

# **NOTICE**

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

AR

REF: 03-RF-01499 ; JLB-099-C3

**DRAFT ENVIRONMENTAL RESTORATION  
RFCA STANDARD OPERATING PROTOCOL  
FOR ROUTINE SOIL REMEDIATION  
FY03 NOTIFICATION #03-14  
IHSS GROUP 000-2**



**October 2003**

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**DRAFT ENVIRONMENTAL RESTORATION  
RFCA STANDARD OPERATING PROTOCOL  
FOR ROUTINE SOIL REMEDIATION  
FY03 NOTIFICATION #03-14  
IHSS GROUP 000-2**

Approval received from the Colorado Department of Public Health and Environment

( )

Approval letter contained in the Administrative Record

October 2003

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## ACRONYMS

AL	action level
cy	cubic yard
D&D	Decontamination and Decommissioning
DOE	Department of Energy
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol
FY	Fiscal Year
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
nCi/g	nanocuries per gram
OPWL	Original Process Waste Lines
PAC	Potential Area of Concern
PCOC	potential contaminant of concern
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RSOP	RFCA Standard Operating Protocol
SSRS	Subsurface Soil Risk Screen
SVOC	semi-volatile organic compound
UBC	Under Building Contamination
VOC	volatile organic compound
WRW	Wildlife Refuge Worker

## 1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2002) Fiscal Year (FY) 03 Notification includes the notification to remediate Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), and Under Building Contamination (UBC) Sites at the Rocky Flats Environmental Technology Site (RFETS) Industrial Area (IA) during FY04. The purpose of this Notification is to invoke the ER RSOP for IHSS Group 000-2. Activities specified in the ER RSOP are not reiterated here, however, deviations from the ER RSOP are included where appropriate.

Original Process Waste Lines (OPWL), related valve vaults, and associated soil will be remediated in accordance with RFCA Attachment 14 (DOE et al 2003). The OPWL system is shown on Figure 1, and the proposed remediation area covered under ER RSOP Notification #03-14 is listed in Table 1.

**Table 1**  
**Potential Remediation Area for IHSS Group 000-2**

IHSS Group	IHSS/PAC/UBC Site	PCOCs	Media	Estimated Remediation Volume
000-2	IHSS 000-121, Original Process Waste Lines	Radionuclides, Metals, VOCs, SVOCs, Nitrite	Piping, concrete and subsurface soil	50 cy
	IHSS 700-123.2, Valve Vault West of Building 707	Radionuclides, Metals, VOCs	Subsurface soil	5 cy
	IHSS 100-602, Building 123 Process Line Break	Radionuclides	Subsurface soil	5 cy
	IHSS 000-121, Tank 29 – OPWL	Radionuclides, Metals, VOCs	Surface and subsurface soil	5 cy
	IHSS 000-121, Tank 31 – OPWL	Radionuclides, Metals, VOCs	Surface and subsurface soil	5 cy
	IHSS Group 700-127, Low-Level Radioactive Waste Leak	Radionuclides	Surface and subsurface soil	5 cy
	IHSS Group 700-147.1, Process Waste Line Leaks	Radionuclides, Metals, VOCs	Surface and subsurface soil	5 cy
	IHSS Group 000-162, Radioactive Site 700 Area	Radionuclides, PCBs	Surface soil	5 cy

VOCs – volatile organic compounds  
 SVOCs – semi- volatile organic compounds  
 cy – cubic yards

## 2.0 IHSS GROUP 000-2

IHSS Group 000-2 includes IHSS 000-121, Original Process Waste Lines. The IHSS site is shown on Figure 1. Not included is the portion of IHSS 000-121 associated with other IHSS Groups.

## **2.1 Potential Contaminants of Concern**

Potential contaminants of concern (PCOCs) at IHSS Group 000-2 are listed in Table 1. However, PCOCs vary with location. The PCOCs at IHSS Group 000-2 were determined based on process knowledge and data collected during previous studies (DOE 1992, DOE 1996, DOE 1998, DOE 2000, and DOE 2001).

