

# **NOTICE**

**All drawings located at the end of the document.**

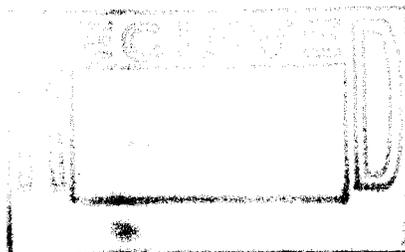


**Draft Data Summary Report  
for IHSS Group 700-10**

**PAC 700-1101  
Laundry Tank Overflow – Building 732**



**August 2004**



IA-A-002295

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Approval received from the Colorado Department of Public Health and Environment  
( ).  
Approval letter contained in the Administrative Record

**August 2004**

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## ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
AR	Administrative Record
ASD	Analytical Services Division
CAS	Chemical Abstracts Service
CD	compact disc
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ft	foot
ft <sup>2</sup>	square foot
FY	Fiscal Year
HPGe	high-purity germanium
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
K-H	Kaiser-Hill Company, L.L.C.
LCS	laboratory control sample
µg/kg	micrograms per kilogram (may be found as ug/kg)
µg/L	micrograms per liter (may be found as ug/L)
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable
NFAA	No Further Accelerated Action
PAC	Potential Area of Concern
PAH	polyaromatic hydrocarbon
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
pCi/g	picocuries per gram
PCOC	potential contaminant of concern
POE	Point of Evaluation
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RIN	report identification number
RISS	Remediation, Industrial Decommissioning and Demolition, and Site Services
RL	reporting limit
RPD	relative percent difference

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RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SD	standard deviation
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
SWD	Soil Water Database
WRW	wildlife refuge worker
VOC	volatile organic compound
V&V	verification and validation

## **1.0 INTRODUCTION**

This Data Summary Report summarizes accelerated action characterization activities conducted at Individual Hazardous Substance Site (IHSS) Group 700-10, consisting of Potential Area of Concern (PAC) 700-1101 Laundry Tank Overflow – Building 732, at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. Characterization activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) (DOE 2001) and IASAP Addendum #IA-04-07 (DOE 2004). The IASAP Addendum was approved by the Colorado Department of Public Health and Environment (CDPHE) on January 9, 2004. Ecological effects will be evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and the ecological risk assessment portion of the Sitewide Comprehensive Risk Assessment (CRA).

Approval of this Data Summary Report constitutes regulatory agency concurrence that IHSS Group 700-10 is a no further accelerated action (NFAA) site. This information and NFAA determination will be documented in the Fiscal Year (FY) 2004 (04) Historical Release Record.

## **2.0 SITE CHARACTERIZATION**

IHSS Group 700-10, PAC 700-1101, consists of Building 732. The general location of IHSS Group 700-10 at RFETS is shown on Figure 1, and a more detailed location is shown on Figure 2.

IHSS Group 700-10 is located within the RFETS IA close to other contaminant sources (Figures 1 and 2). IHSS Group 000-2 includes IHSS 000-162 (Radioactive Site 700 Area), which surrounds IHSS Group 700-10. IHSS Group 700-3 contains IHSS 700-150.2(S) (Radioactive Site West of Buildings 771/776) and IHSS 700-150.7 (Radioactive Site South of Building 776); IHSS 700-150.2 (S) lies north of IHSS Group 700-10, and IHSS 700-150.7 lies to the east. IHSS Group 500-3 contains IHSS 500-159 (Radioactive Site Building 559), which lies to the south. Sampling is in progress in all three IHSS Groups surrounding Group 700-10, with the intent of writing either Data Summary or Closeout Reports to obtain NFAA determinations.

IHSS Group 700-10 characterization information consists of historical knowledge, previously collected analytical data, and accelerated action analytical data. Existing information and data for IHSS Group 700-10 are available in Appendix C of the IASAP (DOE 2001), the IA Data Summary Report (DOE 2000), and the historical release reports (HRR) (DOE 1992-2003). These data are discussed in Section 2.1.

Accelerated action analytical data for IHSS Group 700-10 are summarized in Section 2.2. A compact disc (CD) is enclosed, which contains the real and quality control (QC) accelerated action data for this project. The CD contains a data set in which analyte names, Chemical Abstracts Service numbers (CAS), and units are standardized, and derived analytes are provided.

## 2.1 Historic Information and Data

IHSS Group 700-10, PAC 700-1101, consists of Building 732 (Figures 1 and 2). Building 732 consists of two parts, a reinforced-concrete stairwell approximately 7 x 17.6 feet (ft) in area and 8 ft high. The stairwell goes down to the south and then opens to the east into an underground reinforced-concrete room 14 x 27.7 ft in extent. Undisturbed earth below the room is approximately 13.7 ft below current grade. Within the room is a 1,000-gallon fiberglass holding tank (T-4), two pumps, and two banks of particulate filters. In the southeastern corner of the room is a sump (1.5 x 1.5 ft in area and 2 ft deep). At the time of construction, the walls of Building 732 were waterproofed on the inside and outside. In the early 1990's additional sealing was applied to all exterior-wall, ceiling, and floor joints.

There are no process lines or foundation drains under the building.

In the past, under normal operations laundry water and water from floor drains in Building 778 were pumped to Building 732, filtered, and passed on to Valve Vault 9, eventually reaching Building 374 for treatment. Water collected in the 732 sump was pumped back to a secondary containment sump in Building 778. From there it was returned to the tank in Building 732.

In June 1979 laundry wastewater in Tank T-4 overflowed onto the room floor due to malfunctioning pumps that normally send the wastewater through the filters. Records do not indicate whether the sump was able to pump the overflow back to Building 778 or whether additional secondary pumping was necessary. It is possible that laundry wastewater was released to the environment. Because of the nature of building activities, it is probable that this material may have been a low-level waste (DOE 1992-2003).

No characterization of soil beneath or immediately adjacent to the Building 732 foundation slab had been conducted prior to accelerated action activities.

## 2.2 Accelerated Action Characterization Data

IASAP Addendum #IA-04-07 (DOE 2004) specified that the potential contaminants of concern (PCOCs) for IHSS Group 700-10 were radionuclides based on process knowledge. Volatile organic compounds (VOCs) (all locations) and metals (only CE44-030, see below) were also analyzed as a best management practice (BMP).

Accelerated action analytical data for IHSS Group 700-10 were collected in accordance with IASAP Addendum #IA-04-07 (DOE 2004). Sampling specifications, including PCOCs, are presented in Table 1. Deviations from the IASAP Addendum are also presented and explained in Table 1. Table 2 presents a summary of accelerated action sampling and analyses. The locations of samples and analytical results greater than background means plus two standard deviations or reporting limits (RLs), including wildlife refuge worker (WRW) action level (AL) exceedances, are listed in Table 3 and shown on Figure 3. Uranium-234 activities based on high purity germanium (HPGe) results (derived from uranium-238 gamma spectroscopy results are shown in Table 3 in italics.

