

**Environmental Restoration
RFCA Standard Operating Protocol
for Routine Soil Remediation
FY04 Notification #04-10
IHSS Group 700-11
(Bowman's Pond and Steam Condensate Tanks)**

July 2004

**Environmental Restoration
RFCA Standard Operating Protocol
for Routine Soil Remediation
FY04 Notification #04-10
IHSS Group 700-11
(Bowman's Pond and Steam Condensate Tanks)**

Approval received from the Colorado Department of Public Health and Environment
July 9, 2004.

Approval letter contained in the Administrative Record.

July 2004

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 IHSS GROUP 700-11 1
 2.1 PCOCs.....3
 2.2 Project Conditions.....3
 2.3 RFCA SSRS Evaluation5
 2.4 ER Remediation Plan.....6
 2.5 Stewardship Evaluation6
 2.5.1 Proximity to Other Contaminant Sources7
 2.5.2 Surface Water Protection7
 2.5.3 Monitoring7
 2.5.4 Stewardship Actions and Recommendations.....8
 2.6 Accelerated Action Remediation Goals.....8
 2.7 Treatment9
 2.8 Project-Specific Monitoring.....9
 2.9 Resource Conservation and Recovery Act Units and Intended Waste Disposition.....9
 2.10 Administrative Record Documents.....9
 2.11 Projected Schedule.....10
3.0 PUBLIC PARTICIPATION10
4.0 REFERENCES10

LIST OF FIGURES

Figure 1 IHSS Group 700-11 (IHSS 139.1[N][a] and PAC 700-1108) Location2
Figure 2 IHSS Group 700-11 (IHSS 139.1[N][a] and PAC 700-1108) Potential
Remediation Areas4

LIST OF TABLES

Table 1 Potential Remediation Areas for IHSS Group 700-11.....1

ACRONYMS

| | |
|---------------|--------------------------------------------------------------------------------------------|
| AL | action level |
| AR | Administrative Record |
| BE | Biological Evaluation |
| BMP | best management practice |
| COC | contaminant of concern |
| CY | cubic yard |
| D&D | Decontamination and Decommissioning |
| DOE | U.S. Department of Energy |
| EDDIE | Environmental Data Dynamic Information Exchange |
| EPA | U.S. Environmental Protection Agency |
| ER | Environmental Restoration |
| ER RSOP | Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation |
| FY | Fiscal Year |
| IA | Industrial Area |
| IASAP | Industrial Area Sampling and Analysis Plan |
| IHSS | Individual Hazardous Substance Site |
| K-H | Kaiser-Hill Company, L.L.C. |
| MDL | method detection limit |
| NFAA | No Further Accelerated Action |
| OPWL | Original Process Waste Line |
| PAC | Potential Area of Concern |
| PCB | polychlorinated biphenyl |
| PCOC | potential contaminant of concern |
| PDF | Portable Document Format |
| POC | Point of Compliance |
| POE | Point of Evaluation |
| RAO | remedial action objective |
| RCRA | Resource Conservation and Recovery Act |
| RFCA | Rocky Flats Cleanup Agreement |
| RFETS or Site | Rocky Flats Environmental Technology Site |
| RL | reporting limit |
| RSOP | RFCA Standard Operating Protocol |
| SAP | Sampling and Analysis Plan |
| SEP | Solar Evaporation Ponds |
| SSRS | Subsurface Soil Risk Screen |
| SVOC | semivolatile organic compound |
| UBC | Under Building Contamination |
| USACE | U.S. Army Corps of Engineers |
| 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 2003a) Fiscal Year (FY) 04 Notification includes the notification to remediate Individual Hazardous Substance Sites (IHSSs) and Potential Areas of Concern (PACs) at the Rocky Flats Environmental Technology Site (RFETS or Site) Industrial Area (IA) during FY04. The purpose of this Notification is to invoke the ER RSOP for IHSS Group 700-11. Activities specified in the ER RSOP are not reiterated here; however, deviations from the ER RSOP are included where appropriate.