## **2.2 Project Conditions**

The following conditions are present within the IHSS Group 000-2 area:

- The OPWL system consisted of approximately 35,000 feet of pipeline and 39 separate tank locations that house a total of 73 tanks (DOE 1992). OPWL tanks and pipelines existed in RFETS Areas 100, 400, 500, 600, 700, 800, and 900; the Solar Evaporation Ponds; and the northeast Buffer Zone between 900 Area and holding Pond B-2 (refer to Figure 1).
- Some of the tanks and pipelines from the OPWL system were removed, other lines were incorporated into the New Process Waste Lines system, and some tanks were converted into the plenum deluge system. The OPWL that was not replaced or removed remains in place and consists of 66 pipeline segments and 5 pipeline spurs (refer to Figure 2). Most of the OPWL is located in highly congested areas with other active and inactive utility lines. Approximately 13,000 feet of pipeline is beneath buildings, with another 7,000 feet beneath asphalt or concrete (DOE 1992).
- The pipelines range from 1 to 10 inches in diameter and are constructed of a variety of materials, including black iron, cast iron, plastic, polyethylene, vitrified clay, cement/asbestos, saran-lined steel, stainless steel, fiberglass, PVC, Pyrex, and Teflon.
- Valve vaults (manholes) provided access for operation and maintenance. These were included in the initial installation or added later at locations with persistent leaks, such as at elbows, valves, and transitions from one pipe material to another (DOE 1992). RFCA Attachment 14 (DOE et al 2003) indicates that there are approximately 30 valve vaults (manholes) in the system.
- Numerous accidental releases of process waste occurred during the operating history of the OPWL and may have resulted in environmental contamination. Releases occurred throughout the system at tank/pipeline connections, pipeline joints, elbows and reducers, junction boxes, and valves. Releases also occurred as a result of pipeline breakage due to construction activities, soil settling, and building foundation settling; overflow of tanks, pipeline junction boxes, and valve vaults; and tank and pipeline corrosion and deterioration. Known and suspected release sites are shown on Figure 3.
- The wastes transported were various aqueous process wastes containing low-level radioactive materials, nitrates, caustics, and acids. Small quantities of other liquids were also handled, including medical decontamination fluids, miscellaneous

laboratory wastes, and laundry effluent. These process waste streams also contained metals, VOCs, oil and grease, and cleaning compounds (DOE 1992). The potential contamination from these released constituents has not yet been fully characterized. Some OPWL characterization has been conducted during the characterization of other IHSS Groups, including 100-4 (UBC 123; DOE 2003a), 700-4 (UBC 771 and UBC 774; results not yet published), 800-4 (UBC 886; DOE 2003b), 800-6 (UBC 889; DOE 2003c), and 800-2 (UBC 881; DOE 2003d). Figure 4 shows analytical results greater than the RFCA soil ALs. IHSS Group 000-2 will be characterized in accordance with RFCA Attachment 14 (DOE et al 2003); IA Sampling and Analysis Plan (IASAP) Addenda #IA-03-11 (IHSS Group 000-2; DOE 2003e), #IA-03-12 (IHSS Group 500-3; DOE 2003f), and #IA-03-15 (IHSS Group 700-7; DOE 2003g); and IASAP Addenda for IHSS Group 700-2 (not yet published) and IHSS Group 800-3 (not yet published).

### **2.3 RFCA Subsurface Soil Risk Screen Evaluation**

Because the OPWL are spread out across the Site, the Subsurface Soil Risk Screen (SSRS) will be conducted (1) when the OPWL are characterized as part of another IHSS Group (DOE 2003e, 2003f, and 2003g); or (2) when IHSS Group 000-2 characterization data become available. SSRSs will evaluate the potential risk of exposure and the need for further accelerated action. SSRS results will be documented in individual closeout and data summary reports.