**Table 1**  
**IHSS Group 700-10 Accelerated Action Characterization Specifications and Sampling Deviations**

Location	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Media	Actual Depth Interval (ft)	Actual Analytes	Comments/Deviations
CE44-027	2083613.736	750315.440	2083616.844	750315.278	Subsurface Soil	12.5-14.5 14.5-16.5 16.5-18.5 18.5-20.5 20.5-22.0	Radionuclides VOCs	Biased; targeted on down gradient side of building opposite tank; both alpha and gamma spectrometry samples collected in all intervals; radionuclide samples in lower three intervals not in SAP Addendum; moved 3.1 ft east to avoid building footer; 20.5-22.0 interval short due to partial recovery.
CE44-028	2083613.823	750306.196	2083616.561	750305.834	Subsurface Soil	12.5-14.5 14.5-16.5 16.5-18.5 18.5-20.5 20.5-22.5	Radionuclides VOCs	Biased; targeted on down gradient side of building opposite pumps; both alpha and gamma spectrometry samples collected; radionuclide samples in lower three intervals not in SAP Addendum; moved 2.7 ft east to avoid building footer; no change in intervals.
CE44-029	2083613.649	750296.300	2083613.054	750291.230	Subsurface Soil	12.5-14.5 14.5-16.5 16.5-18.5 18.5-20.0 20.8-22.8	Radionuclides VOCs	Biased; targeted on down gradient side of building opposite filter rack and sump; only gamma spectrometry samples collected; moved 5 ft south because sample device hit building footer and got no recovery; interval 18.5-20.0 short due to expanding clays and partial recovery, 20.8-22.8 interval adjusted to collect full 2-ft interval.

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Location	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Media	Actual Depth Interval (ft)	Actual Analytes	Comments/Deviations
CE44-030	2083610.785	750296.864	2083610.798	750296.885	Groundwater	0.0-0.5	Radionuclides Metals VOCs	Biased; proposed to target soil below sump, however sump and floor of Bldg 732 were covered by water; sample was changed to incidental water with same analytes; sample collected from sump; see Contact Record dated 7/8/04.
CE44-031	2083606.292	750294.238	2083605.869	750291.847	Subsurface Soil	12.5-14.5 14.5-16.5 16.5-18.5 18.5-20.5 20.5-22.5	Radionuclides VOCs	Biased; targeted on down gradient side of building opposite filter rack and sump; only gamma spectrometry samples collected; radionuclide samples in lower three intervals not in SAP Addendum; moved 2.4 ft south because sample device hit building footer and got no recovery, no change in intervals.

VOC = volatile organic compound

**Table 2**  
**IHSS Group 700-10 Accelerated Action Soil Sampling and Analysis Summary**

<b>Criteria</b>	<b>Proposed Soil Analyses</b>	<b>Actual Soil Analyses*</b>
Number of Sampling Locations	5	4
Number of Samples	25	20
Number of Radionuclide Analyses	10	30
Number of Metal Analyses	2	0**
Number of VOC Analyses	25	20

\*Sample collection at Location CE44-030 was changed from soil to incidental water when it was found that the sump and part of the floor of Building 732 was covered by water; see Contact Record July 8, 2004, Appendix A.

\*\*Metal samples in two intervals at Location CE44-030 were proposed in the SAP Addendum. Incidental water was collected at Location CE44-030 and analyzed for radionuclides, VOCs, and metals. In the incidental water, dissolved, arsenic, copper, mercury, nickel, vanadium, and zinc were detected at levels above background but less than Tier I and Tier II ALs. There were no results greater than background for total analytes. The incidental water data is included on the enclosed CD.

**Table 3**  
**IHSS Group 700-10 Accelerated Action Characterization Data**  
**Greater Than Background Means Plus Two Standard Deviations**  
**or Reporting Limits**

Location	Northing	Easting	Analyte	Result	RL	WRW AL	Background Mean + 2 Standard Deviations	Unit	Start Depth (ft)	End Depth (ft)
CE44-027	750315.278	2083616.844	Trichloroethene	3.300	1.100	19600	NA	µg/kg	12.5	14.5
CE44-027	750315.278	2083616.844	1,2,4-Trichlorobenzene	0.850	0.810	9230000	NA	µg/kg	14.5	16.5
CE44-027	750315.278	2083616.844	Naphthalene	1.600	0.980	3090000	NA	µg/kg	14.5	16.5
CE44-027	750315.278	2083616.844	Trichloroethene	1.300	0.990	19600	NA	µg/kg	14.5	16.5
CE44-027	750315.278	2083616.844	Trichloroethene	1.700	1.100	19600	NA	µg/kg	16.5	18.5
CE44-027	750315.278	2083616.844	Trichloroethene	1.200	1.100	19600	NA	µg/kg	18.5	20.5
CE44-027	750315.278	2083616.844	Uranium-238	1.790	NA	351	1.490	pCi/g	18.5	20.5
CE44-027	750315.278	2083616.844	Acetone	6.000	5.700	102000000	NA	µg/kg	20.5	22.0
CE44-027	750315.278	2083616.844	Naphthalene	1.300	1.100	3090000	NA	µg/kg	20.5	22.0
CE44-027	750315.278	2083616.844	Trichloroethene	3.900	1.100	19600	NA	µg/kg	20.5	22.0
CE44-028	750305.834	2083616.561	Acetone	16.000	5.700	102000000	NA	µg/kg	12.5	14.5
CE44-028	750305.834	2083616.561	Ethylbenzene	4.500	1.500	4250000	NA	µg/kg	12.5	14.5
CE44-028	750305.834	2083616.561	Toluene	36.000	0.960	31300000	NA	µg/kg	12.5	14.5
CE44-028	750305.834	2083616.561	Trichloroethene	1.900	1.100	19600	NA	µg/kg	12.5	14.5
CE44-028	750305.834	2083616.561	Xylene	16.000	3.400	2040000	NA	µg/kg	12.5	14.5
CE44-028	750305.834	2083616.561	Acetone	6.800	5.500	102000000	NA	µg/kg	14.5	16.5
CE44-028	750305.834	2083616.561	Uranium-238	1.800	NA	351	1.490	pCi/g	20.5	22.5
CE44-029	750291.230	2083613.054	Uranium-234	5.118	NA	300	2.640	pCi/g	12.5	14.5
CE44-029	750291.230	2083613.054	Uranium-235	0.362	NA	8	0.120	pCi/g	12.5	14.5
CE44-029	750291.230	2083613.054	Uranium-238	5.118	NA	351	1.490	pCi/g	12.5	14.5
CE44-029	750291.230	2083613.054	Uranium-234	4.994	NA	300	2.640	pCi/g	14.5	16.5
CE44-029	750291.230	2083613.054	Uranium-235	0.259	NA	8	0.120	pCi/g	14.5	16.5

Location	Northing	Easting	Analyte	Result	RL	WRW AL	Background Mean + 2 Standard Deviations	Unit	Start Depth (ft)	End Depth (ft)
CE44-029	750291.230	2083613.054	Uranium-238	4.994	NA	351	1.490	pCi/g	14.5	16.5
CE44-029	750291.230	2083613.054	Uranium-238	2.164	NA	351	1.490	pCi/g	18.8	20.0
CE44-029	750291.230	2083613.054	Trichloroethene	8.400	6.490	19600	NA	µg/kg	20.8	22.8
CE44-029	750291.230	2083613.054	Uranium-238	1.502	NA	351	1.490	pCi/g	20.8	22.8
CE44-031	750291.847	2083605.869	Uranium-238	1.566	NA	351	1.490	pCi/g	12.5	14.5
CE44-031	750291.847	2083605.869	Uranium-235	0.165	NA	8	0.120	pCi/g	16.5	18.5
CE44-031	750291.847	2083605.869	<i>Uranium-234</i>	5.674	NA	300	2.640	pCi/g	18.5	20.5
CE44-031	750291.847	2083605.869	Uranium-235	0.273	NA	8	0.120	pCi/g	18.5	20.5
CE44-031	750291.847	2083605.869	Uranium-238	5.674	NA	351	1.490	pCi/g	18.5	20.5
CE44-031	750291.847	2083605.869	<i>Uranium-234</i>	4.923	NA	300	2.640	pCi/g	20.5	22.5
CE44-031	750291.847	2083605.869	Uranium-235	0.259	NA	8	0.120	pCi/g	20.5	22.5
CE44-031	750291.847	2083605.869	Uranium-238	4.923	NA	351	1.490	pCi/g	20.5	22.5

pCi/kg = picocuries per kilogram

µg/kg = microgram per kilogram (may appear as ug/kg)

NA = not applicable

Italic font denotes result derived by calculation based on another analysis

Note that the sample from Location CE44-030 within the below-grade room was changed to an incidental water sample (Contact Record July 8, 2004, see Appendix A).