Sediment and soil with contaminant concentrations greater than the RFCA wildlife refuge worker (WRW) action levels (ALs), or as indicated by the Subsurface Soil Risk Screen (SSRS), will be removed in accordance with RFCA (DOE et al. 2003) and the ER RSOP (DOE 2003a). Remediation of IHSS Group 700-11 is being driven by historical WRW AL exceedances of polychlorinated biphenyls (PCBs) and semivolatile organic compounds (SVOCs). The consultative process will be used throughout this accelerated action.

The location of IHSS Group 700-11 is shown on Figure 1. The proposed remediation sites covered under ER RSOP Notification #04-10 are listed in Table 1.

Table 1
Potential Remediation Areas for IHSS Group 700-11

| IHSS Group | IHSS/PAC Site | PCOCs | Media | Estimated Remediation Volume |
|------------|---------------------------------------------------|--------------------------------------------------|-------------------|------------------------------|
| 700-11 | IHSS 139.1(N)(a) – Steam Condensate Holding Tanks | Metals PCBs Radionuclides VOCs | Soil and sediment | 200 cy |
| | PAC 700-1108 – Bowman’s Pond | Metals PCBs Radionuclides SVOCs VOCs | | |

CY – cubic yards
 PCBs – polychlorinated biphenyls
 SVOCs – semivolatile organic compounds
 VOCs – volatile organic compounds

2.0 IHSS GROUP 700-11

Bowman’s Pond (PAC 700-1108) and the Steam Condensate Tanks (IHSS 139.1[N][a]) comprise IHSS Group 700-11. Both areas are located north of Building 774. Bowman’s Pond is a small, manmade depression that receives flow from foundation drains and storm drains from Buildings 771/774, resulting in a wetland. IHSS 139.1(N)(a) consisted of two steel, aboveground storage tanks that received steam condensate from an evaporative waste concentration system formerly used in Building 774.

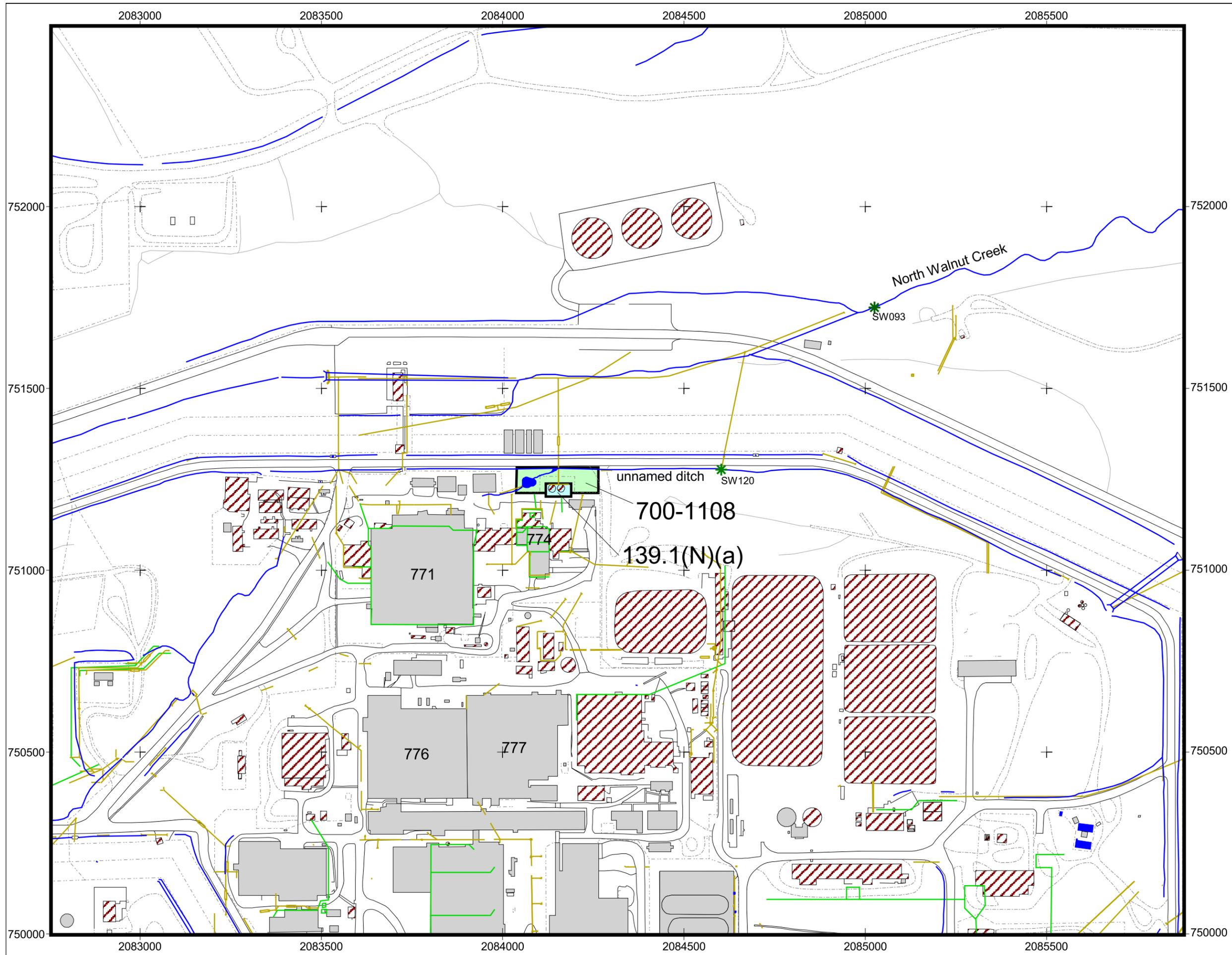
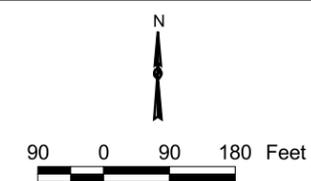