### **2.4 Remediation Plan**

This RSOP Notification remediation plan for IHSS Group 000-2 includes the following objectives:

- Remove all OPWL within 3 feet of the existing grade in accordance with RFCA Attachment 14 (DOE et al 2003). Record the actual depth, elevation, composition, condition and dimensions of OPWL components encountered. Record the length of pipe removed.
- Remove OPWL valve vaults (manholes) down to a minimum of 6 feet below the surface. Remove OPWL valve vaults deeper than 6 feet below the surface to the extent practicable in accordance with RFCA Attachment 14 (DOE et al 2003), giving due consideration to the safety of workers.
- Once an OPWL or associated valve vault (manhole) is opened, and where safe and practical, the pipe will be grouted or foamed to minimize the possibility of mobilizing contamination inside the OPWL. Conduct radiation surveys at all pipe ends. Record the coordinates of pipe ends and the grouting material used.
- Sample and analyze liquids that are found in OPWL components and require disposition. To minimize the risk of mobilizing and transporting contaminants into subsurface soil, flushing of the OPWL is not anticipated or required.

THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:  
(Ref: 03-RF-01499; JLB-099-03)

**Draft Environmental Restoration  
RFCA Standard Operating Protocol  
for Routine Soil Remediation FY03  
Notification 03-14 IHSS Group 000-2**

**October 2003**

**Figure 2:**

**OPWL Sampling Results Greater than  
RFCA Action Levels**

**File: W:\000-2characterization4-2-03sps/apr**

**August 31, 2003**

**CERCLA Administrative Record Document, IA-A-001682**

U.S. DEPARTMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

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- Remove soil contaminated at concentrations above the ALs for plutonium and americium by any leaks from OPWL within 3 feet of the ground surface to a depth of 3 feet in accordance with RFCA Attachment 14 (DOE et al 2003).
- If the plutonium concentration is greater than 3 nanocuries per gram (nCi/g) between 3 and 6 feet below the surface and the areal or volumetric extent of contamination exceeds the trigger values provided in Attachment 14, Table A14-1 (DOE et al 2003), remove radionuclide contamination to less than 1 nCi/g. If plutonium or americium is present below 6 feet, conduct a SSRS.
- If non-radionuclide or uranium contaminant concentrations greater than the RFCA Wildlife Refuge Worker (WRW) ALs extends below 6 inches in depth, perform the SSRS to evaluate the potential risk of exposure and the need for further accelerated action.
- Consult with regulatory agencies if contaminant concentrations are greater than the proposed ecological ALs but lower than the WRW ALs.
- If contaminated soil is removed, collect confirmation soil samples in accordance with the IASAP (DOE 2001).

It is anticipated that after remediation there may be areas with concentrations of radionuclides, metals, and organics greater than the background means plus two standard deviations or the method detection/reporting limits, but below RFCA ALs.

## **2.5 Stewardship Evaluation**

Based on the PCOCs (Table 1 and Section 2.1) and the ER RSOP (DOE 2002), it is anticipated that all contamination above RFCA ALs will be remediated. Figure 3 shows the potential remediation areas.

Because the OPWL are spread out across the Site and the full extent of excavation and remediation is not known at this time, stewardship evaluations will be conducted during remediation of individual IHSS Groups, including IHSS Groups 000-2, 500-3, 700-2, 700-7 and 800-3. Stewardship evaluations will be conducted using the consultative process and will be documented in individual closeout reports. A new map of residual contamination will be generated after remediation of individual IHSS Groups. Removed and remaining OPWL components will also be documented in individual closeout reports.

## **2.6 Accelerated Action Remediation Goals**

ER RSOP remedial action objectives include the following:

1. Provide a remedy consistent with the RFETS goal of protection of human health and the environment;

2. Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and
3. Minimize the spread of contaminants during implementation of accelerated actions.

## **2.7 Treatment**

Not applicable.

## **2.8 Project-Specific Monitoring**

High-volume air samplers may be used at various remediation areas within IHSS Group 000-2 consistent with work controls to determine airborne radioactivity concentrations. Such areas may include locations with known or suspected leaks (Figure 3) and will be identified based on characterization results.

## **2.9 Resource Conservation and Recovery Act (RCRA) Units and Intended Waste Disposition**

Not applicable.