Because power had been cut off to Building 732, the sump pump was not functioning. Incidental water built up on the floor and in early July 2004 had backed up from the sump to approximately the bottom of the stairs and the southern half of the below-grade room (Figure 3). Because of the water covering the floor and the probability of groundwater flowing into the room should the sump be breached by coring, an incidental water sample was collected at Location CE44-030 from the sump. Soil samples were not collected at this location.

Sampling at Location CE44-029 was used for soil characterization adjacent to the sump (Contact Record July 8, 2004, see Appendix A). Soil collected at CE44-029 was from the same intervals as planned at CE44-030.

Results of the incidental water sampling are included on the data CD.

### 2.3 Accelerated Action Exceedances

All contaminants of concern (COC) concentrations in IHSS Group 700-10 soils were less than WRW ALs. Soil remediation was not required.

### 2.4 Sum of Ratios

Because all PAC 700-1101 samples were collected at depths greater than 3 feet below present ground surface, Rocky Flats Cleanup Agreement (RFCA) sums of ratios (SORs) are not shown.

### 2.5 Summary Statistics

Summary statistics, by analyte, were calculated for the IHSS Group 700-10 sampling locations, as presented in Table 4. These summaries are based on detections only. Because some radionuclide and VOC analytes were non-detections they are not represented here.

**Table 4**  
**IHSS Group 700-10 Subsurface Soil Summary Statistics**

Analyte	Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2 Standard Deviations	WRW AL	Unit
1,2,4-Trichlorobenzene	20	5.00%	0.850	0.850	NA	9230000	µg/kg
Acetone	20	15.00%	9.600	16.000	NA	102000000	µg/kg
Ethylbenzene	20	5.00%	4.500	4.500	NA	4250000	µg/kg
Naphthalene	20	10.00%	1.450	1.600	NA	3090000	µg/kg

Toluene	20	5.00%	36.000	36.000	NA	31300000	µg/kg
Trichloroethene	20	35.00%	3.100	8.400	NA	19600	µg/kg
Uranium-234	20	20.00%	5.177	5.674	2.64	300	pCi/g
Uranium-235	20	25.00%	0.264	0.362	0.12	8	pCi/g
Uranium-238	20	45.00%	3.281	5.674	1.49	351	pCi/g
Xylene	20	5.00%	16.000	16.000	NA	2040000	µg/kg

### 3.0 RCRA UNIT CLOSURE

Not applicable.

### 4.0 SUBSURFACE SOIL RISK SCREEN

The Subsurface Soil Risk Screen (SSRS) follows the steps identified in Figure 3 of Attachment 5 of RFCA (DOE et al. 2003

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

Yes. As shown in Table 3 (this document), all PAC 700-1101 subsurface soil results greater than background means plus two standard deviations or reporting limits were less than RFCA WRW ALs.

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

No. Contaminant migration via erosion and groundwater are two possible pathways whereby surface water could become contaminated by soil from PAC 700-1101. PAC 700-1101 is not located in an area subject to erosion as identified on Figure 1 of RFCA. In addition, because potential leaks from the PAC 700-1101 structure would be on the order of 10 to 12 ft below the current ground surface, erosion would be unlikely. Currently, runoff from PAC 700-1101 and a large part of the 700 Area is monitored at surface water monitoring location GS40. Downstream from GS40, surface water monitoring location GS10 is the RFCA surface water Point of Evaluation (POE). Although exceedances of surface water ALs have been detected at GS10, this station receives water from a large part of the IA. Therefore, surface water quality at GS10 is not attributable to any single IHSS Group such as 700-10, PAC 700-1101 (DOE 2002a, 2003). The RFETS Automated Surface-Water Monitoring Report - Water Year 2002 (DOE 2003) indicates that GS40 contributed a significant portion of the americium-241 and plutonium-239/240 load measured at GS10 between March 2002 and November 2003. Because americium-241 and plutonium-239/240 were less than background in PAC 700-1101 samples, they are not COCs, and soil from PAC 700-1101 should not pose a danger to surface water. Surface water issues will be addressed in the CRA.

Groundwater in the vicinity of IHSS Group 700-10 is monitored at well locations 60299 and 60399. From the beginning of 2000 through the end of 2003 trichloroethene

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concentrations increased to levels above Tier II ALs in groundwater at well 60299. The 2001 RFCA Annual Groundwater Monitoring Report (DOE 2002b) concluded that the VOC contamination in the PAC 700-1101 area is part of the IA Plume and that well 60299 lays on the eastern edge of the IA Plume. Small amounts of trichloroethene detected in soil samples and a water-level above the floor within Building 732 suggest that PAC 700-1101 is not a source of VOCs. Nitrite was also present in ground water samples collected in November 2000 (5.5 milligrams per liter [mg/L]) and May 2001 (7.2 mg/L) from 60299. These concentrations exceeded the Tier II AL (1 mg/L) but are less than the Tier I AL. More recently, late 2002 and 2003, well 60299 has been dry. Nitrite was not one of the analytes examined in this soil characterization project. Groundwater will be addressed in the groundwater Interim Measure/Interim Remedial Action (IM/IRA).

## **5.0 NO FURTHER ACCELERATED ACTION SUMMARY**

Based on the analytical results and the SSRS, action is not required, and an NFAA determination is justified for IHSS Group 700-10, PAC 700-1101, because of the following:

- Contaminant concentrations were less than WRW ALs.
- Migration of contaminants to surface water through erosion is unlikely because the area is not in an area prone to landslides or erosion and because potential contamination would be on the order of 10 to 12 ft below ground surface.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS Group 700-10. The groundwater is considered part of the IA Plume, which will be further evaluated in the Groundwater IM/IRA.

## **6.0 DATA QUALITY ASSESSMENT**

The data quality objectives (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-04-07 (DOE 2004);
- Samples collected in accordance with the IASAP (DOE 2001); and
- Data Quality Assessment (DQA) conducted as documented in the following sections.

Note that the DQA process will not be applied to the incidental water samples collected at location CE44-030. QC results for CE44-030 water; gamma spectroscopy, VOCs (SW-846 8260), and metals (SW-846 6010) analyses; do not appear in Section 6.0 and will not be evaluated. These data will be included in the data CD.

## **6.1 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
- U.S. Department of Energy (DOE), 1999, *Quality Assurance, Order 414.1A*.

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

- EPA, 1994b, U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012;
- EPA, 1994c, U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013;
- Kaiser-Hill Company, L.L.C. (K-H) V&V Guidelines:
  - General Guidelines for Data Verification and Validation, DA-GR01-v2, 2002a
  - V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, 2002b
  - V&V Guidelines for Volatile Organics, DA-SS01-v3, 2002c
  - V&V Guidelines for Semivolatile Organics, DA-SS02-v3, 2002d
  - V&V Guidelines for Metals, DA-SS05-v3, 2002e; 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 (CERCLA) Administrative Record (AR) for permanent storage 30 days after being provided to CDPHE and/or EPA.