Figure 1

**IHSS Group 700-11
(IHSS 139.1 [N][a]
and
PAC 700-1108)
Location**

KEY

- IHSS 139.1 (N)(a)
(Hydroxide Tank, KOH,
and NaOH condensate)
- PAC 700-1108 (Bowman's Pond)
- Demolished structure
- Structure
- Lakes and ponds
- Paved area
- Dirt road
- Stream, ditch, or other drainage
- Foundation drain
- Storm drain
- Surface water POE



Scale = 1:2,500
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by:

Prepared for:

When operational, condensate was tested for the absence of radioactive contamination and released to either Bowman's Pond or directly to the drainage northeast of Bowman's Pond.

2.1 PCOCs

Potential contaminants of concern (PCOCs) at IHSS Group 700-11 are listed in Table 1. Historical data from the Bowman's Pond area indicate that PCBs and SVOCs are present in sediments at concentrations above the WRW ALs. None of the existing sediment samples from IHSS 139.1(N)(a) contained contaminants at levels above WRW ALs. The PCOCs were determined based on process knowledge, historical knowledge, and data collected during previous studies (DOE 1991, 1992, 1999a, 1999b).

As described in IA Sampling and Analysis Plan (SAP)(IASAP) Addendum #IA-04-10 (DOE 2004), three biased and 12 statistical accelerated action sampling locations were selected to characterize IHSS Group 700-11 and will guide additional action if required. Following removal of the concrete slab in IHSS 139.1(N)(a), confirmation samples will be collected from this area. The potential remediation areas for IHSS Group 700-11, based on historical data and recent accelerated action sampling results are shown on Figure 2.

2.2 Project Conditions

IHSS Group 700-11 is located north of Building 774. Bowman's Pond consists of a small, manmade depression approximately 3 to 4 feet deep with an areal extent of approximately 28 by 33 feet. Bowman's Pond was constructed to retain water discharged from building foundation drains and storm drains from the 700 Area, as shown on Figure 2. The pond discharges to the east, saturating an area approximately 200 by 40 feet resulting in a wetland environment. IHSS 139.1(N)(a) formerly consisted of steam condensate tanks (T-107 and T-108). Although the tanks have been removed, the concrete slab that supported the former tanks remains in place. Generally, surface water drainage in the area generally flows from southwest to northeast.

