

# **NOTICE**

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

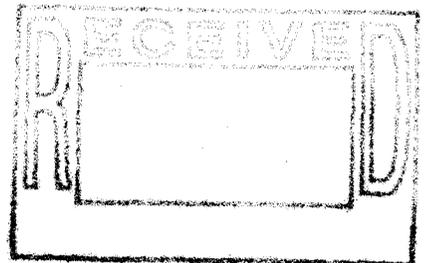
**Draft Data Summary Report  
IHSS Group 700-1**

**PAC 700-1115 – Identification of  
Diesel Fuel in Subsurface Soil**

Approval received from the Colorado Department of Public Health and Environment

( ).

Approval letter contained in the Administrative Record.



**August 2004**

ADMIN RECORD

IA-A-002260

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**ENCLOSURE**

Compact Disc Containing Standardized Real and Quality Control Data

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## ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
AR	Administrative Record
ASD	Analytical Services Division
CAS	Chemical Abstract 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
ER	Environmental Restoration
ft	Foot or feet
FY	Fiscal Year
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
K-H	Kaiser-Hill Company, L.L.C.
LCS	laboratory control sample
ug/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
NFAA	No Further Accelerated Action
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
QC	quality control
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
SWD	Soil Water Database
V&V	verification and validation
VOC	volatile organic compound
WRW	wildlife refuge worker

## **1.0 INTRODUCTION**

This Data Summary Report summarizes accelerated action characterization conducted at Individual Hazardous Substance Site (IHSS) Group 700-1 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. These activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) (DOE 2001) and IASAP Addendum #IA-04-15 (DOE 2004). Results are compared to wildlife refuge worker (WRW) action levels (ALs) described in the Rocky Flats Cleanup Agreement (RFCA) (DOE et al. 2003). Potential ecological risk associated with the results will be evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and the ecological portion of the Sitewide Comprehensive Risk Assessment (CRA). The location of IHSS Group 700-1 is shown on Figure 1.

This IHSS Group consists of one Potential Area of Concern (PAC):

- PAC 700-1115 – Identification of Diesel Fuel in Subsurface Soil.

Approval of this Data Summary Report constitutes regulatory agency concurrence that IHSS Group 700-1 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 Report (HRR).

## **2.0 SITE CHARACTERIZATION**

IHSS Group 700-1 information consists of historical knowledge (DOE 1992), historical sampling data, and recent sampling data. Historical information and data are summarized in Section 2.1. Characterization data collected in accordance with IASAP Addendum #IA-04-15 (DOE 2004) are presented in Section 2.2.

### **2.1 Historical Information and Data**

PAC 700-1115 was identified as a subsurface diesel fuel spill of unknown origin. Diesel fuel was observed in the soil from a 2-ft deep trench dug near the northeastern corner of Building 708 on May 31, 1997 (DOE 1997). Therefore, the contaminants of concern (COCs) identified for this PAC are volatile organic compounds (VOCs). Existing information and data for this PAC are available in Appendix C of the IASAP (DOE 2001), the HRR (DOE 1992), and the IA Data Summary Report (DOE 2000).

### **2.2 Accelerated Action Characterization Data**

Accelerated action characterization of IHSS Group 700-1 included 6 sampling locations. Sampling and analysis specifications for these locations were described in IASAP Addendum #IA-04-15 (DOE 2004). A summary of planned and actual sampling and analysis, as well as additional sampling and analysis, is presented in Table 1. Deviations from the IASAP Addendum specifications are summarized in Table 2.

**Table 1**  
**IHSS Group 700-1 Sampling and Analysis Summary**

IHSS Group	Category	Planned Total	Actual Total
700-1	Number of Sampling Locations	6	6
	Number of Samples	12	12
	Number of VOC Analyses	12	12