## **6.2 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 (that is, within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation “flags” or qualifiers to individual records.

Raw, hard-copy data (for example, individual analytical data packages) are currently filed by report identification number (RIN) and maintained by K-H Analytical Services Division (ASD); older hard copies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS Soil Water Database (SWD). The data sets addressed in this report are included on the enclosed compact disc in Microsoft Access 2000 format.

### **6.2.1 Accuracy**

The following measures of accuracy were evaluated:

- LCSs;
- Surrogates;
- Field blanks; and
- Sample MSs.

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 frequencies of LCS measurements are presented in Table 5. As indicated in Table 5 LCS analyses were run for alpha spectrometry and SW-846 8260 (VOCs). The onsite laboratories are not required to provide gamma spectroscopy LCS data.

**Table 5  
LCS Summary**

Test Method	Lab Batch	Laboratory Control Standards
Alpha Spectrometry	4216498	Yes
Alpha Spectrometry	4216499	Yes
Alpha Spectrometry	4216500	Yes
Alpha Spectrometry	4219331	Yes
Alpha Spectrometry	4219344	Yes
Alpha Spectrometry	4219356	Yes
SW-846 8260	4217265	Yes
SW-846 8260	4218570	Yes
SW-846 8260	4219154	Yes
SW-846 8260	MS1 VOA 040728A	Yes
SW-846 8260	MS2 VOA 040727A	Yes
SW-846 8260	MS3 VOA 040727A	Yes

Minimum and maximum LCS results are tabulated by chemical for the entire project in Table 6. LCS results that were outside of tolerances were reviewed to determine whether a potential bias might be indicated. LCS recoveries are not indicative of matrix effects because they are not prepared using Site samples. LCS results do indicate whether the laboratory may be introducing a bias in the results. Recoveries reported above the upper limit may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed.

Potentially unacceptable low LCS recoveries were evaluated in the following manner. If the maximum sample result divided by the lowest LCS recovery for that analyte is less than the WRW AL, no further action is taken because any indicated bias is not great enough to correct a false low result to one above the AL. All soil VOC LCS recoveries for IHSS Group 700-10 passed the criterion, and therefore, LCS recoveries did not impact project decisions.

Any qualifications of individual results because of LCS performance exceeding upper or lower tolerance limits are also captured in the V&V flags, described in Section 6.2.3.

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**Table 6**  
**LCS Evaluation Summary**

Test Method	CAS No.	Analyte	Minimum Result	Maximum Result	Unit
SW-846 8260	71-55-6	1,1,1-Trichloroethane	89.72	115	%REC
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	92.94	111	%REC
SW-846 8260	79-00-5	1,1,2-Trichloroethane	93.58	112	%REC
SW-846 8260	75-34-3	1,1-Dichloroethane	87.63	105	%REC
SW-846 8260	75-35-4	1,1-Dichloroethene	90.35	108.9	%REC
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	87.8	116	%REC
SW-846 8260	95-50-1	1,2-Dichlorobenzene	93.21	109	%REC
SW-846 8260	107-06-2	1,2-Dichloroethane	88.84	121	%REC
SW-846 8260	78-87-5	1,2-Dichloropropane	86.63	103.3	%REC
SW-846 8260	106-46-7	1,4-Dichlorobenzene	89	104	%REC
SW-846 8260	78-93-3	2-Butanone	69.44	121	%REC
SW-846 8260	108-10-1	4-Methyl-2-pentanone	84.82	121	%REC
SW-846 8260	67-64-1	Acetone	66.89	130	%REC
SW-846 8260	71-43-2	Benzene	89.96	105	%REC
SW-846 8260	75-27-4	Bromodichloromethane	86.97	114	%REC
SW-846 8260	75-25-2	Bromoform	78.79	125	%REC
SW-846 8260	74-83-9	Bromomethane	63.11	93	%REC
SW-846 8260	75-15-0	Carbon Disulfide	69	127.6	%REC
SW-846 8260	56-23-5	Carbon Tetrachloride	86.46	116	%REC
SW-846 8260	108-90-7	Chlorobenzene	94.16	106	%REC
SW-846 8260	75-00-3	Chloroethane	84	102.9	%REC
SW-846 8260	67-66-3	Chloroform	87.6	114	%REC
SW-846 8260	74-87-3	Chloromethane	71	105.4	%REC
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	84.3	111	%REC
SW-846 8260	124-48-1	Dibromochloromethane	93.27	120	%REC
SW-846 8260	100-41-4	Ethylbenzene	94	107	%REC
SW-846 8260	87-68-3	Hexachlorobutadiene	80.23	118	%REC
SW-846 8260	75-09-2	Methylene chloride	81.89	110	%REC
SW-846 8260	91-20-3	Naphthalene	93.09	113	%REC
SW-846 8260	100-42-5	Styrene	93.35	108	%REC
SW-846 8260	127-18-4	Tetrachloroethene	88.4	108	%REC
SW-846 8260	108-88-3	Toluene	93	105	%REC
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	102.5	119	%REC
SW-846 8260	79-01-6	Trichloroethene	87.67	106	%REC
SW-846 8260	75-01-4	Vinyl chloride	76	107.6	%REC
SW-846 8260	1330-20-7	Xylene	92.42	107	%REC

**Surrogate Evaluation**

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 7. The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project. Surrogates are added to every VOC sample, and, therefore, surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential matrix effects. Surrogate recoveries reported above 100 percent may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed. Therefore, only the lowest recoveries were evaluated. If the maximum sample result divided by the lowest surrogate recovery is less than the WRW AL for that analyte, no further action is taken because any indicated bias is not great enough to affect project decisions. All VOC analytes passed this criterion. Therefore, for IHSS Group 700-10 surrogate recoveries did not impact project decisions.

**Table 7  
Surrogate Recovery Summary**

Volatile Organic Compounds					
Number of Samples	CAS No.	Analyte	Minimum	Maximum	Result Unit
20	460-00-4	4-Bromofluorobenzene	89.68	124	%REC
20	17060-07-0	Deuterated 1,2-dichloroethane	96.89	121	%REC
20	2037-26-5	Deuterated Toluene	88	110	%REC

**Field Blank Evaluation**

Results of the field blank analyses are provided in Table 8. Detectable (non-"U" laboratory qualified) 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. Evaluation consists of multiplying the field blank results by 10 (for laboratory contaminants) or by 5 (for non-laboratory contaminants). To be conservative a factor of 10 is used in this evaluation. If the analyte is also present in the real sample, the analyte is evaluated to determine if blank contamination could affect results. Blank contamination did not adversely impact project decisions.

**Table 8  
Field Blank Summary**

Sample QC Code	Laboratory	CAS No.	Analyte	Detected Result	Unit
EB	URS	15117-96-1	Uranium-235	0.124	pCi/g
EB	URS	7440-61-1	Uranium-238	1.710	pCi/g
FB	URS	15117-96-1	Uranium-235	0.174	pCi/g
FB	URS	7440-61-1	Uranium-238	2.510	pCi/g
RNS	URS	15117-96-1	Uranium-235	0.173	pCi/g

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Sample QC Code	Laboratory	CAS No.	Analyte	Detected Result	Unit
RNS	URS	7440-61-1	Uranium-238	1.940	pCi/g

### Sample Matrix Spike Evaluation

Table 9 provides a summary of the minimum and maximum MS results by chemical for the project. According to the EPA data validation guidelines (1994b), if organic MS recoveries are low, then the LCS recovery should be checked. If the recovery is acceptable, no action is taken. LCS recoveries for organic analyses with potentially low unacceptable MS recoveries were reviewed. For this project, these checks indicate no decisions were impacted for organic analytes with low MS recoveries (refer to previous section).