A storm drain line, originating north of the concrete slab (IHSS 139.1[N][a]), conveys runoff from the slab to the north then east where it empties into North Walnut Creek at surface water monitoring station SW093 (Figure 1). Historical analytical sampling results from sediment collected at SW093 do not indicate the presence of PCBs or other contaminants at levels above WRW ALs. Additionally, pre-accelerated action and recent accelerated action sampling results (CH49-025) from the wetland area near the storm drain in PAC 700-1108 did not contain any contamination at levels exceeding WRW ALs.

The U.S. Department of Energy (DOE) conducted a Biological Evaluation (BE) that describes impacts to wetlands in IHSS Group 700-11. Results of the BE indicate that in November 2001, Terry McKee of the U.S. Army Corps of Engineers (USACE) determined that both Bowman's Pond and the condensate wetland near Bowman's Pond were not jurisdictional wetlands (K-H 2001).

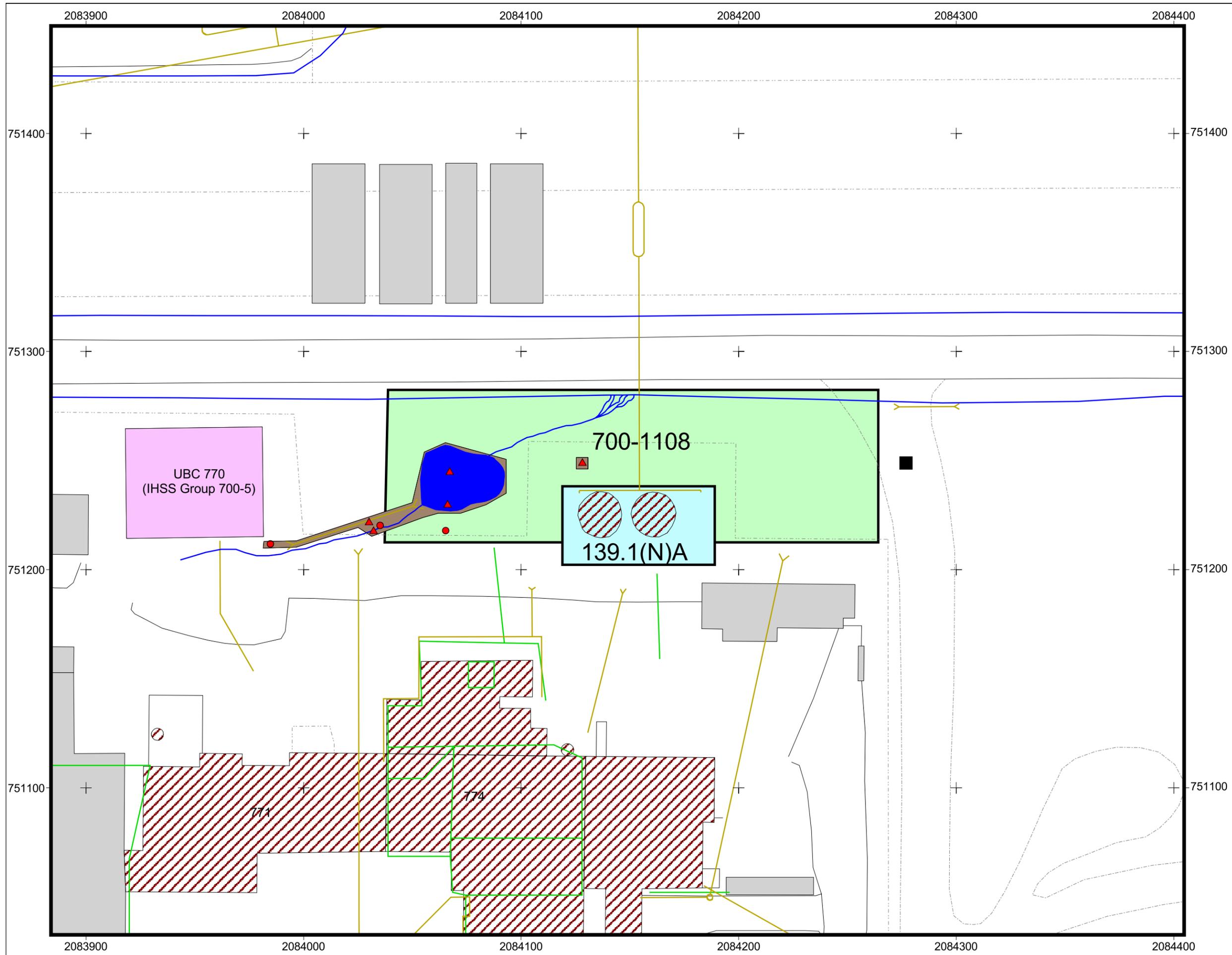


Figure 2
IHSS Group 700-11
(IHSS 139.1 [N][a]
and
PAC 700-1108)
Potential Remediation Areas

- KEY**
- IHSS 139.1(N)(a)
(Hydroxide Tank, KOH, and NaOH condensate)
 - PAC 700-1108 (Bowman's Pond)
 - Potential remediation area
 - IHSS
 - UBC
 - Demolished structure
 - Structure
 - Bowman's Pond
 - Paved area
 - Dirt road
 - Stream, ditch, or other drainage
 - Foundation drain
 - Storm drain
 - Approximate location of air sampler
 - Accelerated Action soil sample WRW AL exceedance
 - Historical sediment sample WRW AL exceedance

N

90 0 90 180 Feet

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:

Prepared for:

The source of water for Bowman's Pond and the condensate wetland is from footer drains from the 700 Area buildings. As the 700 Area buildings are torn down and remediated, water supplying these two small wetland areas will disappear. As a result, both the 700 Area building removal and sediment and soil removal will destroy these small wetland areas. Final contouring of the 700 Area may also bury this area under several feet of overburden. Because these actions are required as part of the Site closure and cleanup under RFCA, these two small wetland areas will be eliminated. The DOE is notifying the U.S. Environmental Protection Agency (EPA) of the results of the BE.