**Table 2**  
**IHSS Group 700-1 Characterization Sampling Deviations**

PAC Site	Location	Proposed Northing	Proposed Easting	Actual Northing	Actual Easting	Media	Actual Depth (ft)	Actual Analyte	Comments
700-1115	CF41-000	749727.183	2083865.447	749727.231	2083865.462	Subsurface soil	0.5 - 2.5	VOCs	No significant deviations to sampling specifications.
						Subsurface soil	2.5 - 4.5	VOCs	
	CF41-001	749726.955	2083913.434	749729.232	2083913.286	Subsurface soil	0.5 - 2.5	VOCs	Field located to target storm sewer line. No deviations to interval depth.
						Subsurface soil	2.5 - 4.5	VOCs	
	CF41-002	749708.193	2083887.221	749708.189	2083887.144	Subsurface soil	0.5 - 2.5	VOCs	Field located to target storm sewer line. No deviations to interval depth.
						Subsurface soil	2.5 - 4.5	VOCs	
	CF41-003	749690.621	2083914.233	749696.203	2083901.126	Subsurface soil	0.5 - 2.5	VOCs	An AST is located in this area. Sample location was moved due to access around the AST. No deviations to interval depth.
						Subsurface soil	2.5 - 4.5	VOCs	
	CF41-004	749689.354	2083887.236	749689.395	2083887.136	Subsurface soil	0.5 - 2.5	VOCs	No significant deviations to sampling specifications.
						Subsurface soil	2.5 - 4.5	VOCs	
	CF41-005	749668.227	2083887.041	749668.219	2083887.072	Subsurface soil	0.5 - 2.5	VOCs	No significant deviations to sampling specifications.
						Subsurface soil	2.5 - 4.5	VOCs	

As summarized in Section 2.1, PAC 700-1115 was identified as a subsurface diesel fuel spill of unknown origin. Additionally, a storm sewer line is located within the PAC boundary. Five sampling locations were placed along the length of the storm sewer line, targeting the fill material used in the placement of the line as a potential conduit for the contamination at the outer perimeter of the PAC boundary. One sample was placed near the center of the PAC for characterization of the central area. All samples were analyzed for VOCs.

No VOCs were detected at any of the sampling locations for IHSS Group 700-1. Figure 2 shows IHSS 700-1 sampling locations.

The data, retrieved from the RFETS Soil Water Database (SWD), are provided on the enclosed compact disc (CD). The CD contains standardized real and quality control (QC) data, including Chemical Abstract Service (CAS) numbers, analyte names, and units.

### **2.3 Sum of Ratios**

RFCA sum of ratios (SORs) were not calculated for radionuclides because only VOC analysis was performed for IHSS Group 700-1. Surface soil SORs for non-radionuclides were not calculated because only subsurface soils were collected for this IHSS group. Subsurface soil SORs for non-radionuclides were not calculated because subsurface soil concentrations are evaluated as part of the Subsurface Soil Risk Screen (SSRS) in Section 3.0.

### **2.4 Summary Statistics**

Summary statistics for analytes detected above background means plus two standard deviations or reporting limits (RLs) are not presented in this report as no VOCs were detected in any of the sample locations for IHSS Group 700-1.

## **3.0 SUBSURFACE SOIL RISK SCREEN**

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

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

Yes. No VOCs were detected in any of the sample locations for IHSS Group 700-1.

### **Screen 2 – Is there a potential for subsurface soil to become surface soil (landslide and erosion areas identified on Figure 1)?**

No. Based upon Figure 1 of RFCA Attachment 5 (DOE et al. 2003), IHSS Group 700-1 is not located in an area considered prone to landslides or erosion.

### **Screen 3 – Does subsurface soil radiological contamination exceed criteria in Section 5.3 and Attachment 14?**

Radionuclides were not a COC at IHSS Group 700-1.

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

No. Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by IHSS Group 700-1 contaminants of concern (COCs). However, migration via erosion is unlikely because IHSS Group 700-1 is not located in an area prone to landslides or erosion. Additionally, no COCs were detected at any of the sampling locations for IHSS Group 700-1.

**4.0 NFAA SUMMARY**

Based on analytical results and the SSRS, action is not required, and an NFAA determination is justified for IHSS Group 700-1 based on the following:

- Concentrations of COCs were not detected at any of the sampling locations for IHSS Group 700-1.
- Migration of contaminants to surface water through erosion is unlikely because the area is not prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because no COCs were detected at any of the sampling locations for IHSS Group 700-1. Groundwater will be further evaluated in a future decision document.

Approval of this Data Summary Report constitutes regulatory agency concurrence that IHSS Group 700-1 is an NFAA Site. This information and the NFAA determination will be documented in the FY04 HRR. Ecological factors will be evaluated in the AAESE and the CRA.