**Table 9**  
**Sample MS Evaluation Summary**

Test Method	CAS No.	Analyte	Minimum Result	Maximum Result	Unit	Number of MS Samples	Number of Laboratory Batches
SW-846 8260	71-55-6	1,1,1-Trichloroethane	94.42	118	%REC	6	6
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	88.55	107.1	%REC	6	6
SW-846 8260	79-00-5	1,1,2-Trichloroethane	94.09	110	%REC	6	6
SW-846 8260	75-34-3	1,1-Dichloroethane	86	111.5	%REC	6	6
SW-846 8260	75-35-4	1,1-Dichloroethene	86	104.9	%REC	6	6
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	76	94	%REC	6	6
SW-846 8260	95-50-1	1,2-Dichlorobenzene	82	99.28	%REC	6	6
SW-846 8260	107-06-2	1,2-Dichloroethane	89.61	127	%REC	6	6
SW-846 8260	78-87-5	1,2-Dichloropropane	83	113	%REC	6	6
SW-846 8260	106-46-7	1,4-Dichlorobenzene	82	97.6	%REC	6	6
SW-846 8260	78-93-3	2-Butanone	82.25	127.5	%REC	6	6
SW-846 8260	108-10-1	4-Methyl-2-pentanone	71.17	122	%REC	6	6
SW-846 8260	67-64-1	Acetone	78.79	132	%REC	6	6
SW-846 8260	71-43-2	Benzene	85	106.6	%REC	6	6
SW-846 8260	75-27-4	Bromodichloromethane	94.71	119	%REC	6	6
SW-846 8260	75-25-2	Bromoform	100.2	129	%REC	6	6
SW-846 8260	74-83-9	Bromomethane	82	140.8	%REC	6	6
SW-846 8260	75-15-0	Carbon Disulfide	64	88.83	%REC	6	6
SW-846 8260	56-23-5	Carbon Tetrachloride	95	118	%REC	6	6
SW-846 8260	108-90-7	Chlorobenzene	84	101.1	%REC	6	6
SW-846 8260	75-00-3	Chloroethane	76	109.1	%REC	6	6
SW-846 8260	67-66-3	Chloroform	96	119	%REC	6	6
SW-846 8260	74-87-3	Chloromethane	75	112.6	%REC	6	6
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	89.47	113	%REC	6	6
SW-846 8260	124-48-1	Dibromochloromethane	98.64	120	%REC	6	6

Test Method	CAS No.	Analyte	Minimum Result	Maximum Result	Unit	Number of MS Samples	Number of Laboratory Batches
SW-846 8260	100-41-4	Ethylbenzene	83	101	%REC	6	6
SW-846 8260	87-68-3	Hexachlorobutadiene	77	104.3	%REC	6	6
SW-846 8260	75-09-2	Methylene chloride	87	108	%REC	6	6
SW-846 8260	91-20-3	Naphthalene	85.48	102	%REC	6	6
SW-846 8260	100-42-5	Styrene	85	104	%REC	6	6
SW-846 8260	127-18-4	Tetrachloroethene	83	106	%REC	6	6
SW-846 8260	108-88-3	Toluene	81	99.3	%REC	6	6
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	85.86	119	%REC	6	6
SW-846 8260	79-01-6	Trichloroethene	84	112.1	%REC	6	6
SW-846 8260	75-01-4	Vinyl chloride	73	102.8	%REC	6	6
SW-846 8260	1330-20-7	Xylene	83	102.8	%REC	6	6

### 6.2.2 Precision

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

#### *Matrix Spike Duplicate Evaluation*

Laboratory precision is measured through the use of MSDs, as summarized in Table 10. MSD evaluation consists of reviewing analytes with the highest relative percent differences (RPDs) (greater than 35 percent) by comparing the highest sample result to the WRW AL. None of the MSD-RPDs from IHSS Group 700-10 are greater than 35 percent, and therefore, no further action is needed.

**Table 10**  
**Sample MSD Evaluation Summary**

Test Method	CAS NO.	Analyte	Maximum RPD
SW-846 8260	71-55-6	1,1,1-Trichloroethane	23.70
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	20.32
SW-846 8260	79-00-5	1,1,2-Trichloroethane	20.00
SW-846 8260	75-34-3	1,1-Dichloroethane	27.32
SW-846 8260	75-35-4	1,1-Dichloroethene	16.04
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	30.67
SW-846 8260	95-50-1	1,2-Dichlorobenzene	30.59
SW-846 8260	107-06-2	1,2-Dichloroethane	29.86
SW-846 8260	78-87-5	1,2-Dichloropropane	23.46
SW-846 8260	106-46-7	1,4-Dichlorobenzene	28.57
SW-846 8260	78-93-3	2-Butanone	27.78
SW-846 8260	108-10-1	4-Methyl-2-pentanone	32.06

Test Method	CAS NO.	Analyte	Maximum RPD
SW-846 8260	67-64-1	Acetone	27.58
SW-846 8260	71-43-2	Benzene	23.46
SW-846 8260	75-27-4	Bromodichloromethane	26.67
SW-846 8260	75-25-2	Bromoform	24.35
SW-846 8260	74-83-9	Bromomethane	16.95
SW-846 8260	75-15-0	Carbon Disulfide	18.18
SW-846 8260	56-23-5	Carbon Tetrachloride	23.70
SW-846 8260	108-90-7	Chlorobenzene	23.20
SW-846 8260	75-00-3	Chloroethane	22.75
SW-846 8260	67-66-3	Chloroform	27.75
SW-846 8260	74-87-3	Chloromethane	19.28
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	28.28
SW-846 8260	124-48-1	Dibromochloromethane	22.22
SW-846 8260	100-41-4	Ethylbenzene	24.44
SW-846 8260	87-68-3	Hexachlorobutadiene	34.15
SW-846 8260	75-09-2	Methylene chloride	33.71
SW-846 8260	91-20-3	Naphthalene	25.41
SW-846 8260	100-42-5	Styrene	23.66
SW-846 8260	127-18-4	Tetrachloroethene	20.77
SW-846 8260	108-88-3	Toluene	21.71
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	24.53
SW-846 8260	79-01-6	Trichloroethene	28.89
SW-846 8260	75-01-4	Vinyl chloride	17.07
SW-846 8260	1330-20-7	Xylene	22.95

### Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Table 11 indicates that sampling frequencies were adequate with respect to all analytical methods.

**Table 11**  
**Field Duplicate Sample Frequency Summary**

Test Method	Number of Real Samples	Number of Duplicate Samples	% Duplicate Samples
ALPHA SPEC	10	5	50.00%
GAMMA SPECTROSCOPY	20	5	25.00%
SW-846 8260	20	5	25.00%

Duplicate sample RPDs indicate how much variation exists in the field duplicate analyses; duplicate sample RPDs are provided in Table 12. RPDs for analytes are only shown in Table 12 if the analyte was present at 5 or more times the detection limit. The EPA data validation guidelines state that “there are no required review criteria for field duplicate analyses comparability” (EPA 1994b). For the DQA, the highest maximum RPDs (greater than 35 percent) are normally reviewed. For IHSS Group 700-10 no RPDs were greater than 35 percent and therefore, RPDs did not affect project decisions.

