RCRA Facility Investigation – Remedial Investigation/ Corrective Measures Study – Feasibility Study Report for the Rocky Flats Environmental Technology Site Appendix B - FY2005 FINAL Historical Release Report

Volume II
700 Area – Appendices

June 2006

700 AREA

Figure 21
HRR 700 Area IHSSs and PACs

PAC REFERENCE NUMBER: 700-118.1

IHSS Number:	118.1
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-3
Unit Name:	Solvent Spills West of Building 730

This Final Update to the HRR for PAC 700-118.1 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 118.1 is summarized in this update. The following HRR volumes contain IHSS 118.1 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1998 Annual (DOE 1998).

Date(s) of Operation or Occurrence

Prior to 1970s to June 18, 1981

Historical Summary

IHSS 118.1 consists of the area around a 5,000-gallon underground carbon tetrachloride storage tank located adjacent to the western side of Building 730. The location of IHSS 118.1 is shown on Figure 21. This underground tank had its long axis running north-south, with the southern end exposed in a valve pit. The northern end of the tank was buried directly in soil. The base of the tank was approximately 9.1 ft below grade, and the base of the valve pit was approximately 10.25 ft below grade.

In the 1970s, tank overflows occurred during filling operations. No documentation was found that detailed the response to spills. Persons interviewed recalled a solvent spill of 100 to 200 gallons north of Building 776 prior to 1970 but did not recall any cleanup operations.

Pipes in the tank pit leaked a small amount of carbon tetrachloride in March 1976. Air samples were typically averaging 10 mg/L carbon tetrachloride; however, during the month prior to April 15, 1976, the average concentration increased to almost 2,000 mg/L. It was thought that the tank or its associated pipes in the sump released the carbon tetrachloride into the ground. In winter and spring 1976, there were efforts to stop the pipe leaks.

On June 18, 1981, the tank failed, releasing carbon tetrachloride into the sump and onto the ground surface. The tank was removed following its failure in 1981, along with a limited amount of soil. One Building 776 employee present at the time of the tank's removal recalled that it appeared sound with no obvious leaks or significant corrosion. It was unclear at the time whether the concrete containment structure was removed.

IHSS Investigations

Subsurface soil samples collected as part of the OU 9 Phase I RFI/RI investigation of OPWL Tanks T-9 and T-10 for PAC 700-132 just east of IHSS 118.1 indicated VOCs and particularly carbon tetrachloride were present with maximum concentrations at 20.0 to 22.5 ft (DOE 1995).

At this depth carbon tetrachloride was present at concentrations ranging from 720 to 250,000,000 μg/kg. Other VOCs at this depth with elevated concentrations included acetone, 1,1,2,2-tetrachloroethane, and chloroform.

A pre-RI of IHSS 118.1 was conducted in 1997 to determine the nature and extent of contamination at IHSS 118.1. Results of this investigation confirmed the presence of dense nonaqueous phase liquids (DNAPLs) in this area. Subsurface soil samples collected from 20 to 25 ft in depth indicated carbon tetrachloride was present at concentrations as high as 390,000 μg/kg. Investigation results determined that the carbon tetrachloride was a DNAPL that pooled on the bedrock below Tanks T-9 and T-10.

Based on historical knowledge and data, soil within IHSS 118.1 was not sampled as part of the IHSS Group 700-3 accelerated action characterization. Building 730 (part of IHSS 132), the tanks, and contaminated soil (including PAC 700-144[N]) were to be removed, therefore characterization was not necessary.

IHSS 118.1, along with IHSSs 132 and 144(N), was remediated through a RFCA accelerated action (DOE et al. 1996) in accordance with ER RSOP Notification #04-04 (DOE 2004). The remediation was part of a major accelerated action that included the removal of Building 730, OPWL Tanks T-9 and T-10 (IHSS 132), and contaminated soil associated with IHSSs 118.1 and 144(N) that took approximately 3.5 months to complete (DOE 2005a). A large excavation was required to remove Building 730, the Tanks, and the associated free product. The maximum length of the excavation was approximately 225 ft, the maximum width was approximately 115 ft, and the depth extended well below the bedrock surface. The project started with clearing the area prior to excavation, including removing aboveground steam line stanchions, miscellaneous concrete slabs and structures, asphalt, and groundwater wells. Wells were abandoned in accordance with State Engineer's Office procedures or totally removed. The clean debris was disposed of as sanitary waste. During excavation, OPWL and sanitary lines were encountered and removed. OPWL lines were bagged, tapped and cut, then disposed of as LLW, or as LLMW if they contained lead or had been in contact with solvent-contaminated soil. The ends of the remaining lines (located along the excavation boundary at least 3 ft below final grade) were grouted. Sanitary lines were mostly disposed of as sanitary waste. Process waste lines close to Building 730, which contained radionuclide contamination, were managed as LLW, or as LLMW if they had been in contact with solvent-contaminated soil.

Approximately 1,700 cy of soil and debris were removed. Soil samples for waste management purposes were collected prior to removal at five locations from three intervals (16.5 to 18.5 ft bgs, 18.5 to 20.5 ft bgs, and 20.5 to 22.5 ft bgs). These samples were analyzed for radionuclides and VOCs. Results indicated all radionuclide activities were less than background, with one minor exception. One activity level was slightly above the background mean plus two standard deviations but significantly less than the WRW soil AL (DOE et al. 2003). All VOC concentrations at 16.5 to 18.5 ft were less than the WR soil W ALs, and only one VOC concentration at 18.5 to 20.5 ft was greater than its WRW soil AL. Various VOC concentrations at 20.5 to 22.5 ft, at all five locations, exceeded their WRW soil ALs.

Based on waste characterization data, most of the removed soil was managed as hazardous waste. Soil adjacent to the upper part of Building 730, which contained radionuclide contamination, was managed as LLW. Soil that was adjacent to the bottom of the tanks and in

contact with solvents was managed as LLMW. Soil around the Building 730 structure was removed to between 25 and 28 ft bgs. The excavation extended well below the bedrock surface.

The below-grade Building 730 was demolished in stages, with the Tanks demolished last. Gravel that had been used as backfill around the lowermost part of the structure was also removed and disposed of as