**5.0 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-04-15-04 [DOE 2004]), 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 Data Quality Assessment (DQA), as described in the following sections.

**5.1 Data Quality Assessment Process**

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

- U.S. Environmental Protection Agency (EPA) QA/G-4, 1994a, Guidance for the Data Quality Objective Process;

- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process, Practical Methods for Data Analysis; and
- U.S. Department of Energy (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 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review;
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review;
- Kaiser-Hill Company, L.L.C. (K-H) V&V Guidelines:
  - General Guidelines for Data Verification and Validation, DA-GR01-v1, 2002a
  - V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, 2002b
  - V&V Guidelines for Volatile Organics, DA-SS01-v1, 2002c
  - V&V Guidelines for Semivolatile Organics, DA-SS02-v1, 2002d
  - V&V Guidelines for Metals, DA-SS05-v1, 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 the Colorado Department of Public Health and Environment (CDPHE) and/or EPA.

## **5.2 Verification and Validation of Results**

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

- Chain-of-custody;

- Preservation and hold times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/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 (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 SWD.

Both real and QC data are included on the enclosed CD.

### **5.2.1 Accuracy**

The following measures of accuracy were evaluated:

- 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 WRW ALs when QC results could indicate unacceptable levels of uncertainty for decision-making purposes.

**Laboratory Control Sample Evaluation**

The frequency of LCS measurements is presented in Table 3. As indicated in Table 3 CSs were run for method SW-846 8260.

The minimum and maximum LCS results are tabulated by chemical for the entire project in Table 4. 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. Analytes with unacceptable low recoveries are evaluated. If the highest sample result 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 affect project decisions. All LCS results are within tolerances, and therefore project decisions were not affected. Any qualifications of individual results due to LCS performance exceeding upper or lower tolerance limits are captured in the V&V flags, described in the Completeness Section 5.2.3.

**Table 3  
LCS Frequency**

Test Method	Lab Batch	Laboratory Control Standards
SW-846 8260	4210697	Yes
SW-846 8260	MS1 VOA_040721A	Yes
SW-846 8260	MS2 VOA_040722A	Yes
SW-846 8260	MS3 VOA_040722A	Yes

**Table 4  
LCS Evaluation Summary**

Test Method	CAS No.	Analyte	Minimum (%REC)	Maximum (%REC)
SW-846 8260	71-55-6	1,1,1-Trichloroethane	95.71	114.4
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	96	107
SW-846 8260	79-00-5	1,1,2-Trichloroethane	98	103.6
SW-846 8260	75-34-3	1,1-Dichloroethane	96	113.7
SW-846 8260	75-35-4	1,1-Dichloroethene	95	131.2
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	98	124.1
SW-846 8260	95-50-1	1,2-Dichlorobenzene	96	115.6
SW-846 8260	107-06-2	1,2-Dichloroethane	95.29	103
SW-846 8260	78-87-5	1,2-Dichloropropane	96.21	110.8
SW-846 8260	106-46-7	1,4-Dichlorobenzene	96	119.8
SW-846 8260	78-93-3	2-Butanone	86.99	113.3
SW-846 8260	108-10-1	4-Methyl-2-pentanone	95	117.4
SW-846 8260	67-64-1	Acetone	79.55	105.9
SW-846 8260	71-43-2	Benzene	99.46	119.7

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Test Method	CAS No.	Analyte	Minimum (%REC)	Maximum (%REC)
SW-846 8260	75-27-4	Bromodichloromethane	98.23	103.8
SW-846 8260	75-25-2	Bromoform	90.16	104
SW-846 8260	74-83-9	Bromomethane	81.38	103.6
SW-846 8260	75-15-0	Carbon Disulfide	89	153.1
SW-846 8260	56-23-5	Carbon Tetrachloride	95.46	118.1
SW-846 8260	108-90-7	Chlorobenzene	97	118.3
SW-846 8260	75-00-3	Chloroethane	94	119.4
SW-846 8260	67-66-3	Chloroform	99.21	108.7
SW-846 8260	74-87-3	Chloromethane	87	116.2
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	97.89	106
SW-846 8260	124-48-1	Dibromochloromethane	100.5	104.3
SW-846 8260	100-41-4	Ethylbenzene	99	122.5
SW-846 8260	87-68-3	Hexachlorobutadiene	98	121.2
SW-846 8260	75-09-2	Methylene chloride	101	114
SW-846 8260	91-20-3	Naphthalene	94	117.7
SW-846 8260	100-42-5	Styrene	102	119
SW-846 8260	127-18-4	Tetrachloroethene	97	127.4
SW-846 8260	108-88-3	Toluene	95	125
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	105	113.3
SW-846 8260	79-01-6	Trichloroethene	97.64	121.3
SW-846 8260	75-01-4	Vinyl chloride	99	124.6
SW-846 8260	1330-20-7	Xylene	99	119.5

