, and spent solvents (stored in drums) were shipped from the dock. Reportedly, small parts and equipment were cleaned in the dock area along the northern wall of the asphalt-covered courtyard. In the late 1950s and early 1960s, cleaning of depleted uranium parts was conducted in the courtyard of Building 991, which is located on the western side of the building near the dock. According to records, the dock and courtyard were often washed down with water that could have seeped into cracks and the edge of the asphalt. Spills and water could also have drained into the storm drains.

2.3 IHSS 900-184, Radioactive Site 991 Steam Cleaning Area

An area southwest of Building 991, near Building 992, may have been used between 1953 and 1978 to steam clean potentially radioactively contaminated equipment and drums. IHSS 900-184 was originally defined as a 50- by 50-foot area near Building 992, southwest of Building 991 (DOE 1994). More recent information indicates that the boundaries of this IHSS are approximately 55 by 77 feet, but no documentation exists that defines the location of washing activities.

2.4 PAC 900-1301, Building 991 Enclosed Area

An enclosed area believed to be approximately 50 feet wide along the southern side of Building 991 was used for storage of various radioactively contaminated waste and materials from approximately 1953 until January 1961. No documentation was found that mentioned any release to the environment from these drums.

Other materials were in storage in the same general area. These materials included shipping crates and carrying cases for assembled weapon components that may have been contaminated. No documentation was found that detailed a release to the environment due to stored materials.

2.5 PAC 900-1307, Explosive Bonding Pit

Explosive bonding experiments were conducted at the explosive forming area near Building 993. At least seven events took place within a few days in March 1968 in an experiment to explosively bond flat plates of stainless steel and uranium alloy. Other experiments of unknown nature took place in this general location for at least two and a half years. Until March 1968, experiments took place inside buried, sand-filled 55-gallon

drums. The explosive events took place below grade. Air shocks from the explosions were objectionable to Building 991 occupants until a pit was dug into a hillside to mitigate air shocks. The pit was approximately 10 feet in diameter and 7 feet deep.

2.6 Existing Characterization Data

Existing soil sampling locations and analytical results for IHSS Group 900-1 are presented on Figure 2. Only results greater than background means plus two standard deviations or method detection limits are shown. The soil data indicate that all contaminant concentrations are less than the RFCA wildlife refuge worker (WRW) action levels (ALs). These data were used to determine accelerated action sampling requirements.

2.7 Accelerated Action Characterization Data

Accelerated action soil and sediment sampling locations and analytical results for IHSS Group 900-1 are presented on Figures 3 and 4 and in Table 3. Only results greater than background means plus two standard deviations or reporting limits (RLs) are shown. In Table 3, AL exceedances are shown in bold, and total uranium concentrations and radionuclide activities estimated based on high-purity germanium (HPGe) results are presented in italic font. The data (normalized), retrieved from the RFETS Soil Water Database (SWD) on February 26, 2004, are provided on the enclosed compact disc.

Data indicate that all contaminant concentrations are less than RFCA WRW ALs, except for one surface and two subsurface arsenic concentrations. The elevated arsenic concentration in surface soil (at Sampling Location CN42-020) was 25.2 milligrams per kilogram (mg/kg), and the AL is 22.2 mg/kg. The elevated arsenic concentrations in subsurface soil were 25.1 and 40 mg/kg (at Sampling Locations CN42-020 and CN44-001, respectively). The elevated arsenic concentrations also exceeded the ecological receptor AL, which is 21.6 mg/kg.

In addition, twelve lead concentrations in surface soil, two lead concentrations in subsurface soil, three lead concentrations in sediment, and one beryllium concentration in sediment exceeded ecological receptor ALs. Lead concentrations ranged from 27.1 to 241 mg/kg, and the AL is 25.6 mg/kg. The beryllium concentration was 3.5 mg/kg, and the AL is 2.15 mg/kg. However, one of the lead concentrations that exceeded the ecological receptor AL and the beryllium concentration that exceeded the ecological receptor AL were below the respective background means plus two standard deviations.

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(Ref: 04-RF-00388, JLB-031-04)

Closeout Report for IHSS Group 900-1

(UBC 991, IHSS 900-173, IHSS 900-184, PAC 900-13-1 and PAC 900-1307)

April 2004

Figure 3:

Accelerated Action Sampling Locations and Results at IHSS Group 900-1 Surface Soil and Sediments

File: W:\Projects\Fy2003\900-1\Closeout\900-1_close.apr

February 26, 2004

CERCLA Administrative Record Document, IA-A-002056

U S DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

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(Ref 04-RF-00388; JLB-031-04)

Closeout Report for IHSS Group 900-1

(UBC 991, IHSS 900-173, IHSS 900-184, PAC 900-13-1 and PAC 900-1307)

April 2004

Figure 4:

Accelerated Action Sampling Locations and Results at IHSS Group 900-1 Subsurface Soil

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February 26, 2004

CERCLA Administrative Record Document, IA-A-002056

U S DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

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Table 3
IHSS Group 900-1 Accelerated Action Characterization Data

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRWAL	Ecological AL	Background
CL43-000	750085 56	2084720 63	0 5	1 5	Barium	691 00	mg/kg	98 00	26400 0	--	289 38
CL43-000	750085 56	2084720 63	0 5	1 5	Copper	116 00	mg/kg	4 00	40900 0	--	38 21
CL43-000	750085 56	2084720 63	0 5	1 5	Uranium Total	15 54	mg/kg	6 23	2750 0	67 8	3 04
CL43-000	750085 56	2084720 63	0 5	1 5	Vanadium	208 00	mg/kg	31 00	7150 0	433 0	88 49
CL43-000	750085 56	2084720 63	0 5	1 5	Uranium Total	5 67	mg/kg	0 20	2750 0	67 8	3 04
CL43-000	750085 56	2084720 63	0 5	1 5	Uranium-238	5 23	pCi/g	2 10	351 0	1600 0	1 49
CL43-000	750085 56	2084720 63	0 5	1 5	Uranium-235	0 30	pCi/g	0 19	8 0	1900 0	0 12
CL43-000	750085 56	2084720 63	0 5	1 5	Uranium-234	5 23	pCi/g	2 10	300 0	1800 0	2 64
CL43-004	750086 90	2084967 68	1 4	1 9	Barium	479 00	mg/kg	98 00	26400 0	--	289 38
CL43-004	750086 90	2084967 68	1 4	1 9	Copper	74 00	mg/kg	4 00	40900 0	--	38 21
CL43-004	750086 90	2084967 68	1 4	1 9	Ethylbenzene	1100 00	ug/kg	590 00	4250000 0	--	--
CL43-004	750086 90	2084967 68	1 4	1 9	Naphthalene	350000 00	ug/kg	12000 00	3090000 0	--	--
CL43-004	750086 90	2084967 68	1 4	1 9	Toluene	1000 00	ug/kg	590 00	31300000 0	128000 0	--
CL43-004	750086 90	2084967 68	1 4	1 9	Uranium, Total	13 44	mg/kg	5 52	2750 0	67 8	3 04
CL43-004	750086 90	2084967 68	1 4	1 9	Vanadium	198 00	mg/kg	31 00	7150 0	433 0	88 49
CL43-004	750086 90	2084967 68	1 4	1 9	Xylene	4500 00	ug/kg	1200 00	2040000 0	--	--
CL43-004	750086 90	2084967 68	1 4	1 9	Uranium-238	4 53	pCi/g	1 86	351 0	1600 0	1 49
CL43-004	750086 90	2084967 68	1 4	1 9	Uranium-235	0 26	pCi/g	0 16	8 0	1900 0	0 12
CL43-004	750086 90	2084967 68	1 4	1 9	Uranium-234	4 53	pCi/g	1 86	300 0	1800 0	2 64
CL43-004	750086 90	2084967 68	1 9	3 9	Barium	302 00	mg/kg	98 00	26400 0	--	289 38
CL43-004	750086 90	2084967 68	1 9	3 9	Chromium	81 40	mg/kg	20 00	268 0	--	68 27
CL43-004	750086 90	2084967 68	1 9	3 9	Copper	146 00	mg/kg	4 00	40900 0	--	38 21
CL43-004	750086 90	2084967 68	1 9	3 9	Lead	30 20	mg/kg	7 00	1000 0	25 6	24 97
CL43-004	750086 90	2084967 68	1 9	3 9	Naphthalene	3600 00	ug/kg	610 00	3090000 0	--	--
CL43-004	750086 90	2084967 68	1 9	3 9	Uranium Total	9 03	mg/kg	5 97	2750 0	67 8	3 04
CL43-004	750086 90	2084967 68	1 9	3 9	Vanadium	268 00	mg/kg	31 00	7150 0	433 0	88 49
CL43-004	750086 90	2084967 68	1 9	3 9	Uranium-238	3 04	pCi/g	2 01	351 0	1600 0	1 49
CL43-004	750086 90	2084967 68	1 9	3 9	Uranium-235	0 17	pCi/g	0 17	8 0	1900 0	0 12

Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CM43-004	750086 90	2084967 68	1 9	3 9	Uranium-234	3 04	pCi/g	2 01	300 0	1800 0	2 64
CM42-001	749869 73	2085293 75	0 4	0 9	Tetrachloroethene	1050 00	ug/kg	237 00	615000 0	37500 0	--
CM42-001	749869 73	2085293 75	0 4	0 9	Trichloroethene	471 00	ug/kg	25 00	19600 0	509000 0	--
CM42-001	749869 73	2085293 75	0 4	0 9	Uranium Total	5 22	mg/kg	3 59	2750 0	67 8	3 04
CM42-001	749869 73	2085293 75	0 4	0 9	Uranium-238	1 76	pCi/g	1 21	351 0	1600 0	1 49
CM42-001	749869 73	2085293 75	0 4	0 9	Uranium-235	0 15	pCi/g	0 13	8 0	1900 0	0 12
CM42-001	749869 73	2085293 75	0 9	1 7	Tetrachloroethene	96 10	ug/kg	5 65	615000 0	37500 0	--
CM42-001	749869 73	2085293 75	0 9	1 7	Trichloroethene	22 50	ug/kg	5 65	19600 0	509000 0	--
CM42-001	749869 73	2085293 75	0 9	1 7	Uranium Total	4 79	mg/kg	3 98	2750 0	67 8	3 04
CM42-001	749869 73	2085293 75	0 9	1 7	Uranium-238	1 61	pCi/g	1 34	351 0	1600 0	1 49
CM42-004	749941 84	2085293 52	0 5	1 0	Uranium Total	5 17	mg/kg	3 07	2750 0	67 8	3 04
CM42-004	749941 84	2085293 52	0 5	1 0	Uranium-238	1 74	pCi/g	1 03	351 0	1600 0	1 49
CM42-004	749941 84	2085293 52	0 5	1 0	Uranium-235	0 22	pCi/g	0 12	8 0	1900 0	0 12
CM42-004	749941 84	2085293 52	1 0	2 0	Tetrachloroethene	22 20	ug/kg	6 28	615000 0	37500 0	--
CM42-004	749941 84	2085293 52	1 0	2 0	Trichloroethene	27 80	ug/kg	6 28	19600 0	509000 0	--
CM42-004	749941 84	2085293 52	1 0	2 0	Uranium Total	8 27	mg/kg	4 31	2750 0	67 8	3 04
CM42-004	749941 84	2085293 52	1 0	2 0	Uranium-238	2 79	pCi/g	1 45	351 0	1600 0	1 49
CM42-004	749941 84	2085293 52	1 0	2 0	Uranium-234	2 79	pCi/g	1 45	300 0	1800 0	2 64
CM42-005	749898 68	2085309 28	0 0	0 5	Arsenic	13 20	mg/kg	2 00	22 2	21 6	10 09
CM42-005	749898 68	2085309 28	0 0	0 5	Barium	731 00	mg/kg	224 00	26400 0	--	141 26
CM42-005	749898 68	2085309 28	0 0	0 5	Copper	39 80	mg/kg	3 00	40900 0	--	18 06
CM42-005	749898 68	2085309 28	0 0	0 5	Iron	32300 00	mg/kg	952 00	307000 0	--	18037 00
CM42-005	749898 68	2085309 28	0 0	0 5	Manganese	484 00	mg/kg	48 00	3480 0	--	365 08
CM42-005	749898 68	2085309 28	0 0	0 5	Nickel	40 30	mg/kg	4 00	20400 0	--	14 91
CM42-005	749898 68	2085309 28	0 0	0 5	Strontium	295 00	mg/kg	18 00	613000 0	--	48 94
CM42-005	749898 68	2085309 28	0 0	0 5	Tin	3 12	mg/kg	3 00	613000 0	--	2 90
CM42-005	749898 68	2085309 28	0 0	0 5	Uranium Total	14 62	mg/kg	5 49	2750 0	67 8	5 98
CM42-005	749898 68	2085309 28	0 0	0 5	Vanadium	93 60	mg/kg	18 00	7150 0	433 0	45 59
CM42-005	749898 68	2085309 28	0 0	0 5	Zinc	85 50	mg/kg	8 00	307000 0	--	73 76
CM42-005	749898 68	2085309 28	0 0	0 5	Uranium-238	4 92	pCi/g	1 85	351 0	1600 0	2 00

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Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CM42-005	749898 68	2085309 28	0 0	0 5	Uranium-235	0 20	pCi/g	0 13	8 0	1900 0	0 09
CM42-005	749898 68	2085309 28	0 0	0 5	Uranium-234	4 92	pCi/g	1 85	300 0	1800 0	2 25
CM42-005	749898 68	2085309 28	0 5	2 5	Barium	358 00	mg/kg	224 00	26400 0	--	289 38
CM42-005	749898 68	2085309 28	0 5	2 5	Copper	88 00	mg/kg	3 00	40900 0	--	38 21
CM42-005	749898 68	2085309 28	0 5	2 5	Uranium, Total	12 03	mg/kg	5 59	2750 0	67 8	3 04
CM42-005	749898 68	2085309 28	0 5	2 5	Vanadium	188 00	mg/kg	18 00	7150 0	433 0	88 49
CM42-005	749898 68	2085309 28	0 5	2 5	Zinc	194 00	mg/kg	8 00	307000 0	--	139 10
CM42-005	749898 68	2085309 28	0 5	2 5	Uranium-238	4 05	pCi/g	1 88	351 0	1600 0	1 49
CM42-005	749898 68	2085309 28	0 5	2 5	Uranium-235	0 24	pCi/g	0 15	8 0	1900 0	0 12
CM42-005	749898 68	2085309 28	0 5	2 5	Uranium-234	4 05	pCi/g	1 88	300 0	1800 0	2 64
CM42-006	749799 35	2085332 39	2 5	4 5	Methylene chloride	1 00	ug/kg	1 00	2530000 0	39500 0	--
CM42-006	749799 35	2085332 39	2 5	4 5	Uranium Total	3 15	mg/kg	0 35	2750 0	67 8	3 04
CM42-007	749835 21	2085329 51	0 0	0 5	Arsenic	16 00	mg/kg	2 00	22 2	21 6	10 09
CM42-007	749835 21	2085329 51	0 0	0 5	Barium	507 00	mg/kg	224 00	26400 0	--	141 26
CM42-007	749835 21	2085329 51	0 0	0 5	Chromium	47 30	mg/kg	12 00	268 0	--	16 99
CM42-007	749835 21	2085329 51	0 0	0 5	Copper	47 50	mg/kg	3 00	40900 0	--	18 06
CM42-007	749835 21	2085329 51	0 0	0 5	Iron	19900 00	mg/kg	952 00	307000 0	--	18037 00
CM42-007	749835 21	2085329 51	0 0	0 5	Lead	27 30	mg/kg	6 00	1000 0	25 6	54 62
CM42-007	749835 21	2085329 51	0 0	0 5	Nickel	27 40	mg/kg	4 00	20400 0	--	14 91
CM42-007	749835 21	2085329 51	0 0	0 5	Strontium	308 00	mg/kg	18 00	613000 0	--	48 94
CM42-007	749835 21	2085329 51	0 0	0 5	Uranium, Total	15 00	mg/kg	4 40	2750 0	67 8	5 98
CM42-007	749835 21	2085329 51	0 0	0 5	Vanadium	162 00	mg/kg	18 00	7150 0	433 0	45 59
CM42-007	749835 21	2085329 51	0 0	0 5	Zinc	90 90	mg/kg	8 00	307000 0	--	73 76
CM42-007	749835 21	2085329 51	0 0	0 5	Uranium-238	5 05	pCi/g	1 48	351 0	1600 0	2 00
CM42-007	749835 21	2085329 51	0 0	0 5	Uranium-235	0 25	pCi/g	0 16	8 0	1900 0	0 09
CM42-007	749835 21	2085329 51	0 0	0 5	Uranium-234	5 05	pCi/g	1 48	300 0	1800 0	2 25
CM42-007	749835 21	2085329 51	0 5	2 5	Arsenic	13 20	mg/kg	2 00	22 2	21 6	13 14
CM42-007	749835 21	2085329 51	0 5	2 5	Barium	539 00	mg/kg	224 00	26400 0	--	289 38
CM42-007	749835 21	2085329 51	0 5	2 5	Copper	39 00	mg/kg	3 00	40900 0	--	38 21
CM42-007	749835 21	2085329 51	0 5	2 5	Strontium	270 00	mg/kg	18 00	613000 0	--	211 38

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CM42-007	749835 21	2085329 51	0.5	2.5	Uranium, Total	13 31	mg/kg	4 88	2750 0	67 8	3 04
CM42-007	749835 21	2085329 51	0.5	2.5	Vanadium	166 00	mg/kg	18 00	7150 0	433 0	88 49
CM42-007	749835 21	2085329 51	0.5	2.5	Uranium-238	4 48	pCi/g	1 64	351 0	1600 0	1 49
CM42-007	749835 21	2085329 51	0.5	2.5	Uranium-235	0 17	pCi/g	0 11	8 0	1900 0	0 12
CM42-007	749835 21	2085329 51	0.5	2.5	Uranium-234	4 48	pCi/g	1 64	300 0	1800 0	2 64
CM42-008	749814 81	2085299 85	0.0	0.5	Arsenic	12 90	mg/kg	2 00	22 2	21 6	10 09
CM42-008	749814 81	2085299 85	0.0	0.5	Barium	775 00	mg/kg	224 00	26400 0	--	141 26
CM42-008	749814 81	2085299 85	0.0	0.5	Cadmium	4 82	mg/kg	2 00	962 0	--	1 61
CM42-008	749814 81	2085299 85	0.0	0.5	Copper	52 30	mg/kg	3 00	40900 0	--	18 06
CM42-008	749814 81	2085299 85	0.0	0.5	Iron	36000 00	mg/kg	952 00	307000 0	--	18037 00
CM42-008	749814 81	2085299 85	0.0	0.5	Manganese	551 00	mg/kg	48 00	3480 0	--	365 08
CM42-008	749814 81	2085299 85	0.0	0.5	Nickel	45 10	mg/kg	4 00	20400 0	--	14 91
CM42-008	749814 81	2085299 85	0.0	0.5	Strontium	254 00	mg/kg	18 00	613000 0	--	48 94
CM42-008	749814 81	2085299 85	0.0	0.5	Uranium Total	10 71	mg/kg	4 64	2750 0	67 8	5 98
CM42-008	749814 81	2085299 85	0.0	0.5	Vanadium	111 00	mg/kg	18 00	7150 0	433 0	45 59
CM42-008	749814 81	2085299 85	0.0	0.5	Zinc	111 00	mg/kg	8 00	307000 0	--	73 76
CM42-008	749814 81	2085299 85	0.0	0.5	Uranium-238	3 61	pCi/g	1 56	351 0	1600 0	2 00
CM42-008	749814 81	2085299 85	0.0	0.5	Uranium-235	0 17	pCi/g	0 13	8 0	1900 0	0 09
CM42-008	749814 81	2085299 85	0.0	0.5	Uranium-234	3 61	pCi/g	1 56	300 0	1800 0	2 25
CM42-008	749814 81	2085299 85	0.5	2.5	Barium	342 00	mg/kg	224 00	26400 0	--	289 38
CM42-008	749814 81	2085299 85	0.5	2.5	Copper	77 60	mg/kg	3 00	40900 0	--	38 21
CM42-008	749814 81	2085299 85	0.5	2.5	Uranium, Total	11 18	mg/kg	5 03	2750 0	67 8	3 04
CM42-008	749814 81	2085299 85	0.5	2.5	Vanadium	201 00	mg/kg	18 00	7150 0	433 0	88 49
CM42-008	749814 81	2085299 85	0.5	2.5	Uranium-238	3 76	pCi/g	1 69	351 0	1600 0	1 49
CM42-008	749814 81	2085299 85	0.5	2.5	Uranium-235	0 16	pCi/g	0 13	8 0	1900 0	0 12
CM42-008	749814 81	2085299 85	0.5	2.5	Uranium-234	3 76	pCi/g	1 69	300 0	1800 0	2 64
CM42-009	749850 71	2085297 02	0.0	0.5	Arsenic	13 60	mg/kg	2 00	22 2	21 6	10 09
CM42-009	749850 71	2085297 02	0.0	0.5	Barium	837 00	mg/kg	224 00	26400 0	--	141 26
CM42-009	749850 71	2085297 02	0.0	0.5	Copper	44 00	mg/kg	3 00	40900 0	--	18 06
CM42-009	749850 71	2085297 02	0.0	0.5	Iron	32400 00	mg/kg	952 00	307000 0	--	18037 00

Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CM42-009	749850 71	2085297 02	0 0	0 5	Manganese	442 00	mg/kg	48 00	3480 0	--	365 08
CM42-009	749850 71	2085297 02	0 0	0 5	Nickel	37 40	mg/kg	4 00	20400 0	--	14 91
CM42-009	749850 71	2085297 02	0 0	0 5	Strontium	298 00	mg/kg	18 00	613000 0	--	48 94
CM42-009	749850 71	2085297 02	0 0	0 5	Uranium Total	10 07	mg/kg	4 88	2750 0	67 8	5 98
CM42-009	749850 71	2085297 02	0 0	0 5	Vanadium	76 40	mg/kg	18 00	7150 0	433 0	45 59
CM42-009	749850 71	2085297 02	0 0	0 5	Zinc	79 40	mg/kg	8 00	307000 0	--	73 76
CM42-009	749850 71	2085297 02	0 0	0 5	Uranium-238	3 39	pCi/g	1 64	351 0	1600 0	2 00
CM42-009	749850 71	2085297 02	0 0	0 5	Uranium-235	0 15	pCi/g	0 12	8 0	1900 0	0 09
CM42-009	749850 71	2085297 02	0 0	0 5	Uranium-234	3 39	pCi/g	1 64	300 0	1800 0	2 25
CM42-009	749850 71	2085297 02	0 5	2 5	Arsenic	13 40	mg/kg	2 00	22 2	21 6	13 14
CM42-009	749850 71	2085297 02	0 5	2 5	Barium	660 00	mg/kg	224 00	26400 0	--	289 38
CM42-009	749850 71	2085297 02	0 5	2 5	Copper	46 80	mg/kg	3 00	40900 0	--	38 21
CM42-009	749850 71	2085297 02	0 5	2 5	Uranium Total	12 80	mg/kg	5 73	2750 0	67 8	3 04
CM42-009	749850 71	2085297 02	0 5	2 5	Vanadium	160 00	mg/kg	18 00	7150 0	433 0	88 49
CM42-009	749850 71	2085297 02	0 5	2 5	Uranium-238	4 31	pCi/g	1 93	351 0	1600 0	1 49
CM42-009	749850 71	2085297 02	0 5	2 5	Uranium-235	0 23	pCi/g	0 15	8 0	1900 0	0 12
CM42-009	749850 71	2085297 02	0 5	2 5	Uranium-234	4 31	pCi/g	1 93	300 0	1800 0	2 64
CM42-010	749765 83	2085313 47	2 5	4 5	Methylene chloride	0 98	ug/kg	0 89	2530000 0	39500 0	--
CM42-010	749765 83	2085313 47	2 5	4 5	Uranium-235	0 40	pCi/g	0 33	8 0	1900 0	0 12
CM42-011	749789 25	2085320 10	2 5	4 5	Barium	749 00	mg/kg	98 00	26400 0	--	289 38
CM42-011	749789 25	2085320 10	2 5	4 5	Copper	53 10	mg/kg	4 00	40900 0	--	38 21
CM42-011	749789 25	2085320 10	2 5	4 5	Ethylbenzene	12 00	ug/kg	6 30	4250000 0	--	--
CM42-011	749789 25	2085320 10	2 5	4 5	Strontium	265 00	mg/kg	20 00	613000 0	--	211 38
CM42-011	749789 25	2085320 10	2 5	4 5	Uranium Total	11 05	mg/kg	6 55	2750 0	67 8	3 04
CM42-011	749789 25	2085320 10	2 5	4 5	Vanadium	221 00	mg/kg	31 00	7150 0	433 0	88 49
CM42-011	749789 25	2085320 10	2 5	4 5	Xylene	44 00	ug/kg	13 00	2040000 0	--	--
CM42-011	749789 25	2085320 10	2 5	4 5	Zinc	258 00	mg/kg	9 00	307000 0	--	139 10
CM42-011	749789 25	2085320 10	2 5	4 5	Uranium-238	3 72	pCi/g	2 21	351 0	1600 0	1 49
CM42-011	749789 25	2085320 10	2 5	4 5	Uranium-234	3 72	pCi/g	2 21	300 0	1800 0	2 64
CM42-012	749816 87	2085330 24	0 0	0 5	Arsenic	14 00	mg/kg	2 00	22 2	21 6	7 24
CM42-012	749816 87	2085330 24	0 0	0 5	Barium	697 00	mg/kg	224 00	26400 0	-	188 17

Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CM42-012	749816 87	2085330 24	0 0	0 5	Cadmium	14 20	mg/kg	2 00	962 0	-	1 88
CM42-012	749816 87	2085330 24	0 0	0 5	Chromium	61 20	mg/kg	12 00	268 0	-	23 23
CM42-012	749816 87	2085330 24	0 0	0 5	Copper	92 50	mg/kg	3 00	40900 0	-	27 27
CM42-012	749816 87	2085330 24	0 0	0 5	Iron	48100 00	mg/kg	952 00	307000 0	-	21379 01
CM42-012*	749816 87	2085330 24	0 0	0 5	Lead	168 00	mg/kg	6 00	1000 0	25 6	95 60
CM42-012	749816 87	2085330 24	0 0	0 5	Manganese	768 00	mg/kg	48 00	3480 0	-	659 22
CM42-012	749816 87	2085330 24	0 0	0 5	Nickel	42 20	mg/kg	4 00	20400 0	-	17 89
CM42-012	749816 87	2085330 24	0 0	0 5	Silver	2 37	mg/kg	2 00	5110 0	-	2 28
CM42-012	749816 87	2085330 24	0 0	0 5	Strontium	228 00	mg/kg	18 00	613000 0	-	201 44
CM42-012	749816 87	2085330 24	0 0	0 5	Uranium, Total	15 50	mg/kg	4 50	2750 0	67 8	-
CM42-012	749816 87	2085330 24	0 0	0 5	Vanadium	115 00	mg/kg	18 00	7150 0	433 0	46 83
CM42-012	749816 87	2085330 24	0 0	0 5	Zinc	2670 00	mg/kg	8 00	307000 0	-	104 40
CM42-012	749816 87	2085330 24	0 0	0 5	Uranium-238	5 22	pCi/g	1 52	351 0	1600 0	3 46
CM42-012	749816 87	2085330 24	0 0	0 5	Uranium-235	0 19	pCi/g	0 12	8 0	1900 0	0 15
CM42-012	749816 87	2085330 24	0 0	0 5	Uranium-234	5 22	pCi/g	1 52	300 0	1800 0	3 98
CM42-013	749780 00	2085281 68	2 5	4 5	Barium	483 00	mg/kg	98 00	26400 0	--	289 38
CM42-013	749780 00	2085281 68	2 5	4 5	Copper	119 00	mg/kg	4 00	40900 0	--	38 21
CM42-013	749780 00	2085281 68	2 5	4 5	Uranium, Total	12 31	mg/kg	5 85	2750 0	67 8	3 04
CM42-013	749780 00	2085281 68	2 5	4 5	Vanadium	180 00	mg/kg	31 00	7150 0	433 0	88 49
CM42-013	749780 00	2085281 68	2 5	4 5	Uranium-238	4 15	pCi/g	1 97	351 0	1600 0	1 49
CM42-013	749780 00	2085281 68	2 5	4 5	Uranium-235	0 21	pCi/g	0 14	8 0	1900 0	0 12
CM42-013	749780 00	2085281 68	2 5	4 5	Uranium-234	4 15	pCi/g	1 97	300 0	1800 0	2 64
CM42-014	749937 40	2085276 48	2 5	4 5	1,2,4-Trichlorobenzene	0 81	ug/kg	0 80	9230000 0	--	--
CM42-014	749937 40	2085276 48	2 5	4 5	Methylene chloride	1 00	ug/kg	0 90	2530000 0	39500 0	--
CM42-014	749937 40	2085276 48	2 5	4 5	Naphthalene	2 80	ug/kg	0 97	3090000 0	--	--
CM43-000	749960 74	2085305 17	2 5	4 5	Barium	347 00	mg/kg	224 00	26400 0	--	289 38
CM43-000	749960 74	2085305 17	2 5	4 5	Copper	71 10	mg/kg	3 00	40900 0	--	38 21
CM43-000	749960 74	2085305 17	2 5	4 5	Uranium, Total	9 58	mg/kg	4 35	2750 0	67 8	3 04
CM43-000	749960 74	2085305 17	2 5	4 5	Vanadium	249 00	mg/kg	18 00	7150 0	433 0	88 49
CM43-000	749960 74	2085305 17	2 5	4 5	Uranium-238	3 23	pCi/g	1 46	351 0	1600 0	1 49
CM43-000	749960 74	2085305 17	2 5	4 5	Uranium-235	0 16	pCi/g	0 11	8 0	1900 0	0 12

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW-AL	Ecological AL	Background
CM43-000	749960 74	2085305 17	2 5	4 5	Uranium-234	3 23	pCi/g	1 46	300 0	1800 0	2 64
CM43-001	750084 23	2085277 49	0 6	1 1	Arsenic	13 20	mg/kg	5 00	22 2	21 6	13 14
CM43-001	750084 23	2085277 49	0 6	1 1	Barium	566 00	mg/kg	98 00	26400 0	--	289 38
CM43-001	750084 23	2085277 49	0 6	1 1	Copper	120 00	mg/kg	4 00	40900 0	--	38 21
CM43-001	750084 23	2085277 49	0 6	1 1	Uranium, Total	13 64	mg/kg	5 44	2750 0	67 8	3 04
CM43-001	750084 23	2085277 49	0 6	1 1	Vanadium	162 00	mg/kg	31 00	7150 0	433 0	88 49
CM43-001	750084 23	2085277 49	0 6	1 1	Uranium-238	4 59	pCi/g	1 83	351 0	1600 0	1 49
CM43-001	750084 23	2085277 49	0 6	1 1	Uranium-235	0 24	pCi/g	0 16	8 0	1900 0	0 12
CM43-001	750084 23	2085277 49	0 6	1 1	Uranium-234	4 59	pCi/g	1 83	300 0	1800 0	2 64
CM43-001	750084 23	2085277 49	1 1	2 6	Barium	547 00	mg/kg	98 00	26400 0	--	289 38
CM43-001	750084 23	2085277 49	1 1	2 6	Copper	118 00	mg/kg	4 00	40900 0	--	38 21
CM43-001	750084 23	2085277 49	1 1	2 6	Uranium, Total	10 11	mg/kg	5 33	2750 0	67 8	3 04
CM43-001	750084 23	2085277 49	1 1	2 6	Vanadium	175 00	mg/kg	31 00	7150 0	433 0	88 49
CM43-001	750084 23	2085277 49	1 1	2 6	Uranium-238	3 40	pCi/g	1 79	351 0	1600 0	1 49
CM43-001	750084 23	2085277 49	1 1	2 6	Uranium-235	0 24	pCi/g	0 15	8 0	1900 0	0 12
CM43-001	750084 23	2085277 49	1 1	2 6	Uranium-234	3 40	pCi/g	1 79	300 0	1800 0	2 64
CM43-002	749962 70	2085306 87	0 8	1 3	Arsenic	16 20	mg/kg	5 00	22 2	21 6	13 14
CM43-002	749962 70	2085306 87	0 8	1 3	Barium	575 00	mg/kg	98 00	26400 0	--	289 38
CM43-002	749962 70	2085306 87	0 8	1 3	Copper	117 00	mg/kg	4 00	40900 0	--	38 21
CM43-002	749962 70	2085306 87	0 8	1 3	Uranium, Total	13 11	mg/kg	5 83	2750 0	67 8	3 04
CM43-002	749962 70	2085306 87	0 8	1 3	Vanadium	169 00	mg/kg	31 00	7150 0	433 0	88 49
CM43-002	749962 70	2085306 87	0 8	1 3	Uranium-238	4 41	pCi/g	1 96	351 0	1600 0	1 49
CM43-002	749962 70	2085306 87	0 8	1 3	Uranium-234	4 41	pCi/g	1 96	300 0	1800 0	2 64
CM43-002	749962 70	2085306 87	1 3	2 3	Barium	435 00	mg/kg	98 00	26400 0	--	289 38
CM43-002	749962 70	2085306 87	1 3	2 3	Copper	81 90	mg/kg	4 00	40900 0	--	38 21
CM43-002	749962 70	2085306 87	1 3	2 3	Uranium, Total	10 76	mg/kg	5 33	2750 0	67 8	3 04
CM43-002	749962 70	2085306 87	1 3	2 3	Vanadium	230 00	mg/kg	31 00	7150 0	433 0	88 49
CM43-002	749962 70	2085306 87	1 3	2 3	Uranium-238	3 62	pCi/g	1 79	351 0	1600 0	1 49
CM43-002	749962 70	2085306 87	1 3	2 3	Uranium-235	0 22	pCi/g	0 15	8 0	1900 0	0 12
CM43-002	749962 70	2085306 87	1 3	2 3	Uranium-234	3 62	pCi/g	1 79	300 0	1800 0	2 64
CN41-000	749743 19	2085489 28	0 0	0 5	Arsenic	10 70	mg/kg	2 00	22 2	21 6	7 24

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CN41-000	749743 19	2085489 28	0 0	0 5	Barium	805 00	mg/kg	224 00	26400 0	-	188 17
CN41-000	749743 19	2085489 28	0 0	0 5	Chromium	26 00	mg/kg	12 00	268 0	-	23 23
CN41-000	749743 19	2085489 28	0 0	0 5	Copper	51 20	mg/kg	3 00	40900 0	-	27 27
CN41-000	749743 19	2085489 28	0 0	0 5	Iron	36900 00	mg/kg	952 00	307000 0	-	21379 01
CN41-000*	749743 19	2085489 28	0 0	0 5	Lead	35 00	mg/kg	6 00	1000 0	25 6	95 60
CN41-000	749743 19	2085489 28	0 0	0 5	Nickel	38 90	mg/kg	4 00	20400 0	-	17 89
CN41-000	749743 19	2085489 28	0 0	0 5	Uranium, Total	10 89	mg/kg	4 95	2750 0	67 8	-
CN41-000	749743 19	2085489 28	0 0	0 5	Vanadium	142 00	mg/kg	18 00	7150 0	433 0	46 83
CN41-000	749743 19	2085489 28	0 0	0 5	Zinc	503 00	mg/kg	8 00	307000 0	-	104 40
CN41-000	749743 19	2085489 28	0 0	0 5	Uranium-238	3 67	pCi/g	1 67	351 0	1600 0	3 46
CN41-000	749743 19	2085489 28	0 0	0 5	Uranium-235	0 21	pCi/g	0 11	8 0	1900 0	0 15
CN41-000	749743 19	2085489 28	0 0	0 5	Uranium-234	3 67	pCi/g	1 67	300 0	1800 0	3 98
CN42-005	749918 00	2085470 00	0 5	1 0	Uranium, Total	10 37	mg/kg	4 84	2750 0	67 8	3 04
CN42-005	749918 00	2085470 00	0 5	1 0	Uranium-238	3 49	pCi/g	1 63	351 0	1600 0	1 49
CN42-005	749918 00	2085470 00	0 5	1 0	Uranium-235	0 23	pCi/g	0 12	8 0	1900 0	0 12
CN42-005	749918 00	2085470 00	0 5	1 0	Uranium-234	3 49	pCi/g	1 63	300 0	1800 0	2 64
CN42-005	749918 00	2085470 00	1 0	1 5	Barium	350 00	mg/kg	0 43	26400 0	--	289 38
CN42-005	749918 00	2085470 00	1 0	1 5	Strontium	240 00	mg/kg	0 07	613000 0	--	211 38
CN42-005	749918 00	2085470 00	1 0	1 5	Uranium, Total	12 60	mg/kg	5 91	2750 0	67 8	3 04
CN42-005	749918 00	2085470 00	1 0	1 5	Uranium-238	4 24	pCi/g	1 99	351 0	1600 0	1 49
CN42-005	749918 00	2085470 00	1 0	1 5	Uranium-235	0 30	pCi/g	0 29	8 0	1900 0	0 12
CN42-005	749918 00	2085470 00	1 0	1 5	Uranium-234	4 24	pCi/g	1 99	300 0	1800 0	2 64
CN42-007	749870 00	2085418 00	1 2	1 7	Copper	41 00	mg/kg	0 05	40900 0	--	38 21
CN42-007	749870 00	2085418 00	1 2	1 7	Uranium-235	0 18	pCi/g	0 16	8 0	1900 0	0 12
CN42-015	749950 00	2085425 00	0 5	1 0	Copper	79 00	mg/kg	0 04	40900 0	--	38 21
CN42-015	749950 00	2085425 00	0 5	1 0	Strontium	250 00	mg/kg	0 06	613000 0	--	211 38
CN42-015	749950 00	2085425 00	0 5	1 0	Uranium, Total	15 30	mg/kg	5 16	2750 0	67 8	3 04
CN42-015	749950 00	2085425 00	0 5	1 0	Uranium-238	5 15	pCi/g	1 74	351 0	1600 0	1 49
CN42-015	749950 00	2085425 00	0 5	1 0	Uranium-235	0 23	pCi/g	0 17	8 0	1900 0	0 12
CN42-015	749950 00	2085425 00	0 5	1 0	Uranium-234	5 15	pCi/g	1 74	300 0	1800 0	2 64
CN42-015	749950 00	2085425 00	1 0	1 5	Copper	93 00	mg/kg	0 04	40900 0	--	38 21

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CN42-015	749950 00	2085425 00	1 0	1 5	Strontium	230 00	mg/kg	0 06	613000 0	--	211 38
CN42-015	749950 00	2085425 00	1 0	1 5	Uranium, Total	13 28	mg/kg	5 06	2750 0	67 8	3 04
CN42-015	749950 00	2085425 00	1 0	1 5	Uranium-238	4 47	pCi/g	1 70	351 0	1600 0	1 49
CN42-015	749950 00	2085425 00	1 0	1 5	Uranium-235	0 29	pCi/g	0 17	8 0	1900 0	0 12
CN42-015	749950 00	2085425 00	1 0	1 5	Uranium-234	4 47	pCi/g	1 70	300 0	1800 0	2 64
CN42-017	749884 24	2085329 46	0 5	1 0	Tetrachloroethene	7 15	ug/kg	5 97	615000 0	37500 0	--
CN42-017	749884 24	2085329 46	0 5	1 0	Trichloroethene	10 00	ug/kg	5 97	19600 0	509000 0	--
CN42-017	749884 24	2085329 46	1 0	2 0	Uranium, Total	12 10	mg/kg	4 37	2750 0	67 8	3 04
CN42-017	749884 24	2085329 46	1 0	2 0	Uranium-238	4 07	pCi/g	1 47	351 0	1600 0	1 49
CN42-017	749884 24	2085329 46	1 0	2 0	Uranium-234	4 07	pCi/g	1 47	300 0	1800 0	2 64
CN42-020	749921 25	2085307 31	0 0	0 5	Antimony	12 40	mg/kg	8 00	409 0	--	0 47
CN42-020	749921 25	2085307 31	0 0	0 5	Arsenic	25 20	mg/kg	2 00	22 2	21 6	10 09
CN42-020	749921 25	2085307 31	0 0	0 5	Barium	470 00	mg/kg	224 00	26400 0	--	141 26
CN42-020	749921 25	2085307 31	0 0	0 5	Copper	45 00	mg/kg	3 00	40900 0	--	18 06
CN42-020	749921 25	2085307 31	0 0	0 5	Lead	27 10	mg/kg	6 00	1000 0	25 6	54 62
CN42-020	749921 25	2085307 31	0 0	0 5	Nickel	15 00	mg/kg	4 00	20400 0	--	14 91
CN42-020	749921 25	2085307 31	0 0	0 5	Strontium	292 00	mg/kg	18 00	613000 0	--	48 94
CN42-020	749921 25	2085307 31	0 0	0 5	Uranium, Total	9 64	mg/kg	3 58	2750 0	67 8	5 98
CN42-020	749921 25	2085307 31	0 0	0 5	Vanadium	64 50	mg/kg	18 00	7150 0	433 0	45 59
CN42-020	749921 25	2085307 31	0 0	0 5	Uranium-238	3 25	pCi/g	1 20	351 0	1600 0	2 00
CN42-020	749921 25	2085307 31	0 0	0 5	Uranium-235	0 19	pCi/g	0 09	8 0	1900 0	0 09
CN42-020	749921 25	2085307 31	0 0	0 5	Uranium-234	3 25	pCi/g	1 20	300 0	1800 0	2 25
CN42-020	749921 25	2085307 31	0 5	2 5	Arsenic	25 10	mg/kg	2 00	22 2	21 6	13 14
CN42-020	749921 25	2085307 31	0 5	2 5	Barium	428 00	mg/kg	224 00	26400 0	--	289 38
CN42-020	749921 25	2085307 31	0 5	2 5	Copper	41 60	mg/kg	3 00	40900 0	--	38 21
CN42-020	749921 25	2085307 31	0 5	2 5	Strontium	286 00	mg/kg	18 00	613000 0	--	211 38
CN42-020	749921 25	2085307 31	0 5	2 5	Uranium Total	10 80	mg/kg	4 51	2750 0	67 8	3 04
CN42-020	749921 25	2085307 31	0 5	2 5	Uranium-238	3 64	pCi/g	1 52	351 0	1600 0	1 49
CN42-020	749921 25	2085307 31	0 5	2 5	Uranium-235	0 20	pCi/g	0 13	8 0	1900 0	0 12
CN42-020	749921 25	2085307 31	0 5	2 5	Uranium-234	3 64	pCi/g	1 52	300 0	1800 0	2 64