2.3 RFCA SSRS Evaluation

An SSRS is performed when nonradionuclides and uranium are present in soil below 6 inches from the ground surface, or when americium-241 and plutonium-239/240 are present below 3 feet from the ground surface. Current site conditions were evaluated using available data to determine whether remediation is required by the SSRS. An SSRS will be conducted again after the accelerated action and related confirmation sampling tasks are completed. The accelerated actions taken, confirmation results, and a revised SSRS will be documented in the IHSS Group 700-11 Closeout Report.

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

No. Existing soil data, presented in IASAP Addendum #IA-04-10 for IHSS Group 700-11 (DOE 2004), indicate that contaminant concentrations exceed RFCA WRW ALs for PCBs and SVOCs. Additional characterization will be conducted during the implementation of IASAP Addendum #IA-04-10 (DOE 2004).

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

Yes. IHSS Group 700-11 is located near an area subject to erosion or landslides in accordance with Figure 1 of RFCA (DOE et al. 2003). Under the current site conditions, erosion from storm events or flooding is a possible mechanism where subsurface soil could become surface soil or impact surface water in Bowman's Pond.

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

No. Existing soil data, discussed in IASAP Addendum #IA-04-10 for IHSS Group 700-11 (DOE 2004), do not indicate that subsurface concentrations of radionuclides exceed RFCA WRW ALs (RFCA Section 5.3) (DOE et al. 2003). However, further characterization will be performed in accordance with IASAP Addendum #IA-04-10 (DOE 2004), and results will be documented in the Closeout Report. Additionally, Original Process Waste Lines (OPWLs) (Attachment 14) do not exist in IHSS Group 700-11.