**Surrogate Evaluation**

The minimum and maximum surrogate results are tabulated by chemical for the entire project in Table 5. Surrogates are added to every sample, and therefore surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential matrix effects. Surrogate recoveries reported above 100 percent may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed. Therefore, only the lowest recoveries are evaluated. If the maximum sample result divided by the lowest percent 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. The surrogate recoveries and the associated samples results for this project were reviewed. The review indicated project decisions would not be impacted. Any qualifications of results due to surrogate results are captured in the V&V flags, described in Section 5.2.3.

**Table 5**  
**Surrogate Recovery Summary**

Number of Samples	Surrogate	Minimum (%REC)	Maximum (%REC)
<b>VOC Surrogate Recoveries</b>			
12	4-Bromofluorobenzene	93.61	114
12	Deuterated 1,2-dichloroethane	92.29	111.4
12	Deuterated Toluene	88.61	112

**Field Blank Evaluation**

Detectable amounts of contaminants within the blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminant is detected in the associated real samples. When the real result is less than 10 times the blank result for laboratory contaminants and 5 times the result for non-laboratory contaminants, the real result is eliminated. All blank results were less than the detection limits, therefore, are not included in this report.

**Sample Matrix Spike Evaluation**

The minimum and maximum MS results are summarized by chemical for the entire project in Table 6. Organic analytes with unacceptable low recoveries resulted in a review of the LCS recoveries. According to the EPA data validation guidelines, if organic MS recoveries are low, then the LCS recovery is to be checked and, if acceptable, no action is to be taken. While the recovery for hexachlorobutadiene was low, these checks indicate no decisions were impacted for organic analytes, therefore no action was taken.

For inorganics, the associated sample results were divided by the lowest percent recovery for each analyte. If the resulting number is less than the WRW AL, decisions were not impacted, therefore no action was taken. For this project, no metals analyses were conducted.

**Table 6**  
**Sample MS Evaluation Summary**

Test Method	CAS No.	Analyte	Minimum (%REC)	Maximum (%REC)	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8260	71-55-6	1,1,1-Trichloroethane	95.95	102.2	2	2
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	74.04	88.51	2	2
SW-846 8260	79-00-5	1,1,2-Trichloroethane	98	101.2	2	2
SW-846 8260	75-34-3	1,1-Dichloroethane	94.52	100.6	2	2
SW-846 8260	75-35-4	1,1-Dichloroethene	86.29	91.58	2	2
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	55.5	87.29	2	2
SW-846 8260	95-50-1	1,2-Dichlorobenzene	79.77	91.31	2	2
SW-846 8260	107-06-2	1,2-Dichloroethane	99.26	105.5	2	2