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CN42-021	749833 28	2085419 26	0 0	0 5	Acetone	100 00	ug/kg	100 00	102000000 0	211000 0	--
CN42-021	749833 28	2085419 26	0 0	0 5	Arsenic	10 20	mg/kg	5 00	22 2	21 6	10 09
CN42-021	749833 28	2085419 26	0 0	0 5	Barium	762 00	mg/kg	98 00	26400 0	--	141 26
CN42-021	749833 28	2085419 26	0 0	0 5	Chromium	92 50	mg/kg	20 00	268 0	--	16 99
CN42-021	749833 28	2085419 26	0 0	0 5	Copper	141 00	mg/kg	4 00	40900 0	--	18 06
CN42-021	749833 28	2085419 26	0 0	0 5	Ethylbenzene	12 00	ug/kg	5 10	4250000 0	--	--
CN42-021	749833 28	2085419 26	0 0	0 5	Iron	40700 00	mg/kg	2190 00	307000 0	--	18037 00
CN42-021	749833 28	2085419 26	0 0	0 5	Manganese	520 00	mg/kg	158 00	3480 0	--	365 08
CN42-021	749833 28	2085419 26	0 0	0 5	Nickel	42 00	mg/kg	12 00	20400 0	--	14 91
CN42-021	749833 28	2085419 26	0 0	0 5	Strontium	288 00	mg/kg	20 00	613000 0	--	48 94
CN42-021	749833 28	2085419 26	0 0	0 5	Uranium, Total	12 07	mg/kg	5 32	2750 0	67 8	5 98
CN42-021	749833 28	2085419 26	0 0	0 5	Vanadium	95 40	mg/kg	31 00	7150 0	433 0	45 59
CN42-021	749833 28	2085419 26	0 0	0 5	Xylene	64 00	ug/kg	10 00	2040000 0	--	--
CN42-021	749833 28	2085419 26	0 0	0 5	Zinc	149 00	mg/kg	9 00	307000 0	--	73 76
CN42-021	749833 28	2085419 26	0 0	0 5	Uranium-238	4 07	pCi/g	1 79	351 0	1600 0	2 00
CN42-021	749833 28	2085419 26	0 0	0 5	Uranium-235	0 22	pCi/g	0 14	8 0	1900 0	0 09
CN42-021	749833 28	2085419 26	0 0	0 5	Uranium-234	4 07	pCi/g	1 79	300 0	1800 0	2 25
CN42-021	749833 28	2085419 26	0 5	2 5	Barium	670 00	mg/kg	98 00	26400 0	--	289 38
CN42-021	749833 28	2085419 26	0 5	2 5	Copper	148 00	mg/kg	4 00	40900 0	--	38 21
CN42-021	749833 28	2085419 26	0 5	2 5	Strontium	217 00	mg/kg	20 00	613000 0	--	211 38
CN42-021	749833 28	2085419 26	0 5	2 5	Uranium, Total	9 47	mg/kg	5 33	2750 0	67 8	3 04
CN42-021	749833 28	2085419 26	0 5	2 5	Vanadium	96 30	mg/kg	31 00	7150 0	433 0	88 49
CN42-021	749833 28	2085419 26	0 5	2 5	Uranium-238	3 19	pCi/g	1 79	351 0	1600 0	1 49
CN42-021	749833 28	2085419 26	0 5	2 5	Uranium-235	0 17	pCi/g	0 14	8 0	1900 0	0 12
CN42-021	749833 28	2085419 26	0 5	2 5	Uranium-234	3 19	pCi/g	1 79	300 0	1800 0	2 64
CN42-022	749829 06	2085487 91	0 0	0 5	Acetone	110 00	ug/kg	100 00	102000000 0	211000 0	--
CN42-022	749829 06	2085487 91	0 0	0 5	Arsenic	13 60	mg/kg	5 00	22 2	21 6	10 09
CN42-022	749829 06	2085487 91	0 0	0 5	Barium	965 00	mg/kg	98 00	26400 0	--	141 26
CN42-022	749829 06	2085487 91	0 0	0 5	Chromium	45 50	mg/kg	20 00	268 0	--	16 99
CN42-022	749829 06	2085487 91	0 0	0 5	Copper	128 00	mg/kg	4 00	40900 0	--	18 06

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Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CN42-022	749829 06	2085487 91	0 0	0 5	Ethylbenzene	68 00	ug/kg	5 10	4250000 0	--	--
CN42-022	749829 06	2085487 91	0 0	0 5	Iron	32100 00	mg/kg	2190 00	307000 0	--	18037 00
CN42-022	749829 06	2085487 91	0 0	0 5	Manganese	445 00	mg/kg	158 00	3480 0	--	365 08
CN42-022	749829 06	2085487 91	0 0	0 5	Nickel	36 50	mg/kg	12 00	20400 0	--	14 91
CN42-022	749829 06	2085487 91	0 0	0 5	Strontium	293 00	mg/kg	20 00	613000 0	--	48 94
CN42-022	749829 06	2085487 91	0 0	0 5	Toluene	62 00	ug/kg	5 10	31300000 0	128000 0	--
CN42-022	749829 06	2085487 91	0 0	0 5	Uranium, Total	9 97	mg/kg	5 66	2750 0	67 8	5 98
CN42-022	749829 06	2085487 91	0 0	0 5	Vanadium	59 00	mg/kg	31 00	7150 0	433 0	45 59
CN42-022	749829 06	2085487 91	0 0	0 5	Xylene	310 00	ug/kg	10 00	2040000 0	--	--
CN42-022	749829 06	2085487 91	0 0	0 5	Zinc	102 00	mg/kg	9 00	307000 0	--	73 76
CN42-022	749829 06	2085487 91	0 0	0 5	Uranium-238	3 36	pCi/g	1 91	351 0	1600 0	2 00
CN42-022	749829 06	2085487 91	0 0	0 5	Uranium-235	0 13	pCi/g	0 12	8 0	1900 0	0 09
CN42-022	749829 06	2085487 91	0 0	0 5	Uranium-234	3 36	pCi/g	1 91	300 0	1800 0	2 25
CN42-022	749829 06	2085487 91	0 5	2 5	Arsenic	13 30	mg/kg	5 00	22 2	21 6	13 14
CN42-022	749829 06	2085487 91	0 5	2 5	Barium	724 00	mg/kg	98 00	26400 0	--	289 38
CN42-022	749829 06	2085487 91	0 5	2 5	Copper	150 00	mg/kg	4 00	40900 0	--	38 21
CN42-022	749829 06	2085487 91	0 5	2 5	Strontium	241 00	mg/kg	20 00	613000 0	--	211 38
CN42-022	749829 06	2085487 91	0 5	2 5	Uranium, Total	9 34	mg/kg	5 07	2750 0	67 8	3 04
CN42-022	749829 06	2085487 91	0 5	2 5	Uranium-238	3 15	pCi/g	1 71	351 0	1600 0	1 49
CN42-022	749829 06	2085487 91	0 5	2 5	Uranium-235	0 14	pCi/g	0 12	8 0	1900 0	0 12
CN42-022	749829 06	2085487 91	0 5	2 5	Uranium-234	3 15	pCi/g	1 71	300 0	1800 0	2 64
CN42-023	749830 44	2085521 48	0 0	0 5	Aluminum	18000 00	mg/kg	2 70	228000 0	--	16902 00
CN42-023	749830 44	2085521 48	0 0	0 5	Beryllium	1 30	mg/kg	0 04	921 0	2 2	0 97
CN42-023	749830 44	2085521 48	0 0	0 5	Chromium	17 00	mg/kg	0 09	268 0	--	16 99
CN42-023	749830 44	2085521 48	0 0	0 5	Copper	20 00	mg/kg	0 25	40900 0	--	18 06
CN42-023	749830 44	2085521 48	0 0	0 5	Strontium	70 00	mg/kg	0 07	613000 0	--	48 94
CN42-023	749830 44	2085521 48	0 0	0 5	Xylene	22 00	ug/kg	10 00	2040000 0	--	--
CN42-023	749830 44	2085521 48	0 5	2 5	Barium	853 00	mg/kg	98 00	26400 0	--	289 38
CN42-023	749830 44	2085521 48	0 5	2 5	Copper	206 00	mg/kg	4 00	40900 0	--	38 21
CN42-023	749830 44	2085521 48	0 5	2 5	Strontium	263 00	mg/kg	20 00	613000 0	--	211 38

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Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RI	WRW AL	Ecological AL	Background
CN42-023	749830 44	2085521 48	0 5	2 5	Uranium, Total	9 41	mg/kg	5 93	2750 0	67 8	3 04
CN42-023	749830 44	2085521 48	0 5	2 5	Uranium-238	3 17	pCi/g	1 99	351 0	1600 0	1 49
CN42-023	749830 44	2085521 48	0 5	2 5	Uranium-235	0 16	pCi/g	0 13	8 0	1900 0	0 12
CN42-023	749830 44	2085521 48	0 5	2 5	Uranium-234	3 17	pCi/g	1 99	300 0	1800 0	2 64
CN42-024	749795 11	2085423 96	2 5	4 5	Barium	377 00	mg/kg	224 00	26400 0	--	289 38
CN42-024	749795 11	2085423 96	2 5	4 5	Copper	48 00	mg/kg	3 00	40900 0	--	38 21
CN42-024	749795 11	2085423 96	2 5	4 5	Trichloroethene	6 44	ug/kg	5 69	19600 0	509000 0	--
CN42-024	749795 11	2085423 96	2 5	4 5	Uranium, Total	11 17	mg/kg	5 30	2750 0	67 8	3 04
CN42-024	749795 11	2085423 96	2 5	4 5	Vanadium	173 00	mg/kg	18 00	7150 0	433 0	88 49
CN42-024	749795 11	2085423 96	2 5	4 5	Uranium-238	3 76	pCi/g	1 79	351 0	1600 0	1 49
CN42-024	749795 11	2085423 96	2 5	4 5	Uranium-235	0 29	pCi/g	0 14	8 0	1900 0	0 12
CN42-024	749795 11	2085423 96	2 5	4 5	Uranium-234	3 76	pCi/g	1 79	300 0	1800 0	2 64
CN43-000	749978 00	2085480 00	0 0	0 5	Aluminum	37000 00	mg/kg	5 90	228000 0	--	35373 17
CN43-000	749978 00	2085480 00	0 0	0 5	Copper	82 00	mg/kg	0 06	40900 0	--	38 21
CN43-000	749978 00	2085480 00	0 0	0 5	Lead	26 00	mg/kg	0 33	1000 0	25 6	24 97
CN43-000	749978 00	2085480 00	0 0	0 5	Uranium, Total	8 74	mg/kg	5 32	2750 0	67 8	3 04
CN43-000	749978 00	2085480 00	0 0	0 5	Uranium-238	2 94	pCi/g	1 79	351 0	1600 0	1 49
CN43-000	749978 00	2085480 00	0 0	0 5	Uranium-235	0 30	pCi/g	0 17	8 0	1900 0	0 12
CN43-000	749978 00	2085480 00	0 0	0 5	Uranium-234	2 94	pCi/g	1 79	300 0	1800 0	2 64
CN43-000	749978 00	2085480 00	0 5	1 0	Lead	28 00	mg/kg	0 32	1000 0	25 6	24 97
CN43-000	749978 00	2085480 00	0 5	1 0	Uranium, Total	17 67	mg/kg	4 38	2750 0	67 8	3 04
CN43-000	749978 00	2085480 00	0 5	1 0	Uranium-238	5 95	pCi/g	1 48	351 0	1600 0	1 49
CN43-000	749978 00	2085480 00	0 5	1 0	Uranium-234	5 95	pCi/g	1 48	300 0	1800 0	2 64
CN43-002	749956 00	2085375 00	0 5	1 0	Copper	45 00	mg/kg	0 05	40900 0	--	38 21
CN43-002	749956 00	2085375 00	0 5	1 0	Uranium, Total	12 22	mg/kg	5 75	2750 0	67 8	3 04
CN43-002	749956 00	2085375 00	0 5	1 0	Uranium-238	4 11	pCi/g	1 94	351 0	1600 0	1 49
CN43-002	749956 00	2085375 00	0 5	1 0	Uranium-235	0 27	pCi/g	0 14	8 0	1900 0	0 12
CN43-002	749956 00	2085375 00	0 5	1 0	Uranium-234	4 11	pCi/g	1 94	300 0	1800 0	2 64
CN43-002	749956 00	2085375 00	1 0	1 5	Copper	62 00	mg/kg	0 04	40900 0	--	38 21
CN43-002	749956 00	2085375 00	1 0	1 5	Uranium, Total	12 76	mg/kg	5 63	2750 0	67 8	3 04

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Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CN43-002	749956 00	2085375 00	1 0	1 5	Uranium-238	4 30	pCi/g	1 90	351 0	1600 0	1 49
CN43-002	749956 00	2085375 00	1 0	1 5	Uranium-235	0 34	pCi/g	0 15	8 0	1900 0	0 12
CN43-002	749956 00	2085375 00	1 0	1 5	Uranium-234	4 30	pCi/g	1 90	300 0	1800 0	2 64
CN43-003	750098 00	2085520 00	1 3	1 8	Uranium Total	7 06	mg/kg	4 07	2750 0	67 8	3 04
CN43-003	750098 00	2085520 00	1 3	1 8	Uranium-238	2 38	pCi/g	1 37	351 0	1600 0	1 49
CN43-003	750098 00	2085520 00	1 3	1 8	Uranium-235	0 17	pCi/g	0 14	8 0	1900 0	0 12
CN43-003	750098 00	2085520 00	1 8	2 3	Uranium Total	6 57	mg/kg	3 83	2750 0	67 8	3 04
CN43-003	750098 00	2085520 00	1 8	2 3	Uranium-238	2 21	pCi/g	1 29	351 0	1600 0	1 49
CN44-001	750192 00	2085520 00	0 0	0 5	Uranium Total	5 92	mg/kg	3 69	2750 0	67 8	3 04
CN44-001	750192 00	2085520 00	0 0	0 5	Uranium-238	1 99	pCi/g	1 24	351 0	1600 0	1 49
CN44-001	750192 00	2085520 00	0 5	1 0	Arsenic	40 00	mg/kg	0 88	22 2	21 6	13 14
CN44-001	750192 00	2085520 00	0 5	1 0	Uranium Total	7 08	mg/kg	3 77	2750 0	67 8	3 04
CN44-001	750192 00	2085520 00	0 5	1 0	Uranium-238	2 39	pCi/g	1 27	351 0	1600 0	1 49
CN44-001	750192 00	2085520 00	0 5	1 0	Uranium-235	0 15	pCi/g	0 12	8 0	1900 0	0 12
CO42-000	749912 00	2085600 00	0 5	1 0	Uranium Total	10 87	mg/kg	7 31	2750 0	67 8	3 04
CO42-000	749912 00	2085600 00	0 5	1 0	Uranium-238	3 66	pCi/g	2 46	351 0	1600 0	1 49
CO42-000	749912 00	2085600 00	0 5	1 0	Uranium-234	3 66	pCi/g	2 46	300 0	1800 0	2 64
CO42-000	749912 00	2085600 00	1 0	1 5	Uranium Total	15 98	mg/kg	4 69	2750 0	67 8	3 04
CO42-000	749912 00	2085600 00	1 0	1 5	Uranium-238	5 38	pCi/g	1 58	351 0	1600 0	1 49
CO42-000	749912 00	2085600 00	1 0	1 5	Uranium-235	0 27	pCi/g	0 13	8 0	1900 0	0 12
CO42-000	749912 00	2085600 00	1 0	1 5	Uranium-234	5 38	pCi/g	1 58	300 0	1800 0	2 64
CO42-001	749870 00	2085543 00	1 0	1 5	Copper	39 00	mg/kg	0 05	40900 0	--	38 21
CO42-001	749870 00	2085543 00	1 0	1 5	Uranium Total	7 25	mg/kg	5 11	2750 0	67 8	3 04
CO42-001	749870 00	2085543 00	1 0	1 5	Uranium-238	2 44	pCi/g	1 72	351 0	1600 0	1 49
CO42-006	749940 00	2085530 00	0 5	1 0	Copper	77 00	mg/kg	0 05	40900 0	--	38 21
CO42-006	749940 00	2085530 00	0 5	1 0	Uranium Total	6 93	mg/kg	4 85	2750 0	67 8	3 04
CO42-006	749940 00	2085530 00	0 5	1 0	Uranium-238	2 33	pCi/g	1 63	351 0	1600 0	1 49
CO42-006	749940 00	2085530 00	0 5	1 0	Uranium-235	0 18	pCi/g	0 14	8 0	1900 0	0 12
CO42-007	749963 65	2085595 66	2 5	4 5	Barium	690 00	mg/kg	98 00	26400 0	--	289 38
CO42-007	749963 65	2085595 66	2 5	4 5	Copper	103 00	mg/kg	4 00	40900 0	--	38 21

Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW/AL	Ecological AL	Background
CO42-007	749963 65	2085595 66	2.5	4.5	Strontium	269 00	mg/kg	20 00	613000 0	--	211 38
CO42-007	749963 65	2085595 66	2.5	4.5	Uranium, Total	11 80	mg/kg	5.54	2750 0	67.8	3.04
CO42-007	749963 65	2085595 66	2.5	4.5	Vanadium	159 00	mg/kg	31 00	7150 0	433 0	88 49
CO42-007	749963 65	2085595 66	2.5	4.5	Uranium-238	3 97	pCi/g	1 86	351 0	1600 0	1 49
CO42-007	749963 65	2085595 66	2.5	4.5	Uranium-235	0 20	pCi/g	0 16	8 0	1900 0	0 12
CO42-007	749963 65	2085595 66	2.5	4.5	Uranium-234	3 97	pCi/g	1 86	300 0	1800 0	2 64
CO42-008	749960 97	2085675 47	2.5	4.5	Barium	567 00	mg/kg	98 00	26400 0	--	289 38
CO42-008	749960 97	2085675 47	2.5	4.5	Copper	126 00	mg/kg	4 00	40900 0	--	38 21
CO42-008	749960 97	2085675 47	2.5	4.5	Uranium, Total	13 15	mg/kg	5.79	2750 0	67.8	3.04
CO42-008	749960 97	2085675 47	2.5	4.5	Vanadium	205 00	mg/kg	31 00	7150 0	433 0	88 49
CO42-008	749960 97	2085675 47	2.5	4.5	Uranium-238	4 43	pCi/g	1 95	351 0	1600 0	1 49
CO42-008	749960 97	2085675 47	2.5	4.5	Uranium-235	0 18	pCi/g	0 15	8 0	1900 0	0 12
CO42-008	749960 97	2085675 47	2.5	4.5	Uranium-234	4 43	pCi/g	1 95	300 0	1800 0	2 64
CO42-009*	749869 62	2085575 52	0 0	0 5	Beryllium	3 50	mg/kg	0 17	921 0	2 2	7 73
CO42-009	749869 62	2085575 52	0 0	0 5	Cadmium	56 00	mg/kg	0 11	962 0	-	1 88
CO42-009	749869 62	2085575 52	0 0	0 5	Chromium	94 00	mg/kg	0 25	268 0	-	23 23
CO42-009	749869 62	2085575 52	0 0	0 5	Copper	370 00	mg/kg	0 08	40900 0	-	27 27
CO42-009	749869 62	2085575 52	0 0	0 5	Iron	23000 00	mg/kg	2 30	307000 0	-	21379 01
CO42-009*	749869 62	2085575 52	0 0	0 5	Lead	230 00	mg/kg	0 44	1000 0	25 6	95 60
CO42-009	749869 62	2085575 52	0 0	0 5	Mercury	1 10	mg/kg	0 01	25200 0	-	0 34
CO42-009	749869 62	2085575 52	0 0	0 5	Nickel	37 00	mg/kg	0 32	20400 0	-	17 89
CO42-009	749869 62	2085575 52	0 0	0 5	Silver	8 00	mg/kg	0 13	5110 0	-	2 28
CO42-009	749869 62	2085575 52	0 0	0 5	Uranium, Total	9 70	mg/kg	2 30	2750 0	67.8	-
CO43-001	750001 25	2085588 43	2.5	4.5	Zinc	930 00	mg/kg	0 75	307000 0	-	104 40
CO43-001	750001 25	2085588 43	2.5	4.5	Barium	477 00	mg/kg	98 00	26400 0	--	289 38
CO43-001	750001 25	2085588 43	2.5	4.5	Copper	122 00	mg/kg	4 00	40900 0	--	38 21
CO43-001	750001 25	2085588 43	2.5	4.5	Uranium Total	18 11	mg/kg	5 34	2750 0	67.8	3 04
CO43-001	750001 25	2085588 43	2.5	4.5	Vanadium	214 00	mg/kg	31 00	7150 0	433 0	88 49
CO43-001	750001 25	2085588 43	2.5	4.5	Uranium-238	6 10	pCi/g	1 80	351 0	1600 0	1 49
CO43-001	750001 25	2085588 43	2.5	4.5	Uranium-235	0 30	pCi/g	0 18	8 0	1900 0	0 12
CO43-001	750001 25	2085588 43	2.5	4.5	Uranium-234	6 10	pCi/g	1 80	300 0	1800 0	2 64

Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CQ42-002	749902 28	2086086 65	0 0	0 5	Antimony	12 40	mg/kg	7 00	409 0	--	0 47
CQ42-002	749902 28	2086086 65	0 0	0 5	Arsenic	17 40	mg/kg	5 00	22 2	21 6	10 09
CQ42-002	749902 28	2086086 65	0 0	0 5	Barium	597 00	mg/kg	98 00	26400 0	--	141 26
CQ42-002	749902 28	2086086 65	0 0	0 5	Chromium	30 80	mg/kg	20 00	268 0	--	16 99
CQ42-002	749902 28	2086086 65	0 0	0 5	Copper	85 80	mg/kg	4 00	40900 0	--	18 06
CQ42-002	749902 28	2086086 65	0 0	0 5	Iron	18300 00	mg/kg	2190 00	307000 0	--	18037 00
CQ42-002	749902 28	2086086 65	0 0	0 5	Lead	32 60	mg/kg	7 00	1000 0	25 6	54 62
CQ42-002	749902 28	2086086 65	0 0	0 5	Nickel	25 80	mg/kg	12 00	20400 0	--	14 91
CQ42-002	749902 28	2086086 65	0 0	0 5	Strontium	252 00	mg/kg	20 00	613000 0	--	48 94
CQ42-002	749902 28	2086086 65	0 0	0 5	Uranium, Total	17 71	mg/kg	4 80	2750 0	67 8	5 98
CQ42-002	749902 28	2086086 65	0 0	0 5	Zinc	120 00	mg/kg	9 00	307000 0	--	73 76
CQ42-002	749902 28	2086086 65	0 0	0 5	Uranium-238	5 96	pCi/g	1 62	351 0	1600 0	2 00
CQ42-002	749902 28	2086086 65	0 0	0 5	Uranium-235	0 22	pCi/g	0 14	8 0	1900 0	0 09
CQ42-002	749902 28	2086086 65	0 0	0 5	Uranium-234	5 96	pCi/g	1 62	300 0	1800 0	2 25
CQ42-003	749928 91	2086062 42	0 0	0 5	Antimony	7 48	mg/kg	7 00	409 0	--	0 47
CQ42-003	749928 91	2086062 42	0 0	0 5	Arsenic	17 70	mg/kg	5 00	22 2	21 6	10 09
CQ42-003	749928 91	2086062 42	0 0	0 5	Barium	681 00	mg/kg	98 00	26400 0	--	141 26
CQ42-003	749928 91	2086062 42	0 0	0 5	Chromium	38 30	mg/kg	20 00	268 0	--	16 99
CQ42-003	749928 91	2086062 42	0 0	0 5	Copper	114 00	mg/kg	4 00	40900 0	--	18 06
CQ42-003	749928 91	2086062 42	0 0	0 5	Iron	24600 00	mg/kg	2190 00	307000 0	--	18037 00
CQ42-003	749928 91	2086062 42	0 0	0 5	Lead	32 30	mg/kg	7 00	1000 0	25 6	54 62
CQ42-003	749928 91	2086062 42	0 0	0 5	Manganese	398 00	mg/kg	158 00	3480 0	--	365 08
CQ42-003	749928 91	2086062 42	0 0	0 5	Nickel	32 10	mg/kg	12 00	20400 0	--	14 91
CQ42-003	749928 91	2086062 42	0 0	0 5	Strontium	273 00	mg/kg	20 00	613000 0	--	48 94
CQ42-003	749928 91	2086062 42	0 0	0 5	Uranium Total	15 86	mg/kg	5 84	2750 0	67 8	5 98
CQ42-003	749928 91	2086062 42	0 0	0 5	Zinc	232 00	mg/kg	9 00	307000 0	--	73 76
CQ42-003	749928 91	2086062 42	0 0	0 5	Uranium-238	5 34	pCi/g	1 97	351 0	1600 0	2 00
CQ42-003	749928 91	2086062 42	0 0	0 5	Uranium-235	0 18	pCi/g	0 11	8 0	1900 0	0 09
CQ42-003	749928 91	2086062 42	0 0	0 5	Uranium-234	5 34	pCi/g	1 97	300 0	1800 0	2 25
CQ42-004	749955 54	2086038 25	0 0	0 5	Arsenic	19 60	mg/kg	5 00	22 2	21 6	10 09

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Closeout Report for IHSS Group 900-1

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW-AL	Ecological AL	Background
CQ42-004	749955 54	2086038 25	0 0	0 5	Barium	531 00	mg/kg	98 00	26400 0	--	141 26
CQ42-004	749955 54	2086038 25	0 0	0 5	Chromium	20 50	mg/kg	20 00	268 0	--	16 99
CQ42-004	749955 54	2086038 25	0 0	0 5	Copper	159 00	mg/kg	4 00	40900 0	--	18 06
CQ42-004	749955 54	2086038 25	0 0	0 5	Iron	27000 00	mg/kg	2190 00	307000 0	--	18037 00
CQ42-004	749955 54	2086038 25	0 0	0 5	Manganese	602 00	mg/kg	158 00	3480 0	--	365 08
CQ42-004	749955 54	2086038 25	0 0	0 5	Nickel	30 30	mg/kg	12 00	20400 0	--	14 91
CQ42-004	749955 54	2086038 25	0 0	0 5	Strontium	296 00	mg/kg	20 00	613000 0	--	48 94
CQ42-004	749955 54	2086038 25	0 0	0 5	Tin	4 84	mg/kg	4 00	613000 0	--	2 90
CQ42-004	749955 54	2086038 25	0 0	0 5	Uranium Total	10 22	mg/kg	4 85	2750 0	67 8	5 98
CQ42-004	749955 54	2086038 25	0 0	0 5	Zinc	152 00	mg/kg	9 00	307000 0	--	73 76
CQ42-004	749955 54	2086038 25	0 0	0 5	Uranium-238	3 44	pCi/g	1 63	351 0	1600 0	2 00
CQ42-004	749955 54	2086038 25	0 0	0 5	Uranium-235	0 19	pCi/g	0 15	8 0	1900 0	0 09
CQ42-004	749955 54	2086038 25	0 0	0 5	Uranium-234	3 44	pCi/g	1 63	300 0	1800 0	2 25
CQ42-005	749909 91	2086121 79	0 0	0 5	Arsenic	13 20	mg/kg	5 00	22 2	21 6	10 09
CQ42-005	749909 91	2086121 79	0 0	0 5	Barium	670 00	mg/kg	98 00	26400 0	--	141 26
CQ42-005	749909 91	2086121 79	0 0	0 5	Chromium	35 20	mg/kg	20 00	268 0	--	16 99
CQ42-005	749909 91	2086121 79	0 0	0 5	Copper	149 00	mg/kg	4 00	40900 0	--	18 06
CQ42-005	749909 91	2086121 79	0 0	0 5	Iron	29700 00	mg/kg	2190 00	307000 0	--	18037 00
CQ42-005	749909 91	2086121 79	0 0	0 5	Lead	40 20	mg/kg	7 00	1000 0	25 6	54 62
CQ42-005	749909 91	2086121 79	0 0	0 5	Manganese	515 00	mg/kg	158 00	3480 0	--	365 08
CQ42-005	749909 91	2086121 79	0 0	0 5	Nickel	39 70	mg/kg	12 00	20400 0	--	14 91
CQ42-005	749909 91	2086121 79	0 0	0 5	Strontium	253 00	mg/kg	20 00	613000 0	--	48 94
CQ42-005	749909 91	2086121 79	0 0	0 5	Uranium Total	10 19	mg/kg	4 95	2750 0	67 8	5 98
CQ42-005	749909 91	2086121 79	0 0	0 5	Zinc	165 00	mg/kg	9 00	307000 0	--	73 76
CQ42-005	749909 91	2086121 79	0 0	0 5	Uranium-238	3 43	pCi/g	1 67	351 0	1600 0	2 00
CQ42-005	749909 91	2086121 79	0 0	0 5	Uranium-235	0 33	pCi/g	0 18	8 0	1900 0	0 09
CQ42-005	749909 91	2086121 79	0 0	0 5	Uranium-234	3 43	pCi/g	1 67	300 0	1800 0	2 25
CQ42-006	749936 54	2086097 58	0 0	0 5	Arsenic	10 60	mg/kg	5 00	22 2	21 6	10 09
CQ42-006	749936 54	2086097 58	0 0	0 5	Barium	903 00	mg/kg	98 00	26400 0	--	141 26
CQ42-006	749936 54	2086097 58	0 0	0 5	Chromium	38 40	mg/kg	20 00	268 0	--	16 99

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRWAL	Ecological AL	Background
CQ42-006	749936 54	2086097 58	0 0	0 5	Copper	140 00	mg/kg	4 00	40900 0	--	18 06
CQ42-006	749936 54	2086097 58	0 0	0 5	Iron	30200 00	mg/kg	2190 00	307000 0	--	18037 00
CQ42-006	749936 54	2086097 58	0 0	0 5	Lead	37 40	mg/kg	7 00	1000 0	25 6	54 62
CQ42-006	749936 54	2086097 58	0 0	0 5	Manganese	368 00	mg/kg	158 00	3480 0	--	365 08
CQ42-006	749936 54	2086097 58	0 0	0 5	Nickel	43 00	mg/kg	12 00	20400 0	--	14 91
CQ42-006	749936 54	2086097 58	0 0	0 5	Strontium	198 00	mg/kg	20 00	613000 0	--	48 94
CQ42-006	749936 54	2086097 58	0 0	0 5	Tin	5 39	mg/kg	4 00	613000 0	--	2 90
<i>CQ42-006</i>	<i>749936 54</i>	<i>2086097 58</i>	<i>0 0</i>	<i>0 5</i>	<i>Uranium Total</i>	<i>26 78</i>	<i>mg/kg</i>	<i>6 79</i>	<i>2750 0</i>	<i>67 8</i>	<i>5 98</i>
CQ42-006	749936 54	2086097 58	0 0	0 5	Vanadium	151 00	mg/kg	31 00	7150 0	433 0	45 59
CQ42-006	749936 54	2086097 58	0 0	0 5	Zinc	166 00	mg/kg	9 00	307000 0	--	73 76
CQ42-006	749936 54	2086097 58	0 0	0 5	Uranium-238	9 02	pCi/g	2 28	351 0	1600 0	2 00
<i>CQ42-006</i>	<i>749936 54</i>	<i>2086097 58</i>	<i>0 0</i>	<i>0 5</i>	<i>Uranium-234</i>	<i>9 02</i>	<i>pCi/g</i>	<i>2 28</i>	<i>300 0</i>	<i>1800 0</i>	<i>2 25</i>
CQ42-007	749944 19	2086132 78	0 0	0 5	Barium	657 00	mg/kg	98 00	26400 0	--	141 26
CQ42-007	749944 19	2086132 78	0 0	0 5	Cadmium	7 42	mg/kg	3 00	962 0	--	1 61
CQ42-007	749944 19	2086132 78	0 0	0 5	Chromium	44 50	mg/kg	20 00	268 0	--	16 99
CQ42-007	749944 19	2086132 78	0 0	0 5	Copper	114 00	mg/kg	4 00	40900 0	--	18 06
CQ42-007	749944 19	2086132 78	0 0	0 5	Iron	28800 00	mg/kg	2190 00	307000 0	--	18037 00
CQ42-007	749944 19	2086132 78	0 0	0 5	Lead	92 60	mg/kg	7 00	1000 0	25 6	54 62
CQ42-007	749944 19	2086132 78	0 0	0 5	Manganese	519 00	mg/kg	158 00	3480 0	--	365 08
CQ42-007	749944 19	2086132 78	0 0	0 5	Nickel	40 50	mg/kg	12 00	20400 0	--	14 91
CQ42-007	749944 19	2086132 78	0 0	0 5	Selenium	2 03	mg/kg	1 00	5110 0	--	1 22
CQ42-007	749944 19	2086132 78	0 0	0 5	Strontium	228 00	mg/kg	20 00	613000 0	--	48 94
CQ42-007	749944 19	2086132 78	0 0	0 5	Tin	19 50	mg/kg	4 00	613000 0	--	2 90
<i>CQ42-007</i>	<i>749944 19</i>	<i>2086132 78</i>	<i>0 0</i>	<i>0 5</i>	<i>Uranium, Total</i>	<i>12 74</i>	<i>mg/kg</i>	<i>5 59</i>	<i>2750 0</i>	<i>67 8</i>	<i>5 98</i>
CQ42-007	749944 19	2086132 78	0 0	0 5	Vanadium	119 00	mg/kg	31 00	7150 0	433 0	45 59
CQ42-007	749944 19	2086132 78	0 0	0 5	Zinc	311 00	mg/kg	9 00	307000 0	--	73 76
CQ42-007	749944 19	2086132 78	0 0	0 5	Uranium-238	4 29	pCi/g	1 88	351 0	1600 0	2 00
CQ42-007	749944 19	2086132 78	0 0	0 5	Uranium-235	0 22	pCi/g	0 11	8 0	1900 0	0 09
<i>CQ42-007</i>	<i>749944 19</i>	<i>2086132 78</i>	<i>0 0</i>	<i>0 5</i>	<i>Uranium-234</i>	<i>4 29</i>	<i>pCi/g</i>	<i>1 88</i>	<i>300 0</i>	<i>1800 0</i>	<i>2 25</i>
CQ42-008	749956 47	2086085 02	8 0	9 0	Barium	559 00	mg/kg	98 00	26400 0	--	289 38

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRWAL	Ecological AL	Background
CQ42-008	749956 47	2086085 02	8 0	9 0	Copper	88 80	mg/kg	4 00	40900 0	--	38 21
CQ42-008	749956 47	2086085 02	8 0	9 0	Uranium, Total	11 74	mg/kg	5 18	2750 0	67 8	3 04
CQ42-008	749956 47	2086085 02	8 0	9 0	Vanadium	174 00	mg/kg	31 00	7150 0	433 0	88 49
CQ42-008	749956 47	2086085 02	8 0	9 0	Zinc	159 00	mg/kg	9 00	307000 0	--	139 10
CQ42-008	749956 47	2086085 02	8 0	9 0	Uranium-238	3 95	pCi/g	1 74	351 0	1600 0	1 49
CQ42-008	749956 47	2086085 02	8 0	9 0	Uranium-235	0 27	pCi/g	0 15	8 0	1900 0	0 12
CQ42-008	749956 47	2086085 02	8 0	9 0	Uranium-234	3 95	pCi/g	1 74	300 0	1800 0	2 64
CQ43-000	749963 25	2086073 39	0 0	0 5	Aluminum	20000 00	mg/kg	2 60	228000 0	--	16902 00
CQ43-000	749963 25	2086073 39	0 0	0 5	Beryllium	1 20	mg/kg	0 04	921 0	2 2	0 97
CQ43-000	749963 25	2086073 39	0 0	0 5	Chromium	18 00	mg/kg	0 09	268 0	--	16 99
CQ43-000	749963 25	2086073 39	0 0	0 5	Copper	22 00	mg/kg	0 23	40900 0	--	18 06
CQ43-000	749963 25	2086073 39	0 0	0 5	Iron	19000 00	mg/kg	2 00	307000 0	--	18037 00
CQ43-000	749963 25	2086073 39	0 0	0 5	Nickel	29 00	mg/kg	0 22	20400 0	--	14 91
CQ43-000	749963 25	2086073 39	0 0	0 5	Strontium	100 00	mg/kg	0 06	613000 0	--	48 94
CQ43-000	749963 25	2086073 39	0 0	0 5	Zinc	90 00	mg/kg	0 65	307000 0	--	73 76
CQ43-001	749989 87	2086049 16	0 0	0 5	Antimony	8 18	mg/kg	7 00	409 0	--	0 47
CQ43-001	749989 87	2086049 16	0 0	0 5	Barium	601 00	mg/kg	98 00	26400 0	--	141 26
CQ43-001	749989 87	2086049 16	0 0	0 5	Chromium	33 20	mg/kg	20 00	268 0	--	16 99
CQ43-001	749989 87	2086049 16	0 0	0 5	Copper	103 00	mg/kg	4 00	40900 0	--	18 06
CQ43-001	749989 87	2086049 16	0 0	0 5	Iron	23600 00	mg/kg	2190 00	307000 0	--	18037 00
CQ43-001	749989 87	2086049 16	0 0	0 5	Lead	31 40	mg/kg	7 00	1000 0	25 6	54 62
CQ43-001	749989 87	2086049 16	0 0	0 5	Nickel	35 40	mg/kg	12 00	20400 0	--	14 91
CQ43-001	749989 87	2086049 16	0 0	0 5	Strontium	164 00	mg/kg	20 00	613000 0	--	48 94
CQ43-001	749989 87	2086049 16	0 0	0 5	Uranium, Total	10 03	mg/kg	5 50	2750 0	67 8	5 98
CQ43-001	749989 87	2086049 16	0 0	0 5	Vanadium	116 00	mg/kg	31 00	7150 0	433 0	45 59
CQ43-001	749989 87	2086049 16	0 0	0 5	Zinc	137 00	mg/kg	9 00	307000 0	--	73 76
CQ43-001	749989 87	2086049 16	0 0	0 5	Uranium-238	3 38	pCi/g	1 85	351 0	1600 0	2 00
CQ43-001	749989 87	2086049 16	0 0	0 5	Uranium-234	3 38	pCi/g	1 85	300 0	1800 0	2 25
CQ43-002	749970 86	2086108 54	0 0	0 5	Barium	731 00	mg/kg	98 00	26400 0	--	141 26
CQ43-002	749970 86	2086108 54	0 0	0 5	Cadmium	9 42	mg/kg	3 00	962 0	--	1 61

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRW AL	Ecological AL	Background
CQ43-002	749970 86	2086108 54	0 0	0 5	Chromium	29 40	mg/kg	20 00	268 0	--	16 99
CQ43-002	749970 86	2086108 54	0 0	0 5	Copper	178 00	mg/kg	4 00	40900 0	--	18 06
CQ43-002	749970 86	2086108 54	0 0	0 5	Iron	25500 00	mg/kg	2190 00	307000 0	--	18037 00
CQ43-002	749970 86	2086108 54	0 0	0 5	Lead	241 00	mg/kg	7 00	1000 0	25 6	54 62
CQ43-002	749970 86	2086108 54	0 0	0 5	Manganese	443 00	mg/kg	158 00	3480 0	--	365 08
CQ43-002	749970 86	2086108 54	0 0	0 5	Nickel	31 00	mg/kg	12 00	20400 0	--	14 91
CQ43-002	749970 86	2086108 54	0 0	0 5	Selenium	1 30	mg/kg	1 00	5110 0	--	1 22
CQ43-002	749970 86	2086108 54	0 0	0 5	Strontium	262 00	mg/kg	20 00	613000 0	--	48 94
CQ43-002	749970 86	2086108 54	0 0	0 5	Tin	14 30	mg/kg	4 00	613000 0	--	2 90
CQ43-002	749970 86	2086108 54	0 0	0 5	<i>Uranium Total</i>	7 10	mg/kg	5 76	2750 0	67 8	5 98
CQ43-002	749970 86	2086108 54	0 0	0 5	Zinc	1970 00	mg/kg	9 00	307000 0	--	73 76
CQ43-002	749970 86	2086108 54	0 0	0 5	Uranium-238	2 39	pCi/g	1 94	351 0	1600 0	2 00
CQ43-002	749970 86	2086108 54	0 0	0 5	Uranium-235	0 33	pCi/g	0 20	8 0	1900 0	0 09
CQ43-002	749970 86	2086108 54	0 0	0 5	<i>Uranium-234</i>	2 39	pCi/g	1 94	300 0	1800 0	2 25
CQ43-003	749997 53	2086084 36	0 0	0 5	Barium	463 00	mg/kg	98 00	26400 0	--	141 26
CQ43-003	749997 53	2086084 36	0 0	0 5	Chromium	38 10	mg/kg	20 00	268 0	--	16 99
CQ43-003	749997 53	2086084 36	0 0	0 5	Copper	114 00	mg/kg	4 00	40900 0	--	18 06
CQ43-003	749997 53	2086084 36	0 0	0 5	Iron	25700 00	mg/kg	2190 00	307000 0	--	18037 00
CQ43-003	749997 53	2086084 36	0 0	0 5	Lead	40 40	mg/kg	7 00	1000 0	25 6	54 62
CQ43-003	749997 53	2086084 36	0 0	0 5	Nickel	36 90	mg/kg	12 00	20400 0	--	14 91
CQ43-003	749997 53	2086084 36	0 0	0 5	Strontium	169 00	mg/kg	20 00	613000 0	--	48 94
CQ43-003	749997 53	2086084 36	0 0	0 5	Tin	6 82	mg/kg	4 00	613000 0	--	2 90
CQ43-003	749997 53	2086084 36	0 0	0 5	<i>Uranium Total</i>	12 21	mg/kg	6 35	2750 0	67 8	5 98
CQ43-003	749997 53	2086084 36	0 0	0 5	Vanadium	135 00	mg/kg	31 00	7150 0	433 0	45 59
CQ43-003	749997 53	2086084 36	0 0	0 5	Zinc	237 00	mg/kg	9 00	307000 0	--	73 76
CQ43-003	749997 53	2086084 36	0 0	0 5	Uranium-238	4 11	pCi/g	2 14	351 0	1600 0	2 00
CQ43-003	749997 53	2086084 36	0 0	0 5	Uranium-235	0 24	pCi/g	0 19	8 0	1900 0	0 09
CQ43-003	749997 53	2086084 36	0 0	0 5	<i>Uranium-234</i>	4 11	pCi/g	2 14	300 0	1800 0	2 25
CQ43-004	750005 11	2086119 53	0 0	0 5	Barium	507 00	mg/kg	98 00	26400 0	--	141 26
CQ43-004	750005 11	2086119 53	0 0	0 5	Chromium	45 00	mg/kg	20 00	268 0	--	16 99

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Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	Analyte	Result	Unit	RL	WRV AL	Ecological AL	Background
CQ43-004	750005 11	2086119 53	0 0	0 5	Copper	170 00	mg/kg	4 00	40900 0	--	18 06
CQ43-004	750005 11	2086119 53	0 0	0 5	Iron	29800 00	mg/kg	2190 00	307000 0	--	18037 00
CQ43-004	750005 11	2086119 53	0 0	0 5	Lead	31 10	mg/kg	7 00	1000 0	25 6	54 62
CQ43-004	750005 11	2086119 53	0 0	0 5	Nickel	41 20	mg/kg	12 00	20400 0	--	14 91
CQ43-004	750005 11	2086119 53	0 0	0 5	Strontium	151 00	mg/kg	20 00	613000 0	--	48 94
<i>CQ43-004</i>	<i>750005 11</i>	<i>2086119 53</i>	<i>0 0</i>	<i>0 5</i>	<i>Uranium, Total</i>	<i>12 99</i>	<i>mg/kg</i>	<i>6 65</i>	<i>2750 0</i>	<i>67 8</i>	<i>5 98</i>
CQ43-004	750005 11	2086119 53	0 0	0 5	Vanadium	150 00	mg/kg	31 00	7150 0	433 0	45 59
CQ43-004	750005 11	2086119 53	0 0	0 5	Zinc	149 00	mg/kg	9 00	307000 0	--	73 76
CQ43-004	750005 11	2086119 53	0 0	0 5	Uranium-238	4 38	pCi/g	2 24	351 0	1600 0	2 00
<i>CQ43-004</i>	<i>750005 11</i>	<i>2086119 53</i>	<i>0 0</i>	<i>0 5</i>	<i>Uranium-234</i>	<i>4 38</i>	<i>pCi/g</i>	<i>2 24</i>	<i>300 0</i>	<i>1800 0</i>	<i>2 25</i>

* Denotes a sediment sample

Bold text indicates a result exceeded a RFCA AL

Italic font indicates the result was derived from an HPGe value

No action was taken to remove the soil with the elevated arsenic concentrations. A 95% upper confidence limit calculation was conducted to evaluate the one surface soil WRW exceedance, and the result was less than 1 (0.73). Additionally, the detected concentrations were in the range of background concentrations historically seen at RFETS. The 40 mg/kg concentration in subsurface soil was detected at a depth of over 20 feet below ground surface, beneath the Building 998 vault. The potential ecological risk associated with arsenic, beryllium and lead concentrations in soil and sediment greater than the ecological receptor ALs will be evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and the ecological portion of the Sitewide Comprehensive Risk Assessment (CRA).