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

After Bowman's Pond accelerated action is complete (drained, excavated, and re-vegetated) the potential for exceedances of surface water standards via erosion should be

low. However, erosion of sediment and soil from a significant storm event or flooding in the future will continue to be a pathway for which contaminant migration may occur into and from IHSS Group 700-11.

Runoff from IHSS Group 700-11 drains into an unnamed ditch that flows along the southern side of the perimeter road (north of the former Solar Evaporation Ponds [SEP]) through surface water Point of Evaluation (POE) SW120. Flow at SW120 is directed north into a culvert that empties into North Walnut Creek. Flow downstream of this confluence is monitored by RFCA POE SW093 (DOE 2003b). This POE has had reported exceedances of water quality standards; however, SW093 receives water from a large part of the IA, and surface water quality at this location may not be attributable to any single upgradient IHSS Group. The potential for IHSS Group 700-11 to cause exceedances of surface water standards will be reevaluated based on the final characterization data.

2.4 ER Remediation Plan

The RSOP Notification remediation plan for IHSS Group 700-11 includes the following objectives:

- Remove sediment and soil with nonradionuclide or uranium contaminant concentrations greater than the RFCA WRW ALs to a depth of 6 inches. If sediment and soil with contaminant concentrations greater than WRW ALs extends below 6 inches in depth, perform the SSRS to evaluate the need for further accelerated action.
- Remove and recycle the concrete slab and retaining wall associated with the former steam condensate tanks in IHSS 139.1(N)(a). This concrete is expected to be recycled in accordance with the RSOP for Recycling Concrete (DOE 2003c). Disposal of this concrete is also permitted.
- The storm drain from IHSS 139.1(N)(a) will be plugged.
- Following the removal of contaminated sediment and soil, collect confirmation soil samples in accordance with the IASAP (DOE 2001).

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

2.5 Stewardship Evaluation

Based on the PCOCs (Table 1) and the ER RSOP (DOE 2003a), it is anticipated that all contamination above RFCA ALs will be remediated. Figure 2 shows the potential remediation areas.

An additional stewardship evaluation will be conducted during remediation using the consultative process and documented in a Closeout Report for IHSS Group 700-11. A new map of residual contamination will be generated after remediation. The following sections present the stewardship evaluation.

2.5.1 Proximity to Other Contaminant Sources

IHSS Group 700-11 is in the RFETS IA and is located in close proximity to a potential contaminant source at IHSS Group 700-5. This IHSS Group consists of Under Building Contamination (UBC) 770 and is located west of IHSS Group 700-11 (Figure 2).

Two IHSS Groups located near IHSS Group 700-11 have been designated as No Further Accelerated Action (NFAA) sites. These IHSS Groups include IHSS Groups 000-1 and 700-4. IHSS Group 000-1 includes the SEP and is located east of IHSS Group 700-11. IHSS Group 700-4 includes UBC 771 and UBC 774 and is located south of IHSS Group 700-11.

2.5.2 Surface Water Protection

Surface water protection includes the following considerations:

Is there a pathway to surface water from potential erosion to streams or drainages?

Contaminants in sediment and soil from IHSS Group 700-11 could be eroded causing impacts to surface water.

Do characterization data indicate there are contaminants in surface soil?

Existing sediment data for IHSS Group 700-11 indicate there are concentrations of PCBs and SVOCs that exceed RFCA WRW ALs.

Do monitoring results from POEs or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?

The nearest surface water POE downstream of IHSS Group 700-11 is SW120. Flow at SW120 is directed north into a culvert that empties into North Walnut Creek. Flow downstream of this confluence is monitored by RFCA POE SW093 (DOE 2003b). This POE has had reported exceedances of water quality standards; however, SW093 receives water from a large part of the IA, and surface water quality at this location may not be attributable to any single upgradient IHSS Group. Final characterization data for IHSS Group 700-11 will be evaluated in the Closeout Report.

Is the IHSS Group in an area with high erosion potential?

IHSS Group 700-11 is located near an area subject to erosion in accordance with Figure 1 of the RFCA Modification (DOE et al. 2003). Flow from IHSS Group 700-11 is routed through approximately 700 feet of an unnamed ditch and storm drain, to its eventual confluence with North Walnut Creek.