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Test Method	CAS No.	Analyte	Minimum (%REC)	Maximum (%REC)	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8260	78-87-5	1,2-Dichloropropane	93.52	101.1	2	2
SW-846 8260	106-46-7	1,4-Dichlorobenzene	79.08	90.02	2	2
SW-846 8260	78-93-3	2-Butanone	112.6	123.5	2	2
SW-846 8260	108-10-1	4-Methyl-2-pentanone	97.17	102.6	2	2
SW-846 8260	67-64-1	Acetone	119.2	138.6	2	2
SW-846 8260	71-43-2	Benzene	92.1	96.33	2	2
SW-846 8260	75-27-4	Bromodichloromethane	100	102.5	2	2
SW-846 8260	75-25-2	Bromoform	100.6	112.5	2	2
SW-846 8260	74-83-9	Bromomethane	101.8	114.7	2	2
SW-846 8260	75-15-0	Carbon Disulfide	69.62	76.33	2	2
SW-846 8260	56-23-5	Carbon Tetrachloride	94.93	97.04	2	2
SW-846 8260	108-90-7	Chlorobenzene	92.3	94.07	2	2
SW-846 8260	75-00-3	Chloroethane	84.68	98.27	2	2
SW-846 8260	67-66-3	Chloroform	98	101.3	2	2
SW-846 8260	74-87-3	Chloromethane	78.96	100.6	2	2
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	95.53	100.4	2	2
SW-846 8260	124-48-1	Dibromochloromethane	99.15	99.89	2	2
SW-846 8260	100-41-4	Ethylbenzene	89.46	90.56	2	2
SW-846 8260	87-68-3	Hexachlorobutadiene	43.85	85.57	2	2
SW-846 8260	75-09-2	Methylene chloride	92.62	97.92	2	2
SW-846 8260	91-20-3	Naphthalene	75.43	97.61	2	2
SW-846 8260	100-42-5	Styrene	90.04	92.99	2	2
SW-846 8260	127-18-4	Tetrachloroethene	86.32	93.45	2	2
SW-846 8260	108-88-3	Toluene	90.71	91.92	2	2
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	87.62	95.47	2	2
SW-846 8260	79-01-6	Trichloroethene	98.21	111.1	2	2
SW-846 8260	75-01-4	Vinyl chloride	74.77	93.59	2	2
SW-846 8260	1330-20-7	Xylene	90.67	91.89	2	2

## 5.2.2 Precision

### *Matrix Spike Duplicate Evaluation*

Laboratory precision is measured through use of MSDs which are summarized in Table 7. The analytes with the highest relative percent differences (RPDs) were reviewed by comparing the highest sample result to the WRW AL. If the highest samples were sufficiently below the WRW AL, no further action is needed. For this project, the reviews indicated decisions were not impacted.

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**Table 7**  
**Sample MSD Evaluation Summary**

Test Method	CAS No.	Analyte	Maximum RPD (%)
SW-846 8260	71-55-6	1,1,1-Trichloroethane	2.37
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	8.15
SW-846 8260	79-00-5	1,1,2-Trichloroethane	8.39
SW-846 8260	75-34-3	1,1-Dichloroethane	5.89
SW-846 8260	75-35-4	1,1-Dichloroethene	2.24
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	12.45
SW-846 8260	95-50-1	1,2-Dichlorobenzene	8.22
SW-846 8260	107-06-2	1,2-Dichloroethane	7.83
SW-846 8260	78-87-5	1,2-Dichloropropane	7.03
SW-846 8260	106-46-7	1,4-Dichlorobenzene	8.49
SW-846 8260	78-93-3	2-Butanone	11.29
SW-846 8260	108-10-1	4-Methyl-2-pentanone	4.97
SW-846 8260	67-64-1	Acetone	10.40
SW-846 8260	71-43-2	Benzene	6.10
SW-846 8260	75-27-4	Bromodichloromethane	8.08
SW-846 8260	75-25-2	Bromoform	7.85
SW-846 8260	74-83-9	Bromomethane	9.65
SW-846 8260	75-15-0	Carbon Disulfide	2.40
SW-846 8260	56-23-5	Carbon Tetrachloride	3.00
SW-846 8260	108-90-7	Chlorobenzene	8.48
SW-846 8260	75-00-3	Chloroethane	7.05
SW-846 8260	67-66-3	Chloroform	7.09
SW-846 8260	74-87-3	Chloromethane	2.93
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	8.21
SW-846 8260	124-48-1	Dibromochloromethane	9.84
SW-846 8260	100-41-4	Ethylbenzene	6.62
SW-846 8260	87-68-3	Hexachlorobutadiene	13.56
SW-846 8260	75-09-2	Methylene chloride	6.88
SW-846 8260	91-20-3	Naphthalene	6.75
SW-846 8260	100-42-5	Styrene	9.06
SW-846 8260	127-18-4	Tetrachloroethene	5.55
SW-846 8260	108-88-3	Toluene	7.50
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	9.54
SW-846 8260	79-01-6	Trichloroethene	4.36
SW-846 8260	75-01-4	Vinyl chloride	1.21
SW-846 8260	1330-20-7	Xylene	7.13

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**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 8 indicates that sampling frequencies were adequate for all samples collected.