One surface soil sample just north of the Building 993 site (CQ43-003) was to be analyzed for explosive residues using Method SW846 8330. However, based on the analytical results for other samples collected in the area, the analysis was not conducted. Refer to Regulatory Contact Record dated February 26, 2004, in Appendix A.

The sediment sample from Location CO42-009, an exterior drain just east of the Building 991 basement door, was too small to meet the Program DQOs. Not enough sample volume could be obtained. In addition, the sample is most likely only representative of recent discharges. Due to the slope in the drain at that location, it does not appear that the sample is representative of historical discharges from the building nor is a good indicator of potential soil contamination.

2.8 Sums of Ratios and Area of Concern

RFCA sums of ratios (SORs) were calculated for the IHSS Group 900-1 sampling locations based on the accelerated action analytical data for the contaminants of concern and the WRW ALs. Surface and subsurface soil SORs were calculated for the radionuclides of concern (americium-241, plutonium-239/240, and uranium-233/234, -235 and -238). Only surface soil SORs were calculated for the non-radionuclides of concern (metals and VOCs excluding arsenic, aluminum, iron, manganese, and the polynuclear aromatic hydrocarbons). Subsurface soil concentrations are evaluated as part of the SSRS in Section 6.0.

SORs for radionuclides were calculated for all locations with analytical results greater than background means plus two standard deviations. SORs for radionuclides are presented in Table 4. As shown, all SORs for radionuclides in surface and subsurface soil are less than 1. SORs for non-radionuclides were calculated for all locations where analyte concentrations were detected at 10 percent or more of a contaminant's WRW AL. SORs for non-radionuclides are presented in Table 5. As shown, all SORs for non-radionuclides in surface soil are less than 1.

Table 4
RFCAs Sums of Ratios Based on Radionuclide Concentrations

Location Code	Start Depth (ft)	End Depth (ft)	Radionuclide Surface Soil SOR	Radionuclide Subsurface Soil SOR
CJ43-000	0 0	0 5	0 069	N/A
CJ43-000	0 5	1 5	N/A	0 048
CL43-004	1 4	1 9	N/A	0 061
CL43-004	1 9	3 9	N/A	0 041
CM42-001	0 4	0 9	N/A	0 024
CM42-001	0 9	1 7	N/A	0 005
CM42-004	0 5	1 0	N/A	0 032
CM42-004	1 0	2 0	N/A	0 017
CM42-005	0 0	0 5	0 056	N/A
CM42-005	0 5	2 5	N/A	0 055
CM42-007	0 0	0 5	0 062	N/A
CM42-007	0 5	2 5	N/A	0 049
CM42-008	0 0	0 5	0 044	N/A
CM42-008	0 5	2 5	N/A	0 043
CM42-009	0 0	0 5	0 039	N/A
CM42-009	0 5	2 5	N/A	0 055
CM42-010	2 5	4 5	N/A	0 050
CM42-011	2 5	4 5	N/A	0 023
CM42-013	2 5	4 5	N/A	0 051
CM43-000	2 5	4 5	N/A	0 040
CM43-001	0 6	1 1	N/A	0 059
CM43-001	1 1	2 6	N/A	0 051
CM43-002	0 8	1 3	N/A	0 027
CM43-002	1 3	2 3	N/A	0 050
CN42-005	0 5	1 0	N/A	0 050
CN42-005	1 0	1 5	N/A	0 064
CN42-007	1 2	1 7	N/A	0 022
CN42-015	0 5	1 0	N/A	0 061
CN42-015	1 0	1 5	N/A	0 064
CN42-017	1 0	2 0	N/A	0 025
CN42-020	0 0	0 5	0 043	N/A
CN42-020	0 5	2 5	N/A	0 047
CN42-021	0 0	0 5	0 053	N/A
CN42-021	0 5	2 5	N/A	0 041
CN42-022	0 0	0 5	0 037	N/A
CN42-022	0 5	2 5	N/A	0 036
CN42-023	0 5	2 5	N/A	0 039
CN42-024	2 5	4 5	N/A	0 059
CN43-000	0 0	0 5	0 056	N/A
CN43-000	0 5	1 0	N/A	0 037
CN43-002	0 5	1 0	N/A	0 060
CN43-002	1 0	1 5	N/A	0 069
CN43-003	1 3	1 8	N/A	0 028

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Location Code	Start Depth (ft)	End Depth (ft)	Radionuclide Surface Soil SOR	Radionuclide Subsurface Soil SOR
CN43-003	1 8	2 3	N/A	0 006
CN44-001	0 5	1 0	N/A	0 026
CO42-000	0 5	1 0	N/A	0 023
CO42-000	1 0	1 5	N/A	0 067
CO42-001	1 0	1 5	N/A	0 007
CO42-006	0 5	1 0	N/A	0 029
CO42-007	2 5	4 5	N/A	0 049
CO42-008	2 5	4 5	N/A	0 050
CO43-001	2 5	4 5	N/A	0 075
CQ42-002	0 0	0 5	0 064	N/A
CQ42-003	0 0	0 5	0 055	N/A
CQ42-004	0 0	0 5	0 045	N/A
CQ42-005	0 0	0 5	0 062	N/A
CQ42-006	0 0	0 5	0 056	N/A
CQ42-007	0 0	0 5	0 054	N/A
CQ42-008	8 0	9 0	N/A	0 059
CQ43-001	0 0	0 5	0 021	N/A
CQ43-002	0 0	0 5	0 056	N/A
CQ43-003	0 0	0 5	0 056	N/A
CQ43-004	0 0	0 5	0 027	N/A

**Table 5
Non-Radionuclide Surface Soil Sums of Ratios**

Location Code	Sum of Ratio to WRW
CM42-007	0 176
CN42-021	0 345
CN42-022	0 170
CQ42-002	0 115
CQ42-003	0 143
CQ42-005	0 131
CQ42-006	0 143
CQ42-007	0 166
CQ43-001	0 124
CQ43-002	0 351
CQ43-003	0 142
CQ43-004	0 168

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3.0 ACCELERATED ACTION

Remedial action objectives were developed and described in ER RSOP Notification #03-05 (DOE 2003c) ER RSOP remedial action objectives include the following

- Provide a remedy consistent with the RFETS goal of protection of human health and the environment,
 - Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls, and
 - Minimize the spread of contaminants during implementation of accelerated actions
- The accelerated action remediation goals for IHSS Group 900-1 included the following

- Remove the Building 993 slab and pit,
- Remove any other remaining Building 993 utilities and components within 3 feet of current grade,
- Remove soil with contaminant concentrations greater than RFCA ALs in accordance with the ER RSOP (DOE 2003b),
- Remove soil with contaminant concentrations less than RFCA ALs if indicated through the SSRS and stewardship evaluations and the consultative process, and
- Collect confirmation samples in accordance with the IASAP (DOE 2001)

The IHSS Group 900-1 accelerated action did not include removal of Building 991 and the associated tunnels and vaults (991 Tunnel, Tunnel 996, Tunnel 998, and Buildings 996, 997, 998 and 999) Removal of Building 991 and its utilities will be conducted by Remediation and Industrial Site Services (RISS) as a Decontamination and Decommissioning (D&D) project The vaults and most of the tunnels will be left in place Refer to Section 7.1

Accelerated action activities, including characterization, were conducted between January 30, 2003 and January 19, 2004 Start and end dates of significant activities are listed in Table 6 Photographs of site activities are provided in Appendix B

**Table 6
Dates of Accelerated Action Activities**

Activity	Start Date	End Date	Duration
Building 993 Removal Activities	January 30, 2003	February 8, 2003	8 days
Characterization Sampling at Buildings 991 and 993	February 4, 2003	January 19, 2004	17 days
Backfilling Building 993 Excavation	February 17, 2003	February 17, 2003	1 days
Reseeding Building 993 Area	March 17, 2003	March 17, 2003	1 day

3.1 Removal Activities

All accelerated action objectives were achieved Removal activities are described below

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3.1.1 Building Slab and Pit

The Building 993 slab (approximately 30 x 40 feet) was removed, as well as the explosive bonding pit/tank (approximately 10 feet in diameter and 7 feet deep) and the concrete foundation (slab) under the tank. An excavator was used to remove items, including the fill material (road base/gravel) in the tank. The tank was also size-reduced. Because the building never possessed any waste lines or drains, none was removed. Other utilities, such as electrical lines, were removed when the building was demolished. The building slab was disposed of off site as sanitary waste. The tank and associated slab were placed in one waste container, foamed, and disposed of off site as low-level radioactive waste (LLW). Groundwater encountered during the removal of the tank was pumped into four 55-gallon drums and shipped to the Building 995 sanitary wastewater treatment facility. The road base/gravel was used as backfill material after it was sampled and concentrations were determined to be less than ALs (refer to Regulatory Contact Record dated February 6, 2004, in Appendix A). The area was then re-graded and seeded.

4.0 CONFIRMATION SAMPLING

Based on characterization results (Section 2.7) and the SSRS (Section 6.0), soil removal was not necessary, therefore, no confirmation samples were collected.

5.0 RCRA UNIT CLOSURE

Building 993 was listed on the Master List of RCRA Units as a Permitted Area. The area was closed in accordance with Colorado Hazardous Waste Act (CHWA) closure requirements prior to building demolition (K-H 2003).

Hazardous/Mixed Waste Container Storage Unit 991.1 was located in Buildings 991 and 998 and Corridor A, which connects the two buildings. This RCRA unit was closed in accordance with CHWA requirements and the RSOP for Facility Component Removal, Size Reduction and Decontamination Activities (DOE 2003d), and closure will be documented in a separate closure document.

6.0 SUBSURFACE SOIL RISK SCREEN

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

Screen 1 – Are the contaminant of concern (COC) concentrations below RFCA Table 3 Soil ALs for the WRW?

All subsurface COC concentrations are less than the WRW ALs, except for two subsurface arsenic concentrations. The elevated arsenic concentrations in subsurface soil were 25.1 and 40 mg/kg (at Sampling Locations CN42-020 and CN44-001, respectively). The 40 mg/kg concentration was detected at a depth of over 20 feet below ground surface, beneath the Building 998 vault.

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

The southeastern portion of IHSS Group 900-1 is in an area of potential erosion (Figure 1 of the RFCA Modification (DOE et al 2003) However, all contaminant concentrations in this area are below the WRW ALs

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

No There are no OPWL located within IHSS Group 900-1

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

Contaminant migration via erosion and groundwater are two possible pathways whereby surface water could become contaminated from IHSS Group 900-1 soil. Runoff from the IHSS Group flows to South Walnut Creek through gauging station (GS)-10, which is the nearest RFCA surface water Point of Evaluation (DOE 2003e). Elevated activities of plutonium-239/240 and americium-241 have been detected at GS-10, however, GS-10 receives water from a large part of the IA, and surface water quality at GS-10 cannot be attributable to any single IHSS Group. In addition, characterization results indicate that soil within IHSS Group 900-1 does not contain plutonium-239/240 and americium-241 activities above background means plus two standard deviations. However, IHSS Group 900-1 could contribute to the contamination detected in surface water.

Evaluations of potential sources of contamination detected in surface water sampled at GS-10 have been conducted and will continue under the ER and Integrated Monitoring Programs. Results from soil and sediment characterization of IHSS Group 900-1 will be used as part of the ongoing source evaluation. In addition, soil adjacent to IHSS Group 900-1 will be further characterized by the ER Program in the future, and results will be used in source evaluation.

Four groundwater monitoring wells are situated around Building 991 (99101, 99201, 99301 and 99401), and uranium-234 and uranium-238 activities in two of the wells (99101 and 99401) have reported values above RFCA Tier I groundwater ALs over the last two years. Uranium-235, arsenic, selenium, thallium, and trichloroethene also have been detected above Tier II groundwater ALs in one or more of the four wells. The two wells with elevated activities are downgradient of Building 991, and the two other wells without elevated activities are upgradient of Building 991, indicating that Building 991 may have been a source of contamination. In addition, high VOC concentrations (less than the WRW ALs) were detected in subsurface soil within IHSS 900-184 (Figure 2). Therefore, the Building 991 area, along with other portions of the IA, could contribute to groundwater contamination in the area. Groundwater monitoring in the area will continue under the Integrated Monitoring Program. Groundwater contamination in the area and the need for remediation (for example, groundwater treatment system) will be evaluated in the Groundwater Interim Measure/Interim Remedial Action decision document.

Screen 5 – Are COC concentrations below RFCA Table 3 Soil ALs for ecological receptors?

No There were four subsurface soil exceedances of ecological receptor ALs two arsenic concentrations and two lead concentrations (Section 2.7 and Table 3) The potential ecological risk associated with arsenic and lead concentrations in soil greater than the ecological receptor ALs will be evaluated in the AAESE and the ecological portion of the Sitewide CRA

7.0 STEWARDSHIP ANALYSIS

The IHSS Group 900-1 stewardship evaluation was conducted through ongoing consultation with the regulatory agencies Frequent informal project updates, e-mails, and telephone and personal contact occurred throughout the project Documentation associated with these contacts is included in Appendix A

7.1 Current Site Conditions

Accelerated actions at IHSS Group 900-1 consisted of soil characterization and excavation of the Building 993 slab, the explosive bonding pit, and the concrete slab beneath the pit Based on the accelerated action, the following conditions exist at IHSS Group 900-1

- Potential sources of soil contamination that existed in IHSS Group 900-1 (i.e., the Building 993 slab, explosive bonding pit, and concrete slab beneath the pit) were removed
- Building 991 is currently being demolished Associated tunnels and vaults remain
- Surface and subsurface contaminant concentrations in soil are greater than background means plus two standard deviations or reporting limits throughout the IHSS Group
- All contaminant concentrations are less than RFCA WRW ALs, except for one surface and two subsurface arsenic concentrations The elevated arsenic concentration in surface soil was 25.2 mg/kg, and the AL is 22.2 mg/kg The elevated arsenic concentrations in subsurface soil were 25.1 and 40 mg/kg
- The elevated arsenic concentrations also exceeded the ecological receptor AL, which is 21.6 mg/kg In addition, twelve lead concentrations in surface soil, two lead concentrations in subsurface soil, three lead concentrations in sediment, and one beryllium concentration in sediment exceeded ecological receptor ALs Lead concentrations ranged from 27.1 to 241 mg/kg, and the AL is 25.6 mg/kg The beryllium concentration was 3.5 mg/kg, and the AL is 2.15 mg/kg
- The Building 993 area was re-graded and re-vegetated

Building 991 is being demolished and the building slab will be removed under the RISS D&D Program in accordance with the RFCA RSOP for Facility Disposition (DOE 2000b) Based on characterization results, the three associated tunnels (991 Tunnel,

Tunnel 996 and Tunnel 998) and vaults (Buildings 996, 997, 998 and 999) do not require any further accelerated action. On August 21, 2003, CDPHE concurred with DOE's recommendation for no further accelerated action (NFAA) at 991 Tunnel and Buildings 996, 997 and 999 (S H Gunderson, letter, to R DiSalvo, 2003). The vaults and most of the tunnels will be left in place. After the building has been demolished and the slab has been removed, any excavations will be backfilled and the site will be re-graded as necessary to minimize erosion and prevent any large-scale ponding of precipitation. All D&D activities will be documented in a separate project closeout report. Later, additional backfill will be brought in and the site will be graded as necessary to conform to the Site's land configuration plan.

The foam fire that occurred within Building 991 (in the western side of Corridor B from February 12 to February 19, 2004) did not adversely impact soil within the IHSS Group. The only element of the fire that could have affected the soil was the water used to contain the fire. This water was diverted across the asphalt south of the Building 991 southern dock into the storm sewer. Berms were used outside the building to contain the water and prevent it from contacting area soil. The water was then diverted into South Walnut Creek and into Pond B-1. Fire water from the area of combustion was sampled, as well as water in South Walnut Creek during the diversion and water in Pond B-1 after the application of water to Building 991 ceased. Water from the area of combustion contained detected levels of constituents expected (styrene, toluene, benzene, chlorinated hydrocarbons, and cyanide). There were no detections of organic compounds in South Walnut Creek or Pond B-1. Elevated concentrations of cyanide were detected in South Walnut Creek and Pond B-1, however, concentrations were less than the surface water quality standard for cyanide. Based on these results, even if some fire water were to have migrated below the building slab through floor cracks and joints, contaminant concentrations in subsurface soil are expected to remain below RFCA soil ALs, and therefore, additional soil samples were not collected. Soil ALs for the constituents of concern are considerably greater than the concentrations detected in the water from the combustion area. For example, the water from the combustion area contained 8,540 ug/L of cyanide (approximately 8.5 parts per million), and the WRW AL for cyanide in soil is 20,400 mg/kg (approximately 20,000 parts per million). Details on the containment of the fire water and impacts on surface water quality are presented in Appendix C, Assessment of the Building 991 Fire on Surface Water Quality.

7.2 Near-Term Management Recommendations

No IHSS Group-specific near-term management techniques are required, except the backfilling and re-grading to minimize erosion and prevent large-scale ponding. Potential sources of soil contamination that existed in IHSS Group 900-1 (i.e., the Building 993 slab, explosive bonding pit, and concrete slab beneath the pit) were removed. Contaminant concentrations in soil remaining at IHSS Group 900-1 do not trigger any further accelerated action. Near-term recommendations include the following:

- Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process,
- Access will be restricted to minimize disturbance to newly revegetated areas, and

- Site access and security controls and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls

However, because contaminant concentrations in groundwater and surface water exceed background concentrations downgradient from Building 991, surface water and groundwater in the area will continue to be monitored under the Integrated Monitoring Program

7.3 Long-Term Stewardship Recommendation

Based on remaining environmental conditions at IHSS Group 900-1, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements. These requirements may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include the following:

- Prohibitions on construction of buildings in the IA,
- Restrictions on excavation or other soil disturbance, and
- Prohibitions on groundwater pumping in the area of IHSS Group 900-1

No specific engineered controls or environmental monitoring are recommended as a result of the conditions remaining at IHSS Group 900-1. Likewise, no specific institutional or physical controls are recommended as a result of the conditions remaining at IHSS Group 900-1. However, surface water and groundwater in the area will continue to be monitored under the Integrated Monitoring Program.

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

IHSS Group 900-1 will be evaluated as part of the Sitewide CRA, which is part of the Remedial Investigation/Feasibility Study (RI/FS) that will be conducted for the Site. The need for and extent of any, more general, long-term stewardship activities will also be evaluated in the RI/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the Corrective Action Decision/Record of Decision, any post-closure CHWA permit that may be required, and any post-RFCA agreement.

8.0 DEVIATIONS FROM THE ER RSOP

Removal methods and objectives did not deviate from the ER RSOP or Notification #03-05.

9.0 POST-REMEDATION CONDITIONS

The Building 993 slab, explosive bonding pit, and slab beneath the pit were removed. Building 991 and associated tunnels and vaults currently remain. Surface and subsurface

soil sampling results indicate that all contaminant concentrations are less than the RFCA WRW ALs, except for one surface and two subsurface arsenic concentrations. The elevated arsenic concentration in surface soil was 25.2 mg/kg, and the AL is 22.2 mg/kg. The elevated arsenic concentrations in subsurface soil were 25.1 and 40 mg/kg. The elevated arsenic concentrations also exceeded the ecological receptor AL, which is 21.6 mg/kg. In addition, twelve lead concentrations in surface soil, two lead concentrations in subsurface soil, three lead concentrations in sediment, and one beryllium concentration in sediment exceeded ecological receptor ALs. Lead concentrations ranged from 27.1 to 241 mg/kg, and the AL is 25.6 mg/kg. The beryllium concentration was 3.5 mg/kg, and the AL is 2.15 mg/kg. Residual surface soil, subsurface soil, and sediment concentrations greater than background means plus two standard deviations or RLs are shown on Figures 2, 3 and 4.

SORs, based on the RFCA WRW ALs for COCs and accelerated action data, are listed in Tables 4 and 5 (Section 2.8). All SORs for radionuclides in surface and subsurface soil were less than 1, and all SORs for non-radionuclides in surface soil were less than 1.

10.0 WASTE MANAGEMENT

Waste from the IHSS Group 900-1 accelerated action consisted of the Building 993 concrete slab, explosive bonding steel tank, and concrete slab beneath the tank. The building slab was disposed of off site as sanitary waste (63 cubic yards). The tank and associated slab were placed in one waste container, foamed, and disposed of off site as LLW (44 cubic yards). The tank was sized-reduced prior to placement in the waste container. Groundwater encountered during removal of the pit/tank was pumped into four 55-gallon drums and shipped to the Building 995 sanitary wastewater treatment facility.