2.5.3 Monitoring

Monitoring includes the following considerations:

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

The Site plume location map (DOE 2002) indicates that IHSS Group 700-11 is not located in an area of groundwater contamination. There is VOC groundwater contamination south (upgradient) of IHSS Group 700-11 and nitrate groundwater contamination east (cross-gradient) of IHSS Group 700-11. The groundwater plumes are attributable to multiple sources within the IA. Impacted groundwater in this area is downgradient of a significant portion of the IA, and contaminant levels are attributable to many sources upgradient of IHSS Group 700-11. Further groundwater evaluation will be conducted as part of the groundwater plume remedial decision and future Sitewide evaluation.

Can the impact be traced to a specific IHSS Group?

No.

Are additional monitoring stations needed?

Not applicable at this time. The need for and placement of monitoring stations will be re-evaluated in the Long-Term Stewardship Plan.

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable at this time. Existing wells monitor contamination from areas outside IHSS Group 700-11.

2.5.4 Stewardship Actions and Recommendations

The current stewardship actions and recommendations for IHSS Group 700-11 are as follows:

- Use best management practices (BMPs) to reduce erosion into surface water drainage.
- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
 - Restrict access; and
 - Control soil excavations through the Site Soil Disturbance Permit process.
- Implement long-term stewardship actions, including the following:
 - Prohibitions on construction of buildings in the area; and
 - Restrictions on excavations or other soil disturbances.

These recommendations may change based on in-process remediation activities and other future RFETS remediation decisions.

2.6 Accelerated Action Remediation Goals

ER RSOP remedial action objectives (RAOs) include the following:

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

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

2.7 Treatment

Not applicable at this time.

2.8 Project-Specific Monitoring

The need and placement of high-volume air samplers to determine airborne radioactivity activities at the remediation area will be determined as part of the work control package. A potential location of an air sampler is shown on Figure 2.

2.9 Resource Conservation and Recovery Act Units and Intended Waste Disposition

Not applicable.

2.10 Administrative Record Documents

DOE, 1991, Assessment of Known, Suspect, and Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1992-2003, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

DOE, 1999, Closeout Report for the Site Characterization of Bowmans Pond (PAC 700-1108) and Steam Condensate Holding Tanks (IHSS 139.1N), 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, Second Quarter RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Automated Surface-Water Monitoring Report, Water Year 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Revision 1, Golden, Colorado, June.

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.

2.11 Projected Schedule

Remediation of IHSS Group 700-11 is expected to begin in the fourth quarter of FY04.

3.0 PUBLIC PARTICIPATION

ER RSOP Notification #04-10 activities will be discussed at the July 2004 ER/ Decontamination and Decommissioning (D&D) Status meeting. A Portable Document Format (PDF) version of this Notification was provided to the local governments. This Notification is available at the Rocky Flats Reading Rooms and on the Environmental Data Dynamic Information Exchange (EDDIE) Website at www.rfets.gov.

4.0 REFERENCES

- DOE, 1991, Assessment of Known, Suspect, and Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, October.
- DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June.
- DOE, 1999a, Annual Historical Release Report for the Rocky Flats Plant, Golden, Colorado, September.
- DOE, 1999b, Closeout Report for the Site Characterization of Bowmans Pond (PAC 700-1108) and Steam Condensate Holding Tanks (IHSS 139.1N), 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, Second Quarter RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.
- DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.
- DOE, 2003b, Automated Surface-Water Monitoring Report, Water Year 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, November.
- DOE, 2003c, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Revision 1, Golden, Colorado, June.
- DOE, 2004, Industrial Area Sampling and Analysis Plan FY04 Addendum #IA-04-10, IHSS Group 700-11 (Bowman's Pond and Steam Condensate Tanks), Rocky Flats Environmental Technology Site, Golden, Colorado, March.
- 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.

K-H, 2001, Trip Notes from COE Site Visit 11/20/01 (e-mail communication), November.