## **2.10 Administrative Record Documents**

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

DOE, 1996, Annual Update, Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1998, Annual Update, Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

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

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

DOE 2003a, Final Closeout Report for IHSS Group 100-4, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE 2003b, Final Closeout Report for IHSS Group 800-4, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE 2003c, Final Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE 2003d, Final Data Summary Report for IHSS Group 800-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003e, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-11, IHSS Group 000-2, Original Process Waste Lines, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003f, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-12, IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003g, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-15, IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, 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.

## **2.11 Projected Schedule**

Remediation of IHSS Group 800-1 is expected to begin in first quarter of FY 04.

## **3.0 PUBLIC PARTICIPATION**

ER RSOP Notification #03-12 activities were discussed at the October 2003 ER/D&D Status meeting. A PDF version of this notification was provided to the local governments. This notification is available at the Rocky Flats Reading Rooms and on the EDDIE website at [www.rfets.gov](http://www.rfets.gov).

## **4.0 REFERENCES**

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

DOE, 1996, Annual Update, Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1998, Annual Update, Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

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

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

DOE 2003a, Final Closeout Report for IHSS Group 100-4, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE 2003b, Final Closeout Report for IHSS Group 800-4, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE 2003c, Final Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE 2003d, Final Data Summary Report for IHSS Group 800-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003e, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-11, IHSS Group 000-2, Original Process Waste Lines, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003f, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-12, IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003g, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-15, IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, 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.

**Figure 1**  
**IHSS Group 000-2**  
**Location**

**KEY**

- IHSS 
- PAC 
- OPWL 
- Paved area 
- Dirt road 
- Stream, ditch, or drainage 
- Building 
- Demolished 
- Standing 



300 0 300 600 900 Feet

Scale = 1: 11500

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

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

Prepared by:

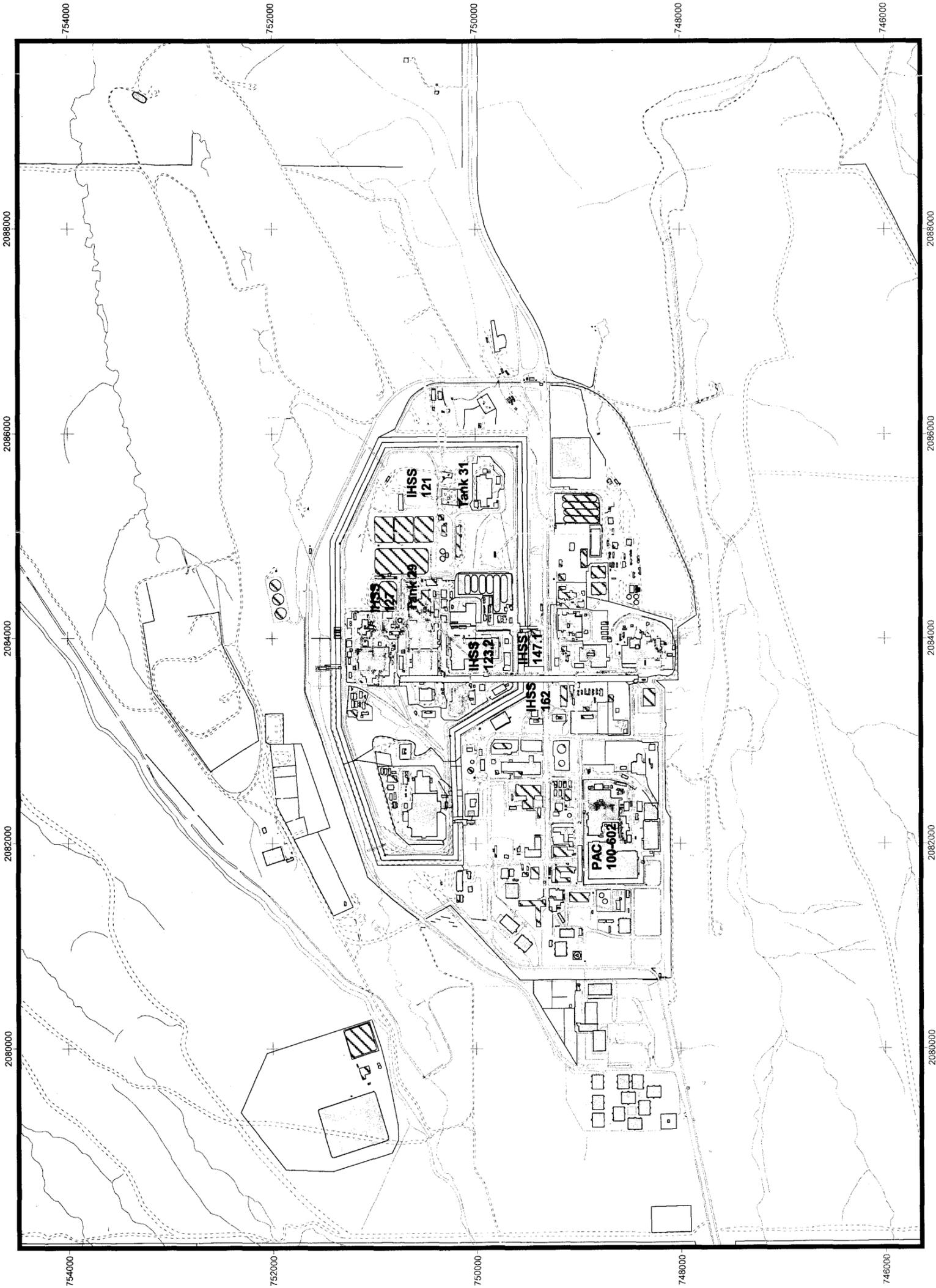


Prepared for:



000-2characterization4-2-03sps.apr/000-2Figure1

September, 2003



**Figure 2**  
**IHSS Group 000-2**  
**OPWL Designations**

**KEY**

- OPWL
- Paved area
- Dirt road
- Stream, ditch, or drainage
- Building
  - Demolished
  - Standing



Scale = 1: 5500

State Plane Coordinate Projection  
 Colorado Central Zone  
 Datum: NAD 27

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

Prepared by:



Prepared for:



File: 000-2characterization4-2-03sps.  
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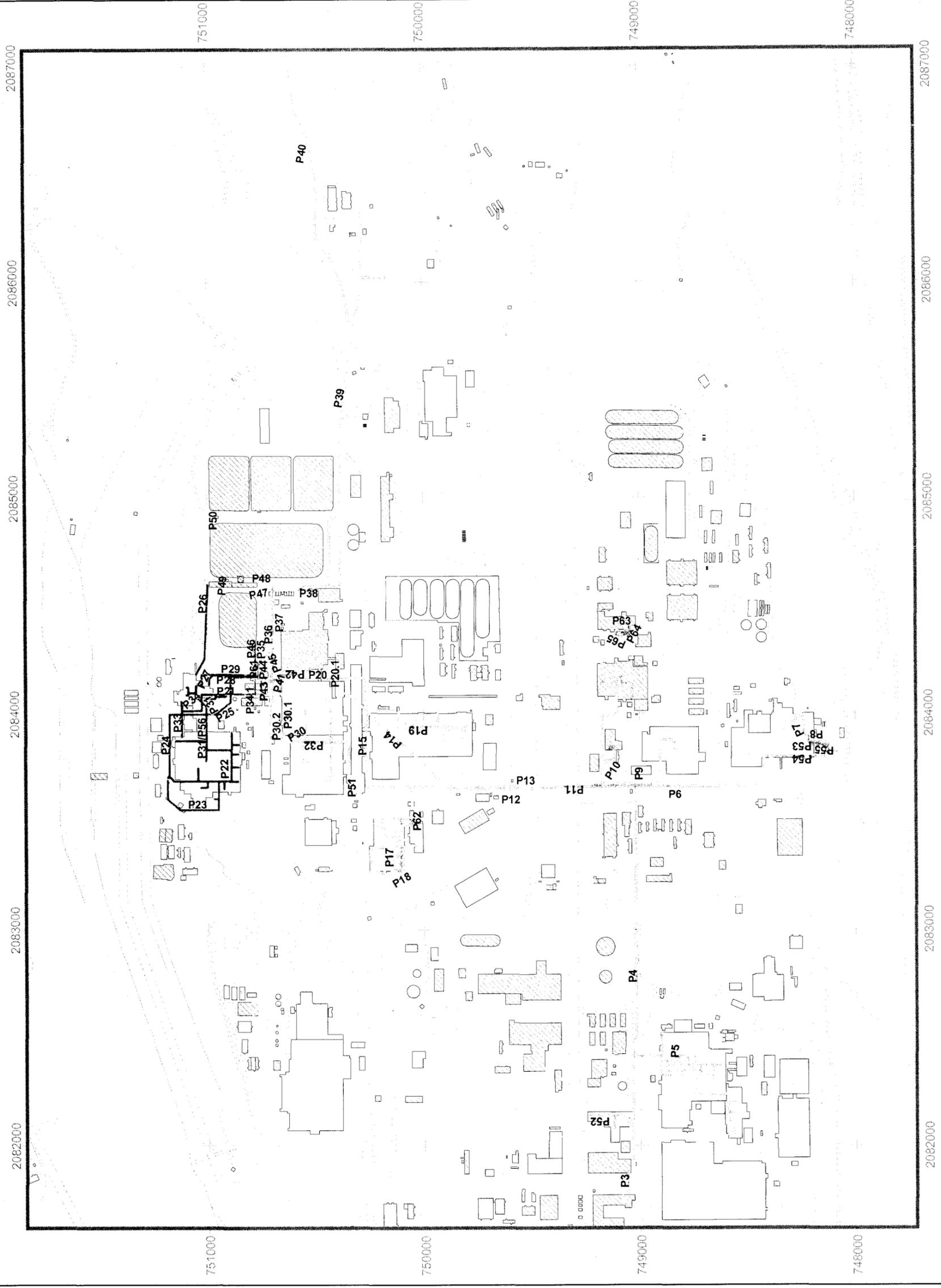
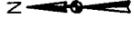