11.0 SITE RECLAMATION

The road base/gravel removed from the explosive bonding pit was used to backfill the pit excavation after the material was sampled and all potential contaminant concentrations were found to be less than ALs. The Building 993 area was then regraded and seeded.

12.0 NO LONGER REPRESENTATIVE SAMPLING LOCATIONS

There are no sampling locations that are No Longer Representative. Because no excavation was conducted around Building 991, no sampling locations in the area were disturbed. Sampling around Building 993 occurred after the Building 993 slab, explosive bonding pit and associated pad had been removed, and therefore, no sampling locations in the area were disturbed. The area around the Building 993 area was regraded, however, the sampling locations were not significantly impacted. Therefore, data from all of the sampling locations are still representative.

13.0 DATA QUALITY ASSESSMENT

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

- Regulatory agency-approved sampling program design (IASAP Addendum #IA-03-03 [DOE 2003a]), modified, due to field conditions, in accordance with the IASAP (DOE 2001),
- Collection of samples in accordance with the sampling design, and
- Results of the DQA, as described in the following sections

13.1 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

- U S Environmental Protection Agency (EPA), 1994a, Guidance for the Data Quality Objective Process, QA/G-4,
- EPA, 1998, Guidance for the Data Quality Assessment Process, Practical Methods for Data Analysis, QA/G-9, and
- DOE Order 414 1A, 1999, Quality Assurance

Verification and validation (V&V) of data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions, uncertainty within the decisions, and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines

- EPA, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012,
- EPA, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013,
- K-H, 2002a, General Guidelines for Data Verification and Validation, DA-GR01-v2, October,
- K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, October,
- K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v3, October,
- K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v3, October,
- K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v3, October, and
- 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 AR for permanent storage 30 days after being provided to CDPHE and/or EPA

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

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (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 hard-copy data (for example, individual analytical data packages) are currently filed by report identification number and maintained by Kaiser-Hill Company, L L C (K-H) Analytical Services Division (ASD). Older hard copies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS SWD.

Both real (normalized) and quality control (QC) data are included on the enclosed compact disc.

13.2.1 Accuracy

The following measures of accuracy were reviewed:

- LCS evaluation,
- Surrogate evaluation,
- Field blank evaluation, and
- Sample MS 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 QC results could indicate unacceptable levels of uncertainty for decision-making purposes

Laboratory Control Sample Evaluation

The frequency of LCS measurements, relative to each laboratory batch, is given in Table 7 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 LCS results that were outside of tolerances were reviewed to determine whether a potential bias might be indicated LCS recoveries are not indicative of matrix effects because they were not prepared using site samples LCS results do indicate whether the laboratory may be introducing a bias in the results Recoveries reported above the upper limit may indicate the actual sample results are less than reported Because this is environmentally conservative, no further action is needed The analytes with unacceptable low recoveries were evaluated If the highest sample result less than the AL, divided by the lowest LCS recovery for that analyte, is less than the AL, no further action is taken because any indicated bias is not great enough to make a falsely low sample result be above the AL As a result of these analyses, the LCS recoveries for this project did not impact project decisions Any qualifications of individual results due to LCS performance exceeding upper or lower tolerance limits are captured in the V&V flags, described in Section 13 2 3

**Table 7
LCS Evaluation Summary**

Test Method	CAS No.	Analyte	Min Result	Max Result	Result Unit	No. of Analytes	No. of Batches
SW-846 8260	71-55-6	1,1,1-Trichloroethane	85	106 1	%REC	17	17
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	86	104 6	%REC	17	17
SW-846 8260	79-00-5	1,1,2-Trichloroethane	88 32	101 6	%REC	17	17
SW-846 8260	75-34-3	1,1-Dichloroethane	80 89	111 5	%REC	17	17
SW-846 8260	75-35-4	1,1-Dichloroethene	81	132 6	%REC	17	17
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	85 48	120 5	%REC	17	17
SW-846 8260	95-50-1	1,2-Dichlorobenzene	92 2	111 2	%REC	17	17
SW-846 8260	107-06-2	1,2-Dichloroethane	78 75	103 1	%REC	17	17
SW-846 8260	78-87-5	1,2-Dichloropropane	87	114 9	%REC	17	17
SW-846 8260	106-46-7	1,4-Dichlorobenzene	90 79	109 2	%REC	17	17
SW-846 8330	121-14-2	2,4-Dinitrotoluene	111	116	%REC	2	2
SW-846 8330	606-20-2	2,6-Dinitrotoluene	113	118	%REC	2	2
SW-846 8260	78-93-3	2-Butanone	35 97	98 17	%REC	17	17
SW-846 8260	108-10-1	4-Methyl-2-pentanone	75 85	122 3	%REC	17	17
SW-846 8260	67-64-1	Acetone	27 36	104	%REC	17	17
SW-846 6010	7429-90-5	Aluminum	87	104	%REC	11	10
SW-846 6010	7440-36-0	Antimony	89	100	%REC	11	10
SW-846 6010	7440-38-2	Arsenic	90	99	%REC	11	10
SW-846 6010	7440-39-3	Barium	94	107	%REC	11	10
SW-846 8260	71-43-2	Benzene	84 83	110 3	%REC	17	17

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Test Method	CAS No.	Analyte	Min Result	Max Result	Result Unit	No. of Analytes	No. of Batches
SW-846 6010	7440-41-7	Beryllium	93	105	%REC	11	10
SW-846 8260	75-27-4	Bromodichloromethane	83 26	103 7	%REC	17	17
SW-846 8260	75-25-2	Bromoform	93	113 5	%REC	17	17
SW-846 8260	74-83-9	Bromomethane	56 32	139	%REC	17	17
SW-846 6010	7440-43-9	Cadmium	91	102	%REC	11	10
SW-846 8260	75-15-0	Carbon Disulfide	70	160	%REC	17	17
SW-846 8260	56-23-5	Carbon Tetrachloride	82 6	108 3	%REC	17	17
SW-846 8260	108-90-7	Chlorobenzene	93 28	107 8	%REC	17	17
SW-846 8260	75-00-3	Chloroethane	73 9	133 8	%REC	17	17
SW-846 8260	67-66-3	Chloroform	82 26	104 3	%REC	17	17
SW-846 8260	74-87-3	Chloromethane	55	228 9	%REC	17	17
SW-846 6010	7440-47-3	Chromium	92	104	%REC	11	10
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	75 39	107 3	%REC	17	17
SW-846 6010	7440-48-4	Cobalt	89	101	%REC	11	10
SW-846 6010	7440-50-8	Copper	90	101	%REC	11	10
SW-846 8260	124-48-1	Dibromochloromethane	94	108 3	%REC	17	17
SW-846 8260	100-41-4	Ethylbenzene	91 76	109 3	%REC	17	17
SW-846 8260	87-68-3	Hexachlorobutadiene	81 29	115 7	%REC	17	17
SW-846 6010	7439-89-6	Iron	93	106	%REC	11	10
SW-846 6010	7439-92-1	Lead	91	102	%REC	11	10
SW-846 6010	7439-93-2	Lithium	90	98	%REC	11	10
SW-846 6010	7439-96-5	Manganese	91	101	%REC	11	10
SW-846 6010	7439-97-6	Mercury	94	104	%REC	12	11
SW-846 8260	75-09-2	Methylene chloride	83 28	136	%REC	17	17
SW-846 6010	7439-98-7	Molybdenum	87	100	%REC	11	10
SW-846 8260	91-20-3	Naphthalene	88 11	131 4	%REC	17	17
SW-846 6010	7440-02-0	Nickel	91	101	%REC	11	10
SW846 8330	98-95-3	Nitrobenzene	117	121	%REC	2	2
SW-846 6010	7782-49-2	Selenium	88	101	%REC	11	10
SW-846 6010	7440-22-4	Silver	91	99	%REC	11	10
SW-846 6010	7440-24-6	Strontium	94	105	%REC	11	10
SW-846 8260	100-42-5	Styrene	91 64	116	%REC	17	17
SW-846 8260	127-18-4	Tetrachloroethene	91	108 9	%REC	17	17
SW-846 6010	7440-31-5	Tin	88	99	%REC	11	10
SW-846 8260	108-88-3	Toluene	88	100 6	%REC	17	17
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	91 58	107 5	%REC	17	17
SW-846 8260	79-01-6	Trichloroethene	84 9	103 9	%REC	17	17
SW-846 6010	11-09-7	Uranium, Total	96	107	%REC	11	10
SW-846 6010	7440-62-2	Vanadium	91	104	%REC	11	10
SW-846 8260	75-01-4	Vinyl chloride	66	205 4	%REC	17	17
SW-846 8260	1330-20-7	Xylene	88 03	111	%REC	17	17
SW-846 6010	7440-66-6	Zinc	90	99	%REC	11	10

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Surrogate Evaluation

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 8. Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project. Surrogates are added to every sample, and therefore, surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential matrix effects. The highest and lowest surrogate recoveries for this project were reviewed and the associated sample results were not close enough to the ALs to indicate project decisions would be impacted. Any qualifications of the data due to surrogate results are captured in the V&V flags, described in Section 13.2.3.

**Table 8
Surrogate Recovery Summary**

VOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum Concentration	Maximum Concentration	Unit
49	1,2-Dichloroethane -d4	88	124.4	%REC
49	Bromofluorobenzene	90.31	139.2	%REC
49	Toluene - d8	86.27	116.6	%REC

Field Blank Evaluation

Results of the field blank analyses are given in Table 9. 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 five times the result for non-laboratory contaminants, the real result is eliminated. None of the chemicals was detected in the blanks at concentrations greater than one-tenth the AL. Therefore, no sample results at or above the ALs could have been impacted by the blanks.

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 MS results are summarized by chemical for the entire project in Table 10. Organic analytes with unacceptable low recoveries resulted in a review of the LCS recoveries. According to the EPA data validation guidelines (EPA 1994b), if organic matrix spike recoveries are low, the LCS recovery is to be checked and, if acceptable, no action is to be taken. For this project, these checks indicate no decisions were impacted for organic analytes. For inorganics, the associated sample results were divided by the lowest percent recovery for each analyte. If the resulting number is less than the AL, decisions were not impacted, and no action was taken. For this project, all results were acceptable. Manganese had a low recovery (9.4 percent), and aluminum and iron had 0 percent recoveries as lows. However, for these analytes, the ALs were at least a factor of three times higher than the highest sample results. Therefore, no decisions were impacted.

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Table 9
Field Blank Summary

Test Method	CAS No.	Analyte	Sample QC Code	Max Result	Result Unit	Lab Results Qualifier Code
SW-846 8260	67-64-1	Acetone	FB	30	ug/L	J
SW-846 8260	67-64-1	Acetone	FB	9 9	ug/L	JB
SW-846 8260	67-64-1	Acetone	RNS	30	ug/L	J
SW-846 8260	67-64-1	Acetone	RNS	10	ug/L	JB
SW-846 8260	67-64-1	Acetone	TB	30	ug/L	J
SW-846 8260	67-64-1	Acetone	TB	17	ug/L	JB
SW8260B	67-64-1	Acetone	FB	9 9	ug/L	BJ
SW8260B	67-64-1	Acetone	FB	30	ug/L	J
SW8260B	67-64-1	Acetone	TB	17	ug/L	BJ
SW8260B	67-64-1	Acetone	TB	30	ug/L	J
SW-846 6010	7429-90-5	Aluminum	RNS	0 033	mg/L	B
SW-846 6010	7440-39-3	Barium	RNS	0 0086	mg/L	B
SW-846 8260	71-43-2	Benzene	TB	1	ug/L	J
SW8260B	71-43-2	Benzene	TB	1	ug/L	J
SW-846 6010	7440-41-7	Beryllium	RNS	0 00049	mg/L	B
SW-846 8260	75-15-0	Carbon Disulfide	TB	0 27	ug/L	J
SW-846 6010	7439-89-6	Iron	RNS	0 029	mg/L	B
SW-846 6010	7439-92-1	Lead	RNS	0 002	mg/L	B
SW-846 6010	7439-96-5	Manganese	RNS	0 001	mg/L	B
SW-846 8260	91-20-3	Naphthalene	RNS	0 8	ug/L	J
SW-846 8260	91-20-3	Naphthalene	TB	0 8	ug/L	J
SW8260B	91-20-3	Naphthalene	TB	0 8	ug/L	J
SW-846 6010	7440-24-6	Strontium	RNS	0 0008	mg/L	B
SW8260B	108-88-3	Toluene	TB	1 7	ug/L	BJ
SW8260B	108-88-3	Toluene	TB	4 2	ug/L	J
SW-846 8260	108-88-3	Toluene	TB	4 2	ug/L	J
SW-846 8260	108-88-3	Toluene	TB	1 7	ug/L	JB
Gamma Spectroscopy	15117-96-1	Uranium-235	RNS	0 14	PCI/G-WET	-
Gamma Spectroscopy	7440-61-1	Uranium-238	RNS	2 7	PCI/G-WET	-
SW-846 6010	7440-66-6	Zinc	RNS	0 019	mg/L	B

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

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Table 10
Sample MS Evaluation Summary

Test Method	CAS No	Analyte	Min Result	Max Result	Result Unit	No of Samples	No of Lab Batches
SW-846 8260	71-55-6	1,1,1-Trichloroethane	62 63	110 7	%REC	12	12
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	0	97	%REC	12	12
SW-846 8260	79-00-5	1,1,2-Trichloroethane	61 56	102 9	%REC	12	12
SW-846 8260	75-34-3	1,1-Dichloroethane	81 73	113	%REC	12	12
SW-846 8260	75-35-4	1,1-Dichloroethene	65 62	103 4	%REC	12	12
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	7 058	98 78	%REC	12	12
SW-846 8260	95-50-1	1,2-Dichlorobenzene	16 5	99 61	%REC	12	12
SW-846 8260	107-06-2	1,2-Dichloroethane	85 4	110 4	%REC	12	12
SW-846 8260	78-87-5	1,2-Dichloropropane	67 35	104 5	%REC	12	12
SW-846 8260	106-46-7	1,4-Dichlorobenzene	17 73	98 97	%REC	12	12
SW846 8330	121-14-2	2,4-Dinitrotoluene	115	119	%REC	2	2
SW846 8330	606-20-2	2,6-Dinitrotoluene	118	127	%REC	2	2
SW-846 8260	78-93-3	2-Butanone	69	228 9	%REC	12	12
SW-846 8260	108-10-1	4-Methyl-2-pentanone	72 77	123 6	%REC	12	12
SW-846 8260	67-64-1	Acetone	49	284 4	%REC	12	12
SW-846 6010	7429-90-5	Aluminum	0	12700	%REC	10	10
SW-846 6010	7440-36-0	Antimony	34	72	%REC	10	10
SW-846 6010	7440-38-2	Arsenic	81	94	%REC	10	10
SW-846 6010	7440-39-3	Barium	85	109	%REC	10	10
SW-846 8260	71-43-2	Benzene	69 37	105 6	%REC	12	12
SW-846 6010	7440-41-7	Beryllium	84	114	%REC	10	10
SW-846 8260	75-27-4	Bromodichloromethane	58 08	106 6	%REC	12	12
SW-846 8260	75-25-2	Bromoform	40 9	105	%REC	12	12
SW-846 8260	74-83-9	Bromomethane	64 35	138 3	%REC	12	12
SW-846 6010	7440-43-9	Cadmium	71	93	%REC	10	10
SW-846 8260	75-15-0	Carbon Disulfide	58 15	106 2	%REC	12	12
SW-846 8260	56-23-5	Carbon Tetrachloride	57 56	107 1	%REC	12	12
SW-846 8260	108-90-7	Chlorobenzene	40 35	100 4	%REC	12	12
SW-846 8260	75-00-3	Chloroethane	63 48	113 9	%REC	12	12
SW-846 8260	67-66-3	Chloroform	75 9	108 4	%REC	12	12
SW-846 8260	74-87-3	Chloromethane	50 46	124 2	%REC	12	12
SW-846 6010	7440-47-3	Chromium	93	172	%REC	10	10
SW-846 8260	10061-01-5	cis-1 3-Dichloropropene	71 29	104 2	%REC	12	12
SW-846 6010	7440-48-4	Cobalt	77	96	%REC	10	10
SW-846 6010	7440-50-8	Copper	62	110	%REC	10	10
SW-846 8260	124-48-1	Dibromochloromethane	44 69	104	%REC	12	12
SW-846 8260	100-41-4	Ethylbenzene	36 5	98 63	%REC	12	12
SW-846 8260	87-68-3	Hexachlorobutadiene	3 558	94 17	%REC	12	12
SW-846 6010	7439-89-6	Iron	0	3300	%REC	10	10
SW-846 6010	7439-92-1	Lead	81	97	%REC	10	10
SW-846 6010	7439-93-2	Lithium	81	113	%REC	10	10
SW-846 6010	7439-96-5	Manganese	9 4	164	%REC	10	10

Test Method	CAS No.	Analyte	Min Result	Max Result	Result Unit	No. of Samples	No. of Lab Batches
SW-846 6010	7439-97-6	Mercury	12	104	%REC	11	11
SW-846 8260	75-09-2	Methylene chloride	75.9	98.44	%REC	12	12
SW-846 6010	7439-98-7	Molybdenum	80	93	%REC	10	10
SW-846 8260	91-20-3	Naphthalene	7.808	105.9	%REC	12	12
SW-846 6010	7440-02-0	Nickel	82	101	%REC	10	10
SW846 8330	98-95-3	Nitrobenzene	119	121	%REC	2	2
SW-846 6010	7782-49-2	Selenium	81	96	%REC	10	10
SW-846 6010	7440-22-4	Silver	86	95	%REC	10	10
SW-846 6010	7440-24-6	Strontium	88	115	%REC	10	10
SW-846 8260	100-42-5	Styrene	19.78	102	%REC	12	12
SW-846 8260	127-18-4	Tetrachloroethene	34.65	98.18	%REC	12	12
SW-846 6010	7440-31-5	Tin	78	91	%REC	10	10
SW-846 8260	108-88-3	Toluene	43.75	103.7	%REC	12	12
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	53.13	103	%REC	12	12
SW-846 8260	79-01-6	Trichloroethene	52.73	190.2	%REC	12	12
SW-846 6010	11-09-7	Uranium, Total	86	98	%REC	10	10
SW-846 6010	7440-62-2	Vanadium	85	154	%REC	10	10
SW-846 8260	75-01-4	Vinyl chloride	48.27	107.8	%REC	12	12
SW-846 8260	1330-20-7	Xylene	29.6	100	%REC	12	12
SW-846 6010	7440-66-6	Zinc	71	101	%REC	10	10

13.2.2 Precision

Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSDs. Adequate frequency of MSD measurements is indicated by at least one MSD in each laboratory batch. Table 11 indicates that MSD frequencies were adequate. The analytes with the highest relative percent differences (RPDs) were reviewed by comparing the highest sample result to the AL. If the highest results were sufficiently less than the ALs, no further action is needed. For this project, the reviews indicated decisions were not impacted. While some of the RPDs appear to be high, they would not result in rejection of data that affects project decisions.

Table 11
Sample MSD Evaluation Summary

Test Method	CAS No.	Analyte	No. of Sample Pairs	No. of Lab Batches	Max RPD
SW-846 8260	71-55-6	1,1,1-Trichloroethane	12	12	8.56
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	11	11	88.84
SW-846 8260	79-00-5	1,1,2-Trichloroethane	12	12	9.80
SW-846 8260	75-34-3	1,1-Dichloroethane	12	12	11.93
SW-846 8260	75-35-4	1,1-Dichloroethene	12	12	7.99
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	12	12	18.62
SW-846 8260	95-50-1	1,2-Dichlorobenzene	12	12	19.11
SW-846 8260	107-06-2	1,2-Dichloroethane	12	12	7.93

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Test Method	CAS No.	Analyte	No. of Sample Pairs	No. of Lab Batches	Max RPD
SW-846 8260	78-87-5	1,2-Dichloropropane	12	12	14 68
SW-846 8260	106-46-7	1,4-Dichlorobenzene	12	12	17 39
SW846 8330	121-14-2	2,4-Dinitrotoluene	2	2	1 72
SW846 8330	606-20-2	2,6-Dinitrotoluene	2	2	4 62
SW-846 8260	78-93-3	2-Butanone	12	12	22 22
SW-846 8260	108-10-1	4-Methyl-2-pentanone	12	12	16 47
SW-846 8260	67-64-1	Acetone	12	12	23 27
SW-846 6010	7429-90-5	Aluminum	9	9	157 68
SW-846 6010	7440-36-0	Antimony	10	10	22 22
SW-846 6010	7440-38-2	Arsenic	10	10	13 79
SW-846 6010	7440-39-3	Barium	10	10	15 22
SW-846 8260	71-43-2	Benzene	12	12	11 39
SW-846 6010	7440-41-7	Beryllium	10	10	14 36
SW-846 8260	75-27-4	Bromodichloromethane	12	12	11 49
SW-846 8260	75-25-2	Bromoform	12	12	15 33
SW-846 8260	74-83-9	Bromomethane	12	12	14 54
SW-846 6010	7440-43-9	Cadmium	10	10	15 58
SW-846 8260	75-15-0	Carbon Disulfide	12	12	13 95
SW-846 8260	56-23-5	Carbon Tetrachloride	12	12	14 79
SW-846 8260	108-90-7	Chlorobenzene	12	12	18 11
SW-846 8260	75-00-3	Chloroethane	12	12	16 08
SW-846 8260	67-66-3	Chloroform	12	12	11 95
SW-846 8260	74-87-3	Chloromethane	12	12	22 15
SW-846 6010	7440-47-3	Chromium	10	10	33 82
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	12	12	9 78
SW-846 6010	7440-48-4	Cobalt	10	10	27 03
SW-846 6010	7440-50-8	Copper	9	9	93 75
SW-846 8260	124-48-1	Dibromochloromethane	12	12	10 64
SW-846 8260	100-41-4	Ethylbenzene	12	12	14 91
SW-846 8260	87-68-3	Hexachlorobutadiene	12	12	14 46
SW-846 6010	7439-89-6	Iron	5	5	60 77
SW-846 6010	7439-92-1	Lead	10	10	13 79
SW-846 6010	7439-93-2	Lithium	10	10	14 86
SW-846 6010	7439-96-5	Manganese	10	10	172 02
SW-846 6010	7439-97-6	Mercury	11	11	102 04
SW-846 8260	75-09-2	Methylene chloride	12	12	15 35
SW-846 6010	7439-98-7	Molybdenum	10	10	15 03
SW-846 8260	91-20-3	Naphthalene	12	12	28 58
SW-846 6010	7440-02-0	Nickel	10	10	14 69
SW846 8330	98-95-3	Nitrobenzene	2	2	4 12
SW-846 6010	7782-49-2	Selenium	10	10	12 72
SW-846 6010	7440-22-4	Silver	10	10	10 87
SW-846 6010	7440-24-6	Strontium	10	10	38 03
SW-846 8260	100-42-5	Styrene	12	12	153 25

Test Method	CAS No.	Analyte	No. of Sample Pairs	No. of Lab Batches	Max RPD
SW-846 8260	127-18-4	Tetrachloroethene	12	12	9.26
SW-846 6010	7440-31-5	Tin	10	10	10.91
SW-846 8260	108-88-3	Toluene	12	12	12.63
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	12	12	8.42
SW-846 8260	79-01-6	Trichloroethene	12	12	13.12
SW-846 6010	11-09-7	Uranium, Total	10	10	14.05
SW-846 6010	7440-62-2	Vanadium	10	10	18.18
SW-846 8260	75-01-4	Vinyl chloride	12	12	14.15
SW-846 8260	1330-20-7	Xylene	12	12	17.99
SW-846 6010	7440-66-6	Zinc	10	10	22.50

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 five percent. Table 12 indicates that field duplicate frequencies for this project were adequate with respect to all test methods.