**Table 12**  
**RPD Evaluation Summary**

Lab Code	Test Method	Analyte	Maximum RPD (%)
ESTLDEN	SW-846 8260	1,1,1-Trichloroethane	3.125
ESTLDEN	SW-846 8260	1,1-Dichloroethane	3.125
ESTLDEN	SW-846 8260	1,2,4-Trichlorobenzene	3.125
ESTLDEN	SW-846 8260	1,2-Dichloroethane	3.125
ESTLDEN	SW-846 8260	4-Methyl-2-pentanone	4.082
ESTLDEN	SW-846 8260	Benzene	3.125
ESTLDEN	SW-846 8260	Bromodichloromethane	3.125
ESTLDEN	SW-846 8260	Bromoform	3.125
ESTLDEN	SW-846 8260	Carbon Disulfide	3.125
ESTLDEN	SW-846 8260	Chlorobenzene	3.125
ESTLDEN	SW-846 8260	Chloroform	3.125
ESTLDEN	SW-846 8260	cis-1,3-Dichloropropene	3.125
ESTLDEN	SW-846 8260	Dibromochloromethane	3.125
ESTLDEN	SW-846 8260	Methylene chloride	3.125
ESTLDEN	SW-846 8260	Naphthalene	3.125
ESTLDEN	SW-846 8260	Styrene	3.125
ESTLDEN	SW-846 8260	Tetrachloroethene	3.125
ESTLDEN	SW-846 8260	Toluene	3.125
ESTLDEN	SW-846 8260	trans-1,3-Dichloropropene	0.000

### 6.2.3 Completeness

Based on the original program 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 13 presents the number and percentage of validated records (codes without “1”) (in this case no records were validated), the number and percentage of verified records (codes with “1”), and the percentage of rejected records (none for the IHSS Group 700-10 project) for each analyte group. While no records were validated for this project the frequency of verification and lack of rejected records are within project quality requirements. In

addition, association with previous and subsequent validated records indicates that project data are adequate.

**Table 13**  
**V&V Summary**

Validation Qualifier Code	Total of CAS Number	Alpha Spectroscopy	Gamma Spectroscopy	SW-846 8260
JB1	2	0	0	2
UJ1	43	0	0	43
V1	1145	50	60	1035
Total	1190	50	60	1080
Verified	1190	50	60	1080
% Verified	100.00%	100.00%	100.00%	100.00%

Validation qualifiers: J = Estimated, JB = Estimated with possible laboratory contamination, R = Rejected, UJ = Estimated detection limit, V = Validated

Verification qualifiers: J1 = Estimated, JB1 = Estimated with possible laboratory contamination, R1 = Rejected, UJ1 = Estimated detection limit, V1 = Verified

#### 6.2.4 Sensitivity

RLs, in units of micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) for organics and picocuries per gram ( $\text{pCi}/\text{g}$ ) for radionuclides, were compared with RFCA ALs. Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions. "Adequate" sensitivity is defined as an RL less than an analyte's associated AL, typically less than one-half the AL.

#### 6.3 Summary of Data Quality

LCS corrections of maximum results indicate no project decisions were impacted. Surrogate recoveries and field blank analyses are acceptable. Corrections for LCS, MS, and MSD recoveries indicate that results did not impact project decisions.

The frequency of field duplicates is adequate. No records were rejected. Compliance with the project quality requirements and RFETS validation and verification goals for analytical records were met indicating these data are adequate.

Data collected and used for IHSS Group 700-10, PAC 700-1101, are adequate for decision making.

#### 7.0 PROJECT CONCLUSIONS

Results of the accelerated action justify an NFAA determination for IHSS Group 700-10, PAC 700-1101. This justification is based on the following:

- Accelerated action sampling results were less than WRW ALs.

- NFAA is appropriate based on the SSRS.

## **8.0 REFERENCES**

- DOE, 1992-2003, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.
- DOE, 1999, U.S. Department of Energy, Quality Assurance, Order 414.1A.
- DOE, 2000, Rocky Flats Environmental Technology Site Industrial Area Data Summary Report, Golden, Colorado, September.
- DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.
- DOE, 2002a, Rocky Flats Environmental Technology Site Automated Surface-Water Monitoring Report - Water Years 1997-2000, Rocky Flats Environmental Technology Site, Golden, Colorado, September.
- DOE, 2002b, Final 2001 Annual Rocky Flats Cleanup Agreement (RFCA) Groundwater Monitoring Report for the Rocky Flats Environmental Technology Site, Golden, Colorado, November.
- DOE, 2003, Rocky Flats Environmental Technology Site Automated Surface-Water Monitoring Report - Water Year 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, November.
- DOE, 2004, Industrial Area Sampling and Analysis Plan Addendum #IA-04-07, IHSS Group 700-10, PAC 700-1101 (Laundry Tank Overflow – Building 732), Rocky Flats Environmental Technology Site, Golden, Colorado, January.
- DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.
- EPA, 1994a, Guidance for the Data Quality Objective Process, QA/G-4.
- EPA, 1994b, U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012.
- EPA, 1994c, U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013.
- EPA, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis, QA/G-9.
- K-H, 2002a, General Guidelines for Data Verification and Validation, DA-GR01-v2, October.
- K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, October.
- K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v3, October.

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

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

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

**APPENDIX A**  
Correspondence

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE  
ER REGULATORY CONTACT RECORD

**Date/Time:** July 8, 2004 / 1000 am

**Site Contact(s):** Annette Primrose  
**Phone:** 303 966-4385  
**Regulatory Contact:** Harlen Ainscough  
**Phone:** 303 692-3337  
**Agency:** CDPHE

**Purpose of Contact:** Modifications to the 700-10 SAP

**Discussion**

As discussed and agreed to, location CE44-030 is located inside Building 732 at the sump in the southeast corner of the building. The sump is too small for personnel entry and sampling and is located immediately adjacent to the outer walls of the building. CE44-029 is located outside of the building at this same location and the same intervals proposed for the sump samples will be collected here.

In addition, the sump and part of the surrounding floor was filled with water, indicating that the water level surrounding this building was higher than the floor. As seen at other locations, when the floor is cored, water is anticipated to come into the building, generally preventing all but groundwater sample collection. Because the sump is already filled with groundwater, sample CE44-030 will be changed to a groundwater sample collected from the sump.

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Sherry Lopez, K-H RISS  
Sam Garcia, USEPA

**ENCLOSURE**

Compact Disc Containing Complete Data Set

IHSS Group 700-10

PAC 700-1101

Laundry Tank Overflow – Building 732

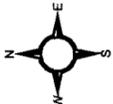
34  
34

**FIGURE 1**

**IHSS Group 700-10  
PAC 700-1101  
General Location**

**KEY**

-  IHSSs surrounding PAC 700-1101
-  Building demolished
-  Building standing
-  Pond
-  Paved Road
-  Dirt Road
-  Trail
-  Fence
-  Railroad
-  Streams or surface drainage



200 0 200 400 600 800 Feet  
Scale = 1:6000  
State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

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

Prepared by:

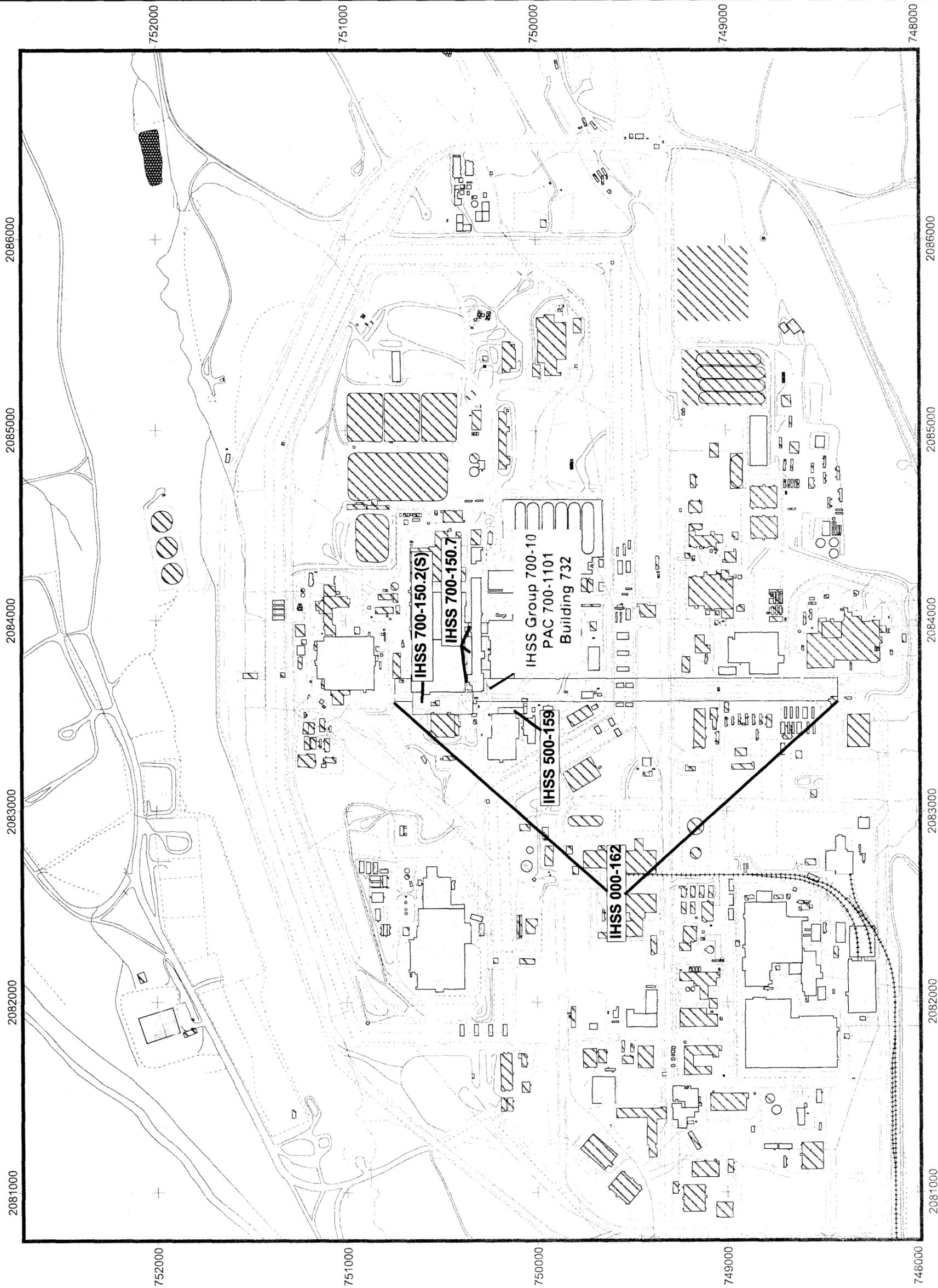


Prepared for:



Date: 8/24/04

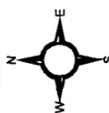
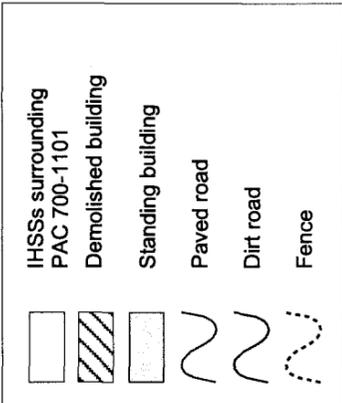
File: W:\Projects\Fy2004\700-10\700-10\_dsr.apr



**FIGURE 2**

**IHSS Group 700-10  
PAC 700-1101  
Detailed Location**

**KEY**



Scale = 1:250

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

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

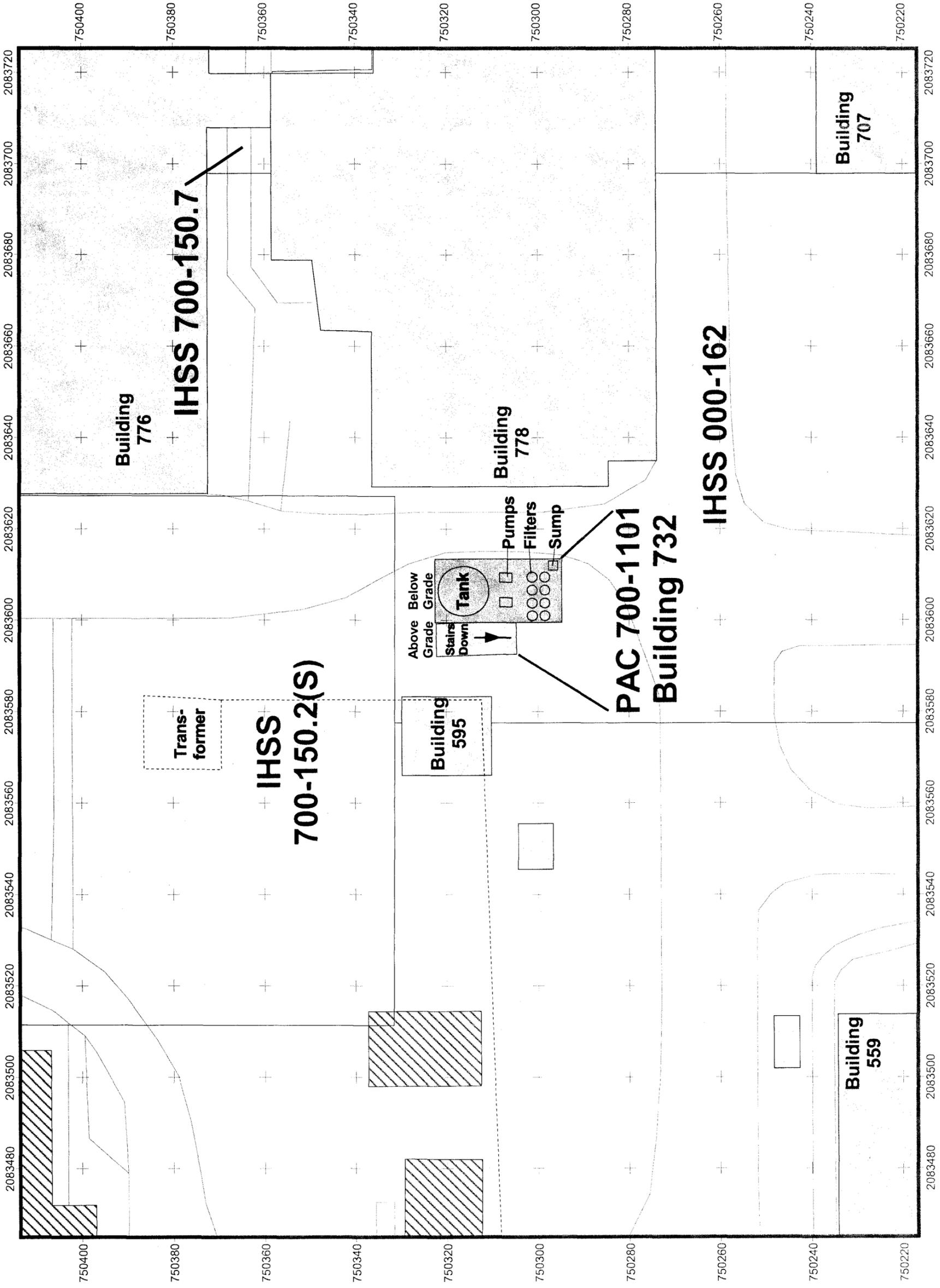
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Prepared by:



Date: 8/24/04  
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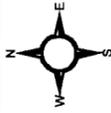


**FIGURE 3**

**IHSS Group 700-10  
Accelerated Action  
Subsurface Soil Sampling Results  
Greater Than Background Means  
Plus Two Standard Deviations  
or Reporting Limits**

**KEY**

- Soil sample location with result greater than Background or RLs and less than WRW ALs
- ▲ Incidental water sample location
- IHSS
- Building demolished
- Building standing
- Paved road



Scale = 1:50

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

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

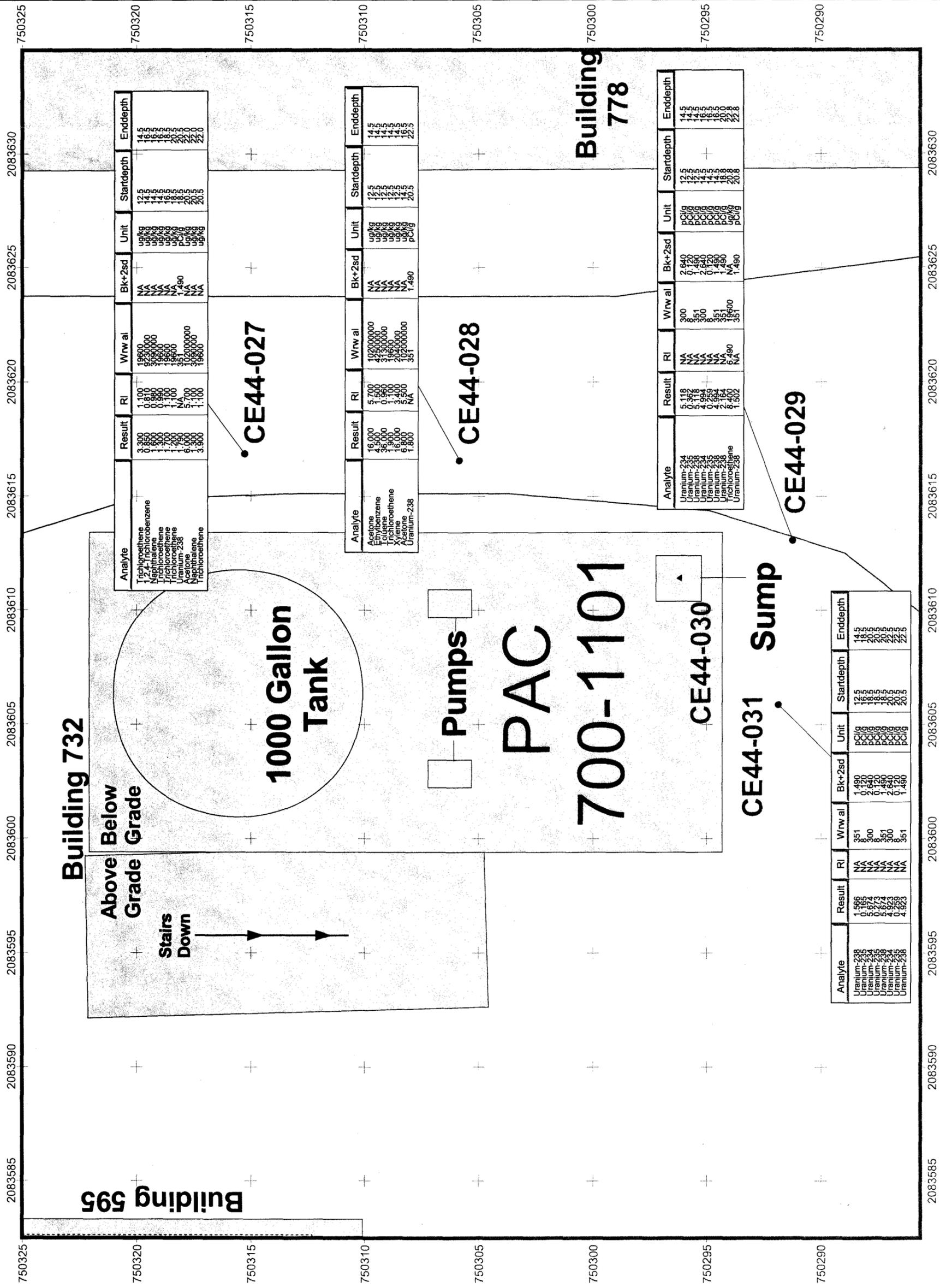
Prepared for:



Prepared by:



Date: 8/24/04  
File: W:\Projects\FY2004\700-10\700-10\_dsr.apr



Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Startdepth	Enddepth
Trichloroethene	3.300	1.100	19500	NA	ug/kg	12.5	14.5
1,2-Dichlorobenzene	0.350	0.870	92500000	NA	ug/kg	14.5	16.5
Naphthalene	1.600	0.980	30900000	NA	ug/kg	14.5	16.5
Trichloroethene	1.300	0.980	19500	NA	ug/kg	14.5	16.5
Trichloroethene	1.700	1.100	19500	NA	ug/kg	18.5	20.5
Uranium-238	1.750	3.51	102000000	1.490	pCi/g	20.5	22.5
Acetone	6.000	5.700	102000000	NA	ug/kg	20.5	22.5
Naphthalene	3.300	1.100	30900000	NA	ug/kg	20.5	22.5
Trichloroethene	3.300	1.100	19500	NA	ug/kg	20.5	22.5

• **CE44-027**

Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Startdepth	Enddepth
Acetone	16.000	5.700	102000000	NA	ug/kg	12.5	14.5
Ethylbenzene	4.500	1.500	42500000	NA	ug/kg	12.5	14.5
Toluene	3.900	1.950	19500000	NA	ug/kg	12.5	14.5
Xylene	16.000	3.400	20400000	NA	ug/kg	12.5	14.5
Acetone	6.800	5.500	102000000	1.490	pCi/g	12.5	14.5
Uranium-238	1.800	NA	351	NA	pCi/g	20.5	22.5

• **CE44-028**

Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Startdepth	Enddepth
Uranium-234	5.118	NA	300	2.640	pCi/g	12.5	14.5
Uranium-235	0.362	NA	8.51	0.120	pCi/g	12.5	14.5
Uranium-238	3.994	NA	300	2.640	pCi/g	12.5	14.5
Uranium-235	0.259	NA	8.51	0.120	pCi/g	14.5	16.5
Uranium-238	4.984	NA	351	1.490	pCi/g	14.5	16.5
Uranium-238	2.164	NA	351	1.490	pCi/g	16.5	18.5
Uranium-238	1.502	NA	351	1.490	pCi/g	20.8	22.8

• **CE44-029**

Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Startdepth	Enddepth
Uranium-238	1.566	NA	351	1.490	pCi/g	12.5	14.5
Uranium-235	0.165	NA	8.00	0.120	pCi/g	12.5	14.5
Uranium-238	0.974	NA	351	1.490	pCi/g	14.5	16.5
Uranium-234	5.674	NA	300	2.640	pCi/g	14.5	16.5
Uranium-238	4.923	NA	351	1.490	pCi/g	16.5	18.5
Uranium-238	0.923	NA	351	1.490	pCi/g	20.5	22.5

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