**Table 8  
Field Duplicate Sample Frequency Summary**

Test Method	Sample Code	Number of Samples	% Duplicate Samples
SW-846 8260	REAL	12	16.67
	DUP	2	

The RPDs indicate how much variation exists in the field duplicate analyses. The EPA data validation guidelines state that “there are no required review criteria for field duplicate analyses comparability.” For the DQA, the highest Max RPDs shown in Table 9 were reviewed. For IHSS Group 700-1, all RPD results were found to be adequate.

**Table 9  
RPD Evaluation Summary**

Laboratory	Analyte	Maximum of RPD (%)
ESTLDEN	1,1,1-Trichloroethane	0.00
ESTLDEN	1,1-Dichloroethane	0.00
ESTLDEN	1,2,4-Trichlorobenzene	1.87
ESTLDEN	1,2-Dichloroethane	0.00
ESTLDEN	4-Methyl-2-pentanone	4.65
ESTLDEN	Benzene	1.87
ESTLDEN	Bromodichloromethane	1.87
ESTLDEN	Bromoform	1.87
ESTLDEN	Carbon Disulfide	1.87
ESTLDEN	Chlorobenzene	1.87
ESTLDEN	Chloroform	1.87
ESTLDEN	cis-1,3-Dichloropropene	1.87
ESTLDEN	Dibromochloromethane	1.87
ESTLDEN	Methylene chloride	1.87
ESTLDEN	Naphthalene	1.87
ESTLDEN	Styrene	1.87
ESTLDEN	Tetrachloroethene	0.00
ESTLDEN	Toluene	1.87
ESTLDEN	trans-1,3-Dichloropropene	0.00
ESTLDEN	Trichloroethene	1.87

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### 5.2.3 Completeness

Based on original project DQOs, a minimum of 25 percent of Environmental Restoration (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 10 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. The summary of verified and validated records indicates that the data is acceptable.

**Table 10**  
**Validation and Verification Summary**

Validation Qualifier Code	Total of CAS Number	SW-846 8260
UJ	10	10
V	566	566
Total	576	576
Validated	576	576
% Validated	100.00%	100.00%

Validated - J, V, JB, UJ  
Verified - 1, J1, V1, B1, UJ1

### 5.2.4 Sensitivity

RLs, in units of micrograms per kilogram (ug/kg) for organics were compared with RFCA WRW 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.

### 5.3 Summary of Data Quality

RPDs greater than 35 percent indicate the sampling precision limits of some analytes have been exceeded. No records were rejected. Only 15 percent of the SW-846 6010 records were validated. If additional V&V information is received, IHSS Group 700-1 records will be updated in SWD. Data qualified as a result of additional data will be assessed as part of the CRA process. Data collected and used for IHSS Group 700-1 are adequate for decision making based on ER Program Goals.

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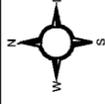
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**Figure 1**  
**IHSS Group 700-1**  
**Location Map**

**KEY**

-  PAC
-  Dirt Road
-  Paved Road
-  Stream
-  Lake
-  Fence
-  Structure
-  Demolished
-  Standing

Project: Rocky Flats Environmental Technology Site  
 Drawing: 700-1-100000-1.dwg  
 Date: 8/20/04  
 Author: [illegible]