The RPDs indicate how much variation exists in the field duplicate analyses. EPA data validation guidelines state that "there are no required review criteria for field duplicate analyses comparability" (EPA 1994b). For the DQA, the highest maximum RPDs were reviewed. The highest sample amounts for those analytes were corrected for the associated RPDs (Table 13), and the resulting numbers were compared to the ALs. For this project, all corrected concentration values were less than the ALs.

**Table 12
Field Duplicate Sample Frequency Summary**

Test Method	Sample Code	Number of Samples	% Duplicate Samples
ALPHA SPEC	REAL	6	16.67%
ALPHA SPEC	DUP	1	
GAMMA SPECTROSCOPY	REAL	69	8.70%
GAMMA SPECTROSCOPY	DUP	6	
SW-846 6010	REAL	29	13.79%
SW-846 6010	DUP	4	
SW-846 6200	REAL	44	9.09%
SW-846 6200	DUP	4	
SW-846 8260	REAL	49	14.29%
SW-846 8260	DUP	7	
SW-846 8330	REAL	7	14.29%
SW-846 8330	DUP	1	

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Table 13
RPD Evaluation Summary

Laboratory	Analyte	Max Result RPD
ESTLDEN	2,4-Dinitrotoluene	0 00
ESTLDEN	2,6-Dinitrotoluene	0 00
ESTLDEN	Aluminum	95 24
URS	Arsenic	12 27
ESTLDEN	Barium	16 44
URS	Barium	2 79
ESTLDEN	Beryllium	88 46
ESTLDEN	Chromium	35 90
ESTLDEN	Cobalt	98 14
ESTLDEN	Copper	122 94
URS	Copper	53 97
ESTLDEN	Iron	53 45
URS	Iron	29 07
ESTLDEN	Lead	9 52
ESTLDEN	Lithium	96 82
ESTLDEN	Manganese	50 00
URS	Naphthalene	50 00
ESTLDEN	Nickel	121 33
URS	Nickel	19 53
URS	Strontium	93 20
ESTLDEN	Strontium	46 67
URS	Tetrachloroethene	14 51
ESTLDEN	Vanadium	120 00
URS	Vanadium	56 66
URS	Zinc	61 28
ESTLDEN	Zinc	47 13

13.2.3 Completeness

Based on original project DQOs, a minimum of 25 percent of ER Program analytical (and radiological) results must be formally verified and validated. Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. Table 14 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 for this project. For this project, the percentages of analyses validated meet Program requirements.

13.2.4 Sensitivity

Reporting limits, in units of micrograms per kilogram (ug/kg) for organics, mg/kg for metals, and picocuries per gram (pCi/g) for radionuclides, were compared with RFCA WRW and ecological receptor ALs. Adequate sensitivities of analytical methods were

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attained for all COCs that affect remediation decisions "Adequate" sensitivity is defined as a reporting limit less than an analyte's associated AL, typically less than one-half the AL

13.3 Summary of Data Quality

RPDs greater than 35 percent indicate the sampling precision limits of some analytes have been exceeded In addition, two records were rejected However, these two data quality issues did not affect project decisions The data collected and used for IHSS Group 900-1 are adequate for decision making

**Table 14
Validation and Verification Summary**

Validation Qualifier Code	Total of CAS Numbers	Alpha Spectroscopy Results	Gamma Spectroscopy Results	SW-846 6010 Results	SW-846 6200 Results	SW-846 8260 Results	SW846 8330 Results
No V&V	1	0	0	0	0	1	0
1	1	0	0	0	0	1	0
J	63	0	0	38	25	0	0
J1	108	0	0	100	6	2	0
R	1	0	0	1	0	0	0
R1	1	0	0	1	0	0	0
V	1587	20	126	135	605	680	21
V1	1602	10	78	360	136	1018	0
JB	12	0	0	0	0	12	0
JB1	4	0	0	0	0	4	0
UJ	55	0	0	10	18	27	0
UJ1	43	0	0	22	2	19	0
Total	3478	30	204	667	792	1764	21
Validated	1718	20	126	184	648	719	21
% Validated	49 40%	66 67%	61 76%	27 59%	81 82%	40 76%	100 00%
Verified	1759	10	78	483	144	1044	0
% Verified	50 58%	33 33%	38 24%	72 41%	18 18%	59 18%	0 00%
Rejected	2	0	0	2	0	0	0
% Rejected	0 06%	0 00%	0 00%	0 30%	0 00%	0 00%	0 00%

Key

Codes for Validated Data J,V,JB,UJ
Codes for Verified Data 1,J1,V1,JB1,UJ1

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14.0 CONCLUSIONS

Results of the accelerated action justify NFAA. Justification is based on the following

- No further accelerated action required based on surface soil data. All surface soil analytical results are less than WRW ALs, except for one arsenic concentration. The elevated arsenic concentration in surface soil was 25.2 mg/kg, and the AL is 22.2 mg/kg. The 95% upper confidence limit for arsenic was less than one.
- No further accelerated action required based on the SSRS. Two arsenic concentrations (25.1 and 40 mg/kg) were greater than the WRW AL. The 40 mg/kg concentration was detected at a depth of over 20 feet below ground surface, beneath the Building 998 vault.
- No further accelerated action required by the stewardship evaluation.

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K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, Rocky Flats Environmental Technology Site, Golden, Colorado, October

K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v3, Rocky Flats Environmental Technology Site, Golden, Colorado, October

K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v3, Rocky Flats Environmental Technology Site, Golden, Colorado, October

K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v3, Rocky Flats Environmental Technology Site, Golden, Colorado, October

K-H, 2003, Final Project Closeout Report for the Building 993 Closure Report, Rocky Flats Environmental Technology Site, Golden, Colorado, April

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

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE ER REGULATORY CONTACT RECORD

Date/Time. February 3, 2004/ 0900

Site Contact(s) Gerry Kelly
Phone 303 966-4979

Regulatory Contact David Kruchek
Phone 303 692-3328

Agency CDPHE

Purpose of Contact IHSS Group 900-1 – Approval to Backfill the Building 993 Excavation

Discussion

Based on the sampling and analysis results associated with the Building 993 accelerated action, on February 19, 2003, CDPHE gave approval to Kaiser-Hill to backfill the excavation associated with the removal of the Building 993 explosive-bonding pit. All contaminant concentrations were below their wildlife refuge worker action levels, including explosive residue concentrations. Because the concrete waste was going to be disposed off-site as either low-level radioactive waste or sanitary waste, additional characterization was not considered necessary for proper disposal.

The Industrial Area Sampling and Analysis Plan Addendum for IHSS Group 900-1 (#IA03-03) indicated that six samples from the Building 993 area would be analyzed for explosive residue. However, based on the analytical results for four of the samples, CDPHE agreed that the two remaining explosive residue analyses were not necessary. The preliminary data reviewed indicated that most of the explosive residue chemicals of concern were non-detects. Only two explosive residue chemicals were detected, and their concentrations were less than their laboratory reporting limits.

For an unknown reason, a fifth sample was analyzed for explosive residue. The final data set from the laboratory indicates that all of the explosive residue chemicals of concern in all five samples were non-detects.

Contact Record Prepared By Gerry Kelly

Required Distribution

S Bell, RFFO
L Brooks, K-H ESS
L Butler, K-H RISS
C Deck, K-H Legal
S Gunderson, CDPHE
J Legare, RFFO
L Norland, K-H RISS

D Mayo, K-H RISS
J Mead, K-H ESS
S Nesta, K-H RISS
K North, K-H ESS
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
A Primrose, K-H RISS
E Pottorff, CDPHE

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE ER REGULATORY CONTACT RECORD

Date/Time January 15, 2004/ 0800

Site Contact(s) Annette Primrose Norma Castaneda
Phone 303 966-4385 303 966-4226

Regulatory Contact David Kruchek
Phone 303 692-3328

Agency CDPHE

Purpose of Contact IHSS Group 900-1 – Non-representative sample

Discussion

IASAP Addendum IA-03-03 for IHSS Group 900-1 includes collecting sediment samples at CO42-009, a drain outside the basement door on the east side of the building. The location was not accessible until recently because it was part of the beryllium containment area for the basement. When the location became accessible, we observed a basket type strainer in the drain with a small amount of sediment. This is recent sediment because it was quite soft and liquid, unlike older, more compacted sediment. The strainer was removed and no additional sediment was noted as far as could be seen.

The small amount of recent sediment was collected and analyzed for offsite metals. While the location was intended to sample the historical sediment in the drain, the sediment sampled is expected to be more indicative of the recent D&D operations in the area. Small bits of metal were noted in the sediment, probably from the cutting operations within the basement, and the metals results are expected to be high.

After discussions with the State, it was agreed that this sample did not represent the intent of the sampling plan and could be deleted. However, by the time the decision was made, the sample had already been analyzed. Therefore, it will be included in the report but not included in the data analysis.

Contact Record Prepared By Annette Primrose

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

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 S Tower, DOE

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**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ENVIRONMENTAL RESTORATION
REGULATORY CONTACT RECORD**

Date/Time: July 24, 2003

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

Regulatory Contact: Elizabeth Pottorff, Dave Kruchek, Harlen Ainscough, Carl Spreng
Phone: 303-692-3300
Gary Kleeman 303-312-6246

Agency: CDPHE, EPA

Purpose of Contact: Consultative Process Meeting-- Meeting Notes

Discussion

**July 24, 2003 Comment Resolution Meetings
For
IHSS Boundary Changes
IHSS Group 000-1 Closeout Report
IHSS Group 000-1 Data Summary Report
IHSS Group 300-6 Data Summary Report
IHSS 133.5 Draft Incinerator Notification
IHSS Group 900-11 Inner Lip Area Notification
IHSS Group 900-1 Field Sampling Deviations
IHSS Group 000-2 Draft IASAP Addendum
IHSS Groups 400-5 and 400-6 Draft IASAP Addendum**

A meeting was held on July 24, 2003 to discuss several topics including IHSS Boundary Changes, IHSS Group 000-1 Closeout and Data Summary Reports, IHSS Group 300-6 Data Summary Report, IHSS 133 5 Draft Incinerator Notification, IHSS Group 900-11 Inner Lip Area Notification, IHSS Group 900-1 Field Sampling Deviations, IHSS Group 000-2 Draft IASAP Addendum, and IHSS Groups 400-5 and 400-6 Draft IASAP Addendum

I Attendees

CDPHE Harlen Ainscough, Dave Kruchek, Elizabeth Pottorff, Carl Spreng

EPA Gary Kleeman
DOE Russ McCallister
K-H Marcella Broussard
K-H Team Nick Demos, Susan Serreze

II Report Status

Upcoming report status was not discussed

III Issues

There is a discrepancy between sampling for VOCs in the subsurface and the action requirements in RFCA

IV Specific Comments

IHSS Boundary Changes

- 1 The IHSS 300-134(S) boundary will be changed so that the southern boundary is at the Building 331 foundation wall
- 2 The IHSS 700-163 2 boundary will not be changed
- 3 The IHSS 000-101 boundaries will be changed to match the SEP PAM AOC The additional area not included in the AOC will be transferred to IHSSs 165 and 176, IHSS Group 700-7, and IHSS Group 700-11

IHSS Group 000-1 Closeout and Data Summary Reports

Page changes for these reports were provided to the regulatory agencies

IHSS Group 300-6 Data Summary Report

A page change for this report was provided to the regulatory agencies

IHSS 133.5 Draft Incinerator Notification

The draft Incinerator Notification modifications, made in accordance with regulatory agency comments, were handed out

The following resolutions were agreed to

- 1 Performance monitoring information will be added to the notification
- 2 Add a statement to SSRS screen 4 that indicates the incinerator is in an area prone to erosion Also add a statement that indicates activities conducted in accordance with this notification will reduce the potential for erosion

- 3 Figure 2 will be edited for clarity Contour lines will be added to Figure 2
- 4 The typographical error in the first sentence of Section 2 4 3 will be corrected
- 5 The document will be revised and sent for verification and approval

IHSS Group 900-11 Inner Lip Area Notification

- 1 A map illustrating the potential remediation area was provided as an example This example was acceptable
- 2 A map illustrating the potential soil vacuum treatability areas was provided as an example This example was acceptable
- 3 Other sections of the Draft Notification are being revised These will be sent to EPA when completed

IHSS Group 900-1 Field Sampling Deviations

VOC samples were collected from the "A" interval at three locations beneath asphalt instead of the "B" interval as specified in the IASAP Addendum CDPHE concurred that these samples were collected correctly

IHSS Group 000-2 Draft IASAP Addendum

The Draft IHSS Group 000-2 IASAP Addendum was provided to the regulatory agencies The format and content of the addendum was discussed

RFETS staff asked for a approval to collect samples from seven locations south of Building 774 before formal approval of the addendum RFETS staff would like to sample these locations before or during the D&D staff removed the tanks in the area

- 1 A statement will be added to the addendum indicating that OPWL sampling other than the RFCA-specified sampling is being conducted in accordance with other addenda

IHSS Groups 400-5 and 400-6 Draft IASAP Addendum

- 1 If sampling results indicate VOCs are present additional sampling at depth may be needed
- 2 If sampling results indicate VOCs at depth, and additional monitoring well southeast of the IHSS Group may be warranted
- 3 IHSS 400-205 will be listed as "Under the southeastern portion of Building 460", in Table 1

- 4 Existing sampling results have undergone data quality assessment and have been evaluated through the Data Quality Filter
- 5 Figure 2 will include IHSSs, PACs, and UBCs in the immediate area
- 6 Unneeded sampling locations will be deleted
- 7 Figures 2 and 3 will be corrected to show all previous sampling locations
- 8 The Building 444, Room 502 gutter, downspout, and ground surface will be investigated and additional samples added if needed. Alternatively, statistical samples may be relocated to capture these features
- 9 Samples will be collected from immediately off of the step-off pad. This will be a field adjustment. A statement will be added to the text to indicate that field adjustments will be made for this other features
- 10 VOC sample intervals will be changed from the "B" interval to the "A" interval
- 11 Text will be added to clarify that VOC sampling at depth is because of previously detected compounds in the subsurface

IV Meetings

The next meeting is scheduled for Thursday, August 7, 2003, from 10 00 AM to 12 00 PM

Distribution:

H Ainscough, CDPHE
 S Gunderson, CDPHE
 D Kruchek, CDPHE
 E Pottorff, CDPHE
 C Spreng, CDPHE
 G Kleeman, USEPA
 N Castenada, RFFO
 R McCallister, RFFO

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 L Norland, K-H RISS
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 A Primrose, K-H RISS
 D Shelton, K-H
 K Wiemelt, K-H RISS

W Chromec, K-H Team
 K Griggs, K-H Team
 G Kelly, K-H Team
 B Koehler, K-H Team
 S Luker, K-H Team
 G Pudlick, K-H Team
 D Reeder, K-H Team
 M Ruthven, K-H Team
 S Serreze, K-H Team
 E Woodland, K-H Team
 Administrative Record
 ER Meeting Minutes

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**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ENVIRONMENTAL RESTORATION
REGULATORY CONTACT RECORD**

Date/Time: July 21, 2003

Site Contact(s): Norma Castaneda, Russ McCallister, Marla Broussard,
Susan Serreze

Phone: 303-966-4226, 303-966-9692, 303-966-6007, 303-966-2677

Regulatory Contact: CDPHE Elizabeth Pottorff, Dave Kruchek, Harlen Ainscough
EPA Gary Kleeman

Phone: 303-692-3429, 303-692-3328, 303-692-3337
303-312-6246

Agency: CDPHE, EPA

Purpose of Contact: Consultative Process Meeting IHSS Group 900-1

Discussion

A meeting was held on July 14, 2003, to discuss the IHSS Group 900-1, Building 991 Tunnel characterization data. Based on the data provided, CDPHE approved a No Further Accelerated Action (NFAA) for the Building 991 Tunnel. The NFAA will be documented in the Historical Release Report.

Distribution

H Ainscough, CDPHE	L Brooks, K-H ESS	K Griggs, K-H Team
S Gunderson, CDPHE	M Broussard, K-H RISS	G Kelly, K-H Team
D Kruchek, CDPHE	L Butler, K-H RISS	S Luker, K-H Team
E Pottorff, CDPHE	R Davis, K-H RISS	D Radtke, K-H Team
C Spreng, CDPHE	C Deck, K-H Legal	D Reeder, K-H Team
T Rehder, USEPA	D Mayo, K-H RISS	M Ruthven, K-H Team
G Kleeman, USEPA	J Mead, K-H ESS	S Serreze, K-H Team
N Castaneda, RFFO	S Nesta, K-H RISS	T Spence, K-H Team
R DiSalvo, RFFO	L Norland, K-H RISS	D Strand, K-H Team
R McCallister, RFFO	K North, K-H ESS	E Woodland, K-H Team
S Surovchak, RFFO	A Primrose, K-H RISS	Administrative Record
R Tyler, RFFO	D Shelton, K-H ESS	ER Meeting Minutes
	K Wiemelt, K-H RISS	

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE DRAFT ER REGULATORY CONTACT RECORD

Date/Time February 18, 2003/8 45 am

Site Contact(s) Gerry Kelly
Phone 303-966-4979

Regulatory Contact Dave Kruchek
Phone 303-692-3328

Agency CDPHE

Purpose of Contact GS-10 Source Evaluation

Discussion

CDPHE approved the ER IASAP Addendum to characterize IHSS Group 900-1 (IASAP FY03 Addendum #IA03-03), but noted that additional investigation is expected to properly identify the source or sources of the contamination seen at GS-10. Presented below is Kaiser-Hill's general, phased approach for this additional investigation, which was communicated to CDPHE. No agreement has yet been reached regarding this approach, and specific objectives and plans will need to be developed to adequately investigate contaminant sources.

- Characterize IHSS Group 900-1 surface and subsurface soils during FY03 per Addendum #IA03-03
- Proceed with existing plans to install in early CY03 a new surface water performance monitoring station (SW-021), which will be located downstream of Building 991 and will assist in evaluating potential surface water quality impacts from the Building 991 area
- During the B Ponds remediation project, characterize the B Ponds drainage area, including the S Walnut Cr stream reach between Bldg 991 and GS-10. Coordinate characterization with the Actinide Migration Evaluation to maximize the source evaluation.

The Environmental Restoration, Surface Water, and Actinide Migration Evaluation groups will evaluate all of the data collected as part of the above-listed characterization to determine the scope and extent of remediation of the B Ponds drainage area. Remediation of the B Ponds is scheduled to occur during late FY04, after much of the upstream building demolition has occurred. Therefore, the B Pond remediation project will evaluate any potential positive or negative impacts associated with upstream building demolition and remediate as necessary.

Dave Kruchek mentioned that the Site might need to install another surface water monitoring station if SW-021 data does not identify the source of contamination seen at GS-10 (i.e., if the source of contamination is not the Bldg 991 area). He mentioned that there is already some surface water and sediment data that indicate the Bldg 991 area might not be a contamination source. He also said that the need for an additional station needs to be determined relatively quickly because time needed to install another station and evaluate its data is running out.

While K-H agrees that installation of an additional surface water monitoring station will be evaluated, it is most likely that the source is relatively low-level, and well distributed after 50 years of Site operations. In that case, additional surface water monitoring locations are unlikely to get to the root of the issue, and other evaluations will need to be performed. Such evaluations will be designed through the Integrated Monitoring Program and finalized through the RFCA consultative process.