Figure 3  
IHSS Group 000-2  
RFCA Leak Designations

**KEY**

- OPWL
  - Paved area
  - Dirt road
  - Stream, ditch, or drainage
  - Known leaks
  - Suspected leak (line designation)
- Building**
- Demolished
  - Standing
  - Tanks



200 0 200 400 Feet

Scale = 1:6,000

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

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

Prepared by:



Prepared for:

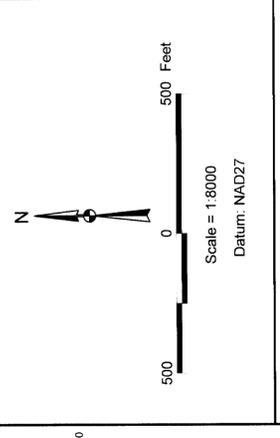


# Figure 4 OPWL Sampling Results Greater Than RFCA Action Levels

- KEY**
- Planned in IHSS 000-2
  - WRW AL Exceedance
  - Eco AL Exceedance
  - Background or DL Exceedance (Does not trigger an accelerated action)
  - Lead Background 24.97 mg/kg
  - Arsenic Background 15.7 mg/kg
  - Beryllium Background 14.2 mg/kg
  - Less than Background or DL
  - Sampled, data not received
  - Sampled
  - Sampled, data omitted
  - ★ Action required

- Other IHSS Group IASAPs**
- Planned in Other IHSS
  - WRW AL Exceedance
  - Eco AL Exceedance
  - Background or DL Exceedance (Does not trigger an accelerated action)
  - Lead Background 24.97 mg/kg
  - Arsenic Background 15.7 mg/kg
  - Beryllium Background 14.2 mg/kg
  - Less than Background or DL
  - Sampled, data not received
  - ★ Action required
- OPWL
- OPWL Removed
  - OPWL Between 3 and 4 Feet/Planned To Be Removed
  - OPWL Does Not Exist
  - Tanks
  - Tanks Does Not Exist
  - Paved area
  - Dirt road
  - Stream, ditch, or drainage

Note: If both the WRW AL and Ecological Receptor AL have been exceeded, the value is shown because it has higher significance regarding remedial decisions.



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