Scale = 1:7,000

State Plane Coordinate Projection  
 Colorado Central Zone  
 Datum: NAD 27

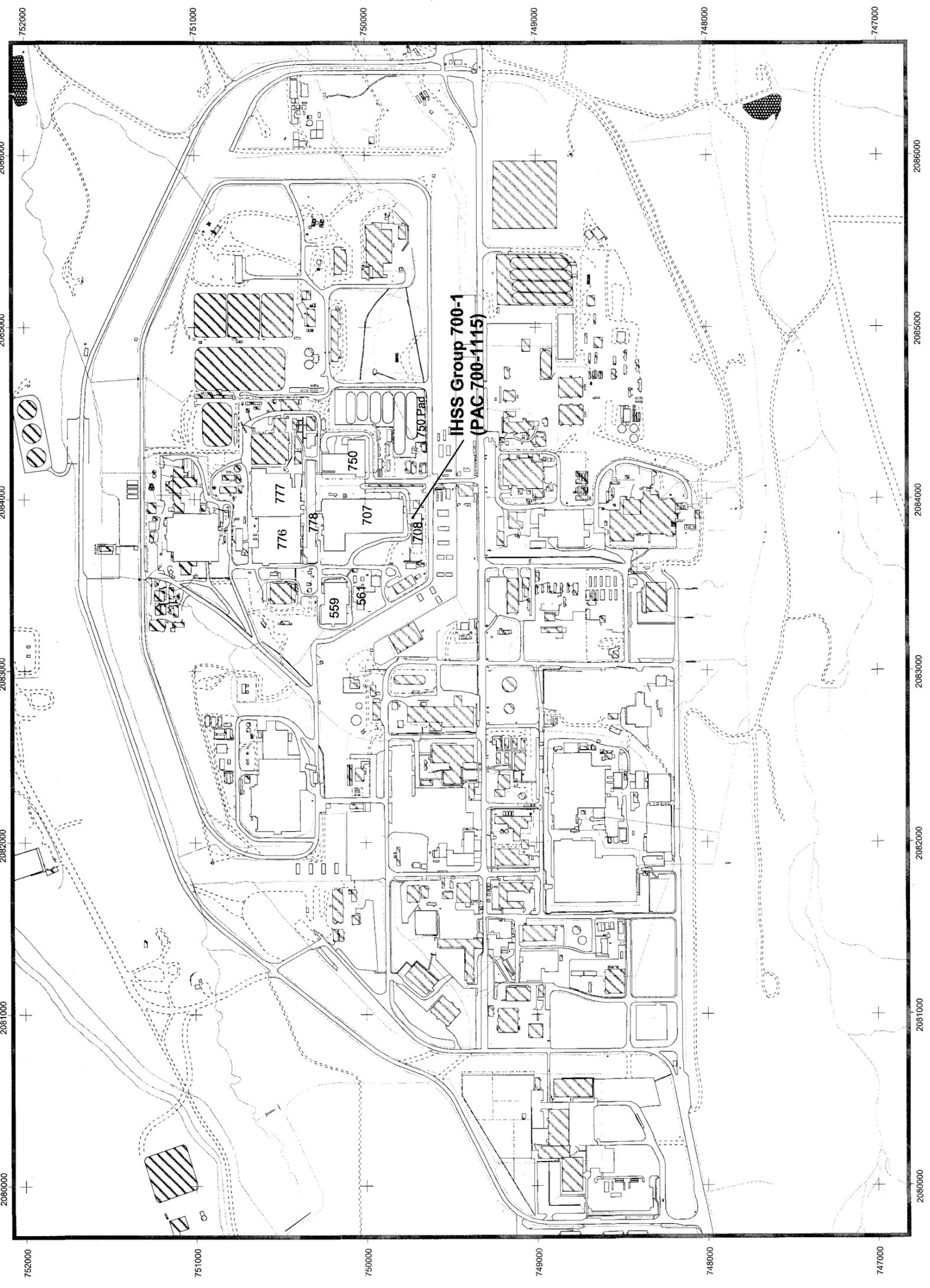
U.S. Department of Energy  
 Rocky Flats Environmental Technology Site

Prepared by: **RADMS**  
 Date: August 2004

Prepared for:



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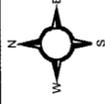


**Figure 2**  
**IHSS Group 700-1**  
**Sampling Locations**

**KEY**

- Sampling Location**
- Actual
  - Proposed
- Infrastructure**
- ▭ Dirt Road
  - ▭ Stream
  - ▭ Storm sewer
  - ▭ PAC
  - ▭ UBC
- Structure**
- ▭ Demolished
  - ▭ Standing
- Paved Road**
- ▭ Asphalt

Prepared by: RADMS  
 Date: August 2004



Scale = 1:500  
 State Plane Coordinate Projection  
 Colorado Central Zone  
 Datum: NAD 27

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

Prepared by: RADMS  
 Date: August 2004



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