Contact Record Prepared By Gerry Kelly

Required Distribution

S Bell, RFFO
L Brooks, K-H ESS
L Butler, K-H RISS
C Deck, K-H Legal
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Additional Distribution

(choose names as applicable)

M Broussard, K-H RISS
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G Kleeman, USEPA
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A Primrose, K-H RISS
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C Dayton, K-H ESS

**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD**

Date/Time: January 28, 2003/10 15 am

Site Contact(s): Steve Nesta
Phone: (303) 966-6386

Regulatory Contact Dave Kruchek
Phone: (303) 692-3328
Agency: CDPHE

Purpose of Contact. Waste disposition of the B993 slab

Discussion

The D&D RLCR and the D&D RSOP notification for the 993 building refer to disposition of this slab as low level waste. However, the RLCR showed that the slab itself met free release criteria. The explosive bonding pit within the building slab is not accessible and a waste stream determination could not be made at the time the RLCR was completed. Because explosives were used at this location, it is agreed that the concrete will not be recycled. However, the portion of the building slab that meets the free release criteria will be sent to the sanitary landfill.

The explosive bonding pit and fill material will be evaluated when access is obtained. If filled with concrete, the pit and fill will be disposed as low-level waste. However, if a removable fill material is present, this will be sampled to determine appropriate waste disposition. The pit walls and floor will also be evaluated unless these are dispositioned as low level waste without further analyses. None of this waste will be recycled.

Contact Record Prepared By: Steve Nesta

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
S Surovchak, 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
R Tyler, RFFO
N Castaneda, RFFO
R McCalister, RFFO

Additional Distribution

(choose names as applicable)

M Broussard, K-H Team
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G Kelly, K-H Team
M Burmeister, K-H Team
H Marschall, K-H Team

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE ER REGULATORY CONTACT RECORD

Date/Time: January 24, 2003/2 00 pm

Site Contact(s): Annette Primrose
Phone: (303) 966-4385

Regulatory Contact Dave Kruchek
Phone: (303) 692-3328
Agency: CDPHE

Purpose of Contact. Removal of B993 slab

Discussion

The ER RSOP notification for IHSS Group 900-1 (#03-05) currently is in review by CDPHE. However, the outstanding issue for the B993 slab removal portion of this notification is the uncertainty concerning slab disposal. As discussed, this slab was already proposed to be disposed of as low-level waste in the D&D RSOP notification. The ER RSOP notification will be revised to reflect this change. Based on this revision, work can proceed on the B993 slab removal prior to finalization of the notification. DOE concurs with this decision.

Contact Record Prepared By: Annette Primrose

Required Distribution.

S Bell, RFFO
L Brooks, K-H ESS
L Butler, K-H RISS
C Deck, K-H Legal
R DiSalvo, RFFO
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J Legare, RFFO
S Surovchak, RFFO

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J Mead, K-H ESS
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R Tyler, RFFO
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R McCallister, RFFO

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E Pottorff, CDPHE
T Lindsay, K-H Team
S Serreze, K-H Team
G Kelly, K-H Team

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE ER REGULATORY CONTACT RECORD

Date/Time January 23, 2003/ 11 00 am
Site Contact(s) Gerry Kelly, Susan Serreze and Annette Primrose
Phone 303-966-4979
Regulatory Contact Dave Kruchek
Phone (303) 692-3328
Agency CDPHE

Purpose of Contact Sampling within PAC 900-1307

Discussion

The ER Industrial Area Sampling and Analysis Plan (IASAP) Addendum for IHSS Group 900-1 (#IA-03-03) currently is being reviewed by CDPHE. However, two issues related to sampling and analysis at PAC 900-1307 were discussed (i.e., analysis for explosives and clarification of subsurface sampling). As discussed, all soil samples will be analyzed for explosives using Method SW8330. In addition, the sample under the building slab will be collected from 0 to 0.5 feet, and the sample under the building sump will be collected directly under where the sump is actually located, currently estimated at 6 feet. The ER IASAP Addendum will be revised to reflect the analysis for explosives and the sampling clarification. Based on these revisions, sampling within PAC 900-1307 can proceed.

Contact Record Prepared By Gerry Kelly

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

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
R McCallister, RFFO

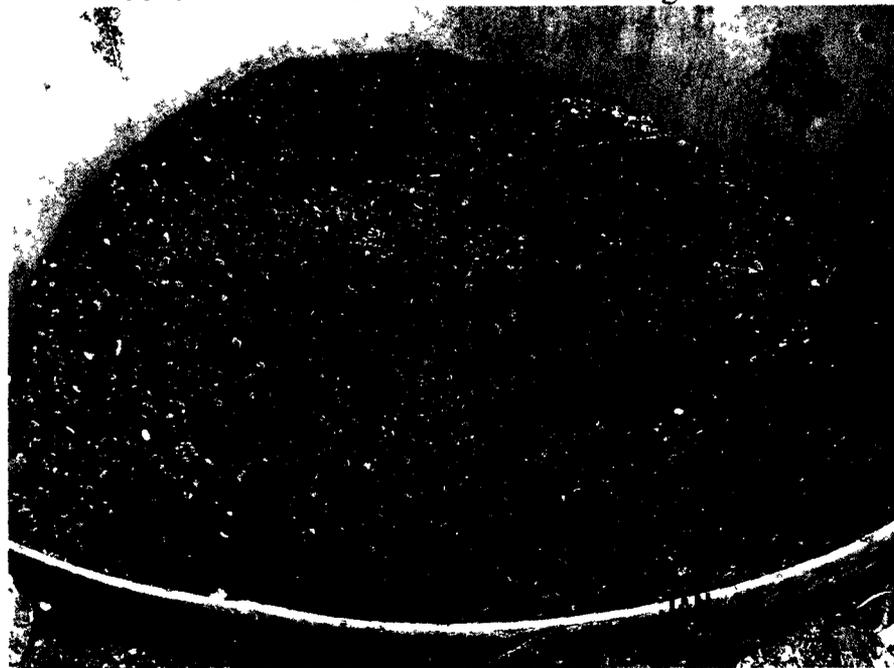
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A Primrose, K-H RISS
G Kleeman, USEPA
D Kruchek, CDPHE
L Norland, K-H RISS
T Lindsay, K-H Team
H Marschall, K-H Team
S Serreze, K-H Team



Concrete debris from the removed Building 993 slab



Gravel and road base fill in the Building 993 explosive-bonding tank

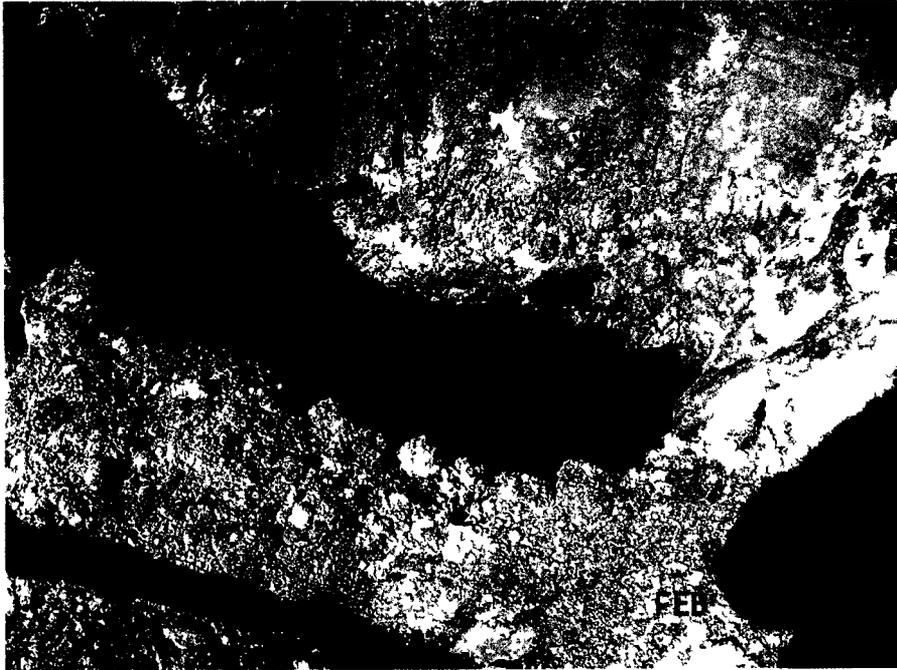


Fill removal from the Building 993 explosive-bonding tank



Concrete debris from the removed explosive-bonding tank foundation

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Excavation pit after removal of the explosive-bonding tank



Removed explosive-bonding tank

Appendix C
Assessment of the Building 991 Fire on Surface Water Quality

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Assessment of the Building 991 Fire on Surface Water Quality

In accordance with normal discharge protocols, on February 23, 2004, Pond B-5 was prepared for discharge, water quality had been confirmed by both the Colorado Department of Public Health and Environment, and the Site, and discharge notifications had been sent to neighboring communities. Normally, there is a two-week turn around time for analytical results and the pond was sampled on February 3, 2004. As part of the discharge procedure, Site personnel scrutinize all routine operations reports for any off-normal events that may impact water quality during the two weeks between sampling and discharge.

Because of the Bldg 991 event on February 12th, the release of Pond B-5 was postponed, and an additional sampling event was conducted on February 23rd. The results of the supplemental analyses for volatile and semivolatile organic compounds and total cyanide show that the water quality in Pond B-5 continues to meet all applicable standards, and the discharge was rescheduled.

The postponement of the Pond B-5 discharge was in response to the fire in Building 991, first reported on February 12th. BASF® Foam was being applied in preparation for the D&D of the building. The foam curing process is exothermic, and due to possible improper installation, the heat of reaction was retained within the insulating foam rather than being dissipated, resulting in combustion. The emergency response actions included the immediate application of water to the area of combustion, combined with water berm containment measures to keep fire water from flowing uncontrolled into the adjacent drainage. Further containment steps included the diversion of South Walnut Creek, the drainage from B991, into Pond B-1. Pond B-1 is normally operated as a non-discharge pond, and is maintained for emergencies such as the B991 fire where runoff can be captured and managed, as needed. Eventually, firewater from B991 overflowed berm containment and entered South Walnut Creek through a storm water drain, but due to the diversion, it was completely contained in Pond B-1. Water continued to be applied to the B991 foam continuously until February 19th, at which time all hot spots had been eliminated and the application of water stopped.

Water quality was monitored in the fire water at B991, in South Walnut Creek just above Pond B-1 (and just below GS10), in Pond B-1 and in Pond B-5. Water from the area of combustion contained detectable levels of constituents reasonably expected under the conditions – styrene, toluene, benzene, chlorinated hydrocarbons, and cyanide. While metals are not part of the foam composition, some low levels were detected. Pond B-1 was sampled after the application of water to B991 ceased on February 19th, and was analyzed for the same suite of analytes as the fire water. There were no detections of organic compounds, and while the fire water at B991 had 8,540 ppb total cyanide, Pond B-1 results indicated 2 ppb. There were no detections in the ponds of any parameter above applicable water quality standards, including the organics, metals and other analytes shown in Attachment 1. The water quality standard for cyanide is 5 ppb ($\mu\text{g/L}$) as free cyanide.

Results of the February 23rd sampling event for Pond B-5 were similar to those for Pond B-1 – no organic analytes were detected, and the total cyanide result was 4.6 ppb. Likewise, the sample collected in South Walnut Creek had no detectable organic analytes, but, in contrast to the pond samples, did contain an elevated level of cyanide at 36.5 ppb (analytical results from all of these locations is presented in Attachment 1). The South Walnut Creek sample was collected in a small pool just downstream of monitoring location GS10, and immediately upstream of the B-1 Inlet Works (see Attachment 2). This location has likely accumulated solid material washed from the B991 area, including foam particles containing isocyanates which are components of the foam. Because the cyanide method used was for total cyanide, any suspended material in the sample, including particulates derived from the foam, would be digested during sample preparation and be detected as cyanide.

The State's stream standard for cyanide is as "Free" cyanide (HCN), the form known to be toxic to fish. The results reported here are for total cyanide, which include the free cyanide species. Cyanide has never been a contaminant of concern at Rocky Flats, and is not included in any of the monitoring activities conducted under the Integrated Monitoring Plan, pre-discharge monitoring conducted by the state, nor any

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March 4, 2004

of the community monitoring conducted at the Site boundary. Because the water quality results for Pond B-5 are within all applicable water quality standards, including cyanide, the immediate discharge of the pond is appropriate.

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March 4, 2004

ATTACHMENT 1

Data Summaries for B991 Fire Water, Pond B-1, Pond B-5 and South Walnut Creek

A Analytes Detected in Fire Water Sampled at B991 February 13, 2004

Table 1 Volatile and Semivolatile Organic Parameters Detected in Fire Water Sampled at B991

Parameter	Concentration, $\mu\text{g/L}$	Water Quality Standard, $\mu\text{g/L}^*$
Bromomethane	973	-
Chloroethane	999	-
Acetone	36100	-
Benzene	3370	5300
1,2-dichloropropane	4860	23000
Toluene	10600	17500
1,2-Dibromoethane	545	-
Xylenes (total)	4790	-
Styrene	708	-

* Acute Aquatic Life Standards

Table 2 Metals Detected in Fire Water Sampled at B991

Parameter	Concentration, $\mu\text{g/L}$	Water Quality Standard, $\mu\text{g/L}^*$
Arsenic	11.5	340
Cadmium	10.8	6.3
Calcium	15200	-
Chromium	2.8	16
Cobalt	1.54	-
Copper	19.0	18.8
Iron	685	-
Lead	4.42	95.1
Magnesium	1840	-
Manganese	52.5	3363.5
Molybdenum	1.30	-
Nickel	1.88	633.7
Potassium	2830	-
Silver	0.383	3.8
Sodium	7530	-
Strontium	75.3	-
Thallium	0.475	-
Uranium	0.138	3563
Zinc	1570	158.7
Aluminum	181	750
Antimony	3.85	-
Selenium	56.4	18.4
Lithium	1.97	-

* Acute Aquatic Life Standards

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Table 3 Other Analytes Detected in Fire Water Sampled at B991

Parameter	Concentration, µg/L	Water Quality Standard, µg/L*
Fluoride	7400	2000
Nitrate-N	179	10000
Sulfate	7250	250000
Bromide	40000	-
Chloride	52100	250000
Cyanide, Total	8540	5

* Acute Aquatic Life Standards

B Analytes Detected in Pond B-1 Sampled February 19, 2004

Table 4 Volatile and Semivolatile Organic Parameters Detected in Pond B-1

Parameter	Concentration, µg/L	Water Quality Standard, µg/L*
No detections		

* Acute Aquatic Life Standards

Table 5 Metals Detected in Pond B-1

Parameter	Concentration, µg/L	Water Quality Standard, µg/L*
Arsenic	1 34	340
Calcium	40800	-
Chromium	1 65	16
Cobalt	1 03	-
Copper	1 36	18 8
Iron	463	-
Lead	307	95 1
Magnesium	13100	-
Manganese	178	3363 5
Molybdenum	3 85	-
Nickel	2 94	633 7
Silver	066	3 8
Sodium	117000	-
Strontium	362	-
Thallium	319	-
Uranium	1 62	3563
Zinc	7 55	158 7
Aluminum	77 5	750
Antimony	364	-
Lithium	44 4	-

* Acute Aquatic Life Standards

Table 6 Other Analytes Detected in Pond B-1

Parameter	Concentration, µg/L	Water Quality Standard, µg/L*
Fluoride	502	2000
Nitrate-N	228	10000
Sulfate	4740	250000
Bromide	501	-
Chloride	235000	250000
Cyanide, Total	2.05	5

* Acute Aquatic Life Standards

C Analytes Detected in Pond B-5 Sampled February 23, 2004

NOTE Only Organic parameters and Total Cyanides were requested

Table 7 Volatile and Semivolatile Organic Parameters Detected in Pond B-5

Parameter	Concentration, µg /L	Water Quality Standard, µg/L*
No detections		

* Acute Aquatic Life Standards

Table 8 Other Analytes Detected in Pond B-5

Parameter	Concentration, µg/L	Water Quality Standard, µg/L*
Cyanide, Total	4.59	5

* Acute Aquatic Life Standards

D Analytes Detected in South Walnut Creek (SWC) below GS10 Sampled February 23, 2004

NOTE Only Organic parameters and Total Cyanides were requested

Table 9 Volatile and Semivolatile Organic Parameters Detected in SWC

Parameter	Concentration, µg /L	Water Quality Standard, µg/L*
No detections		

* Acute Aquatic Life Standards

Table 10 Other Analytes Detected in SWC

Parameter	Concentration, µg/L	Water Quality Standard, µg/L*
Cyanide, Total	36.5	5

* Acute Aquatic Life Standards

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NORMALIZED DATA SET COMPACT DISC

PRE-ACCELERATED ACTION AND ACCELERATED ACTION DATA

10
90



Figure 1
IHSS Group 900-1
Location

KEY

-  IHSS Group 900 1
-  Demolished building
-  Standing building
-  Paved road
-  Dirt road



Scale 1:6,000
 0 200 400 600 Feet

State Plane Coordinate Projection
 Colorado Central Zone
 Datum NAD 27

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

Prepared by



Prepared for

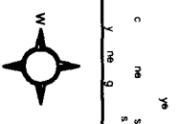
Figure 2
Existing Samples
Above Background Mean
Plus Two Standard Deviations
or Detection Limit

KEY

- Eco AL Exceedance
- Detection below AL

- ▬ Paved Roads
- ▬ IHSS
- ▬ Under Building Contamination
- ▬ Potential Area of Concern
- ▬ Building
- ▬ Dirt Roads
- ▬ Fence

Wrw_al = Wildlife refuge
worker action level
Eco_al = Ecological receptor
action level
M_2SD = Background mean plus
two standard deviations
Mdl = Method detection limit



Scale 1:1575
State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

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

Prepared by



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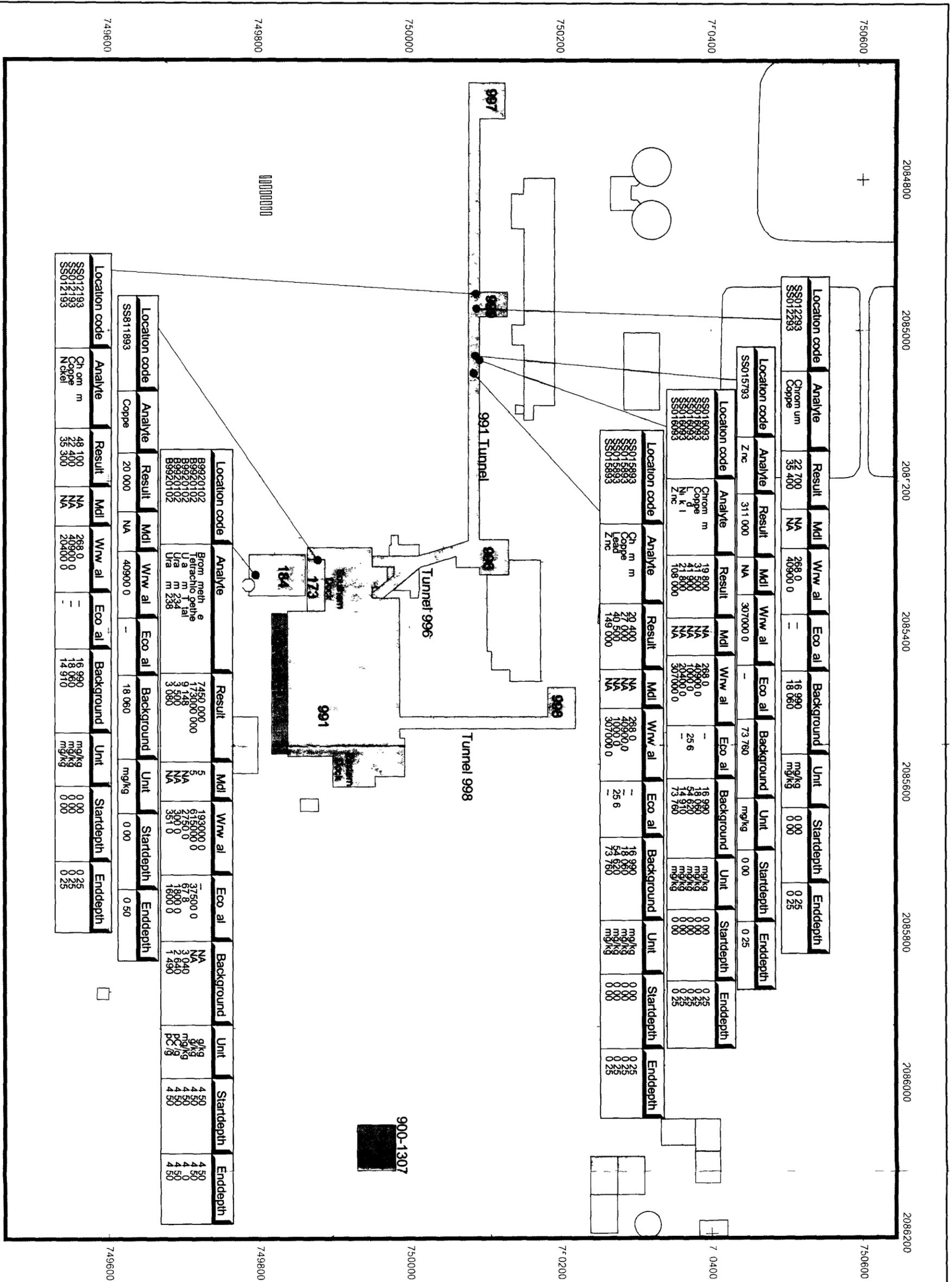


Figure 3
Accelerated Action
Sampling Locations and
Results at IHSS Group 900-1
Surface Soil and Sediments

KEY

- Soil WRW AL Exceedance
- Soil Eco AL Exceedance
- Soil Detection below AL
- Sediment Eco AL Exceedance
- ▭ UBC
- ▭ IHSS
- ▭ PAC
- ▭ Paved road
- ▭ Storm drains
- ▭ Foundation drains

RL = Reporting limit
 Background = Background mean plus two standard deviations
 Ww al = Wildlife refuge worker action level
 Eco al = Ecological receptor action level

N



Scale = 1 : 850



State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by: **RADMS** Date: 02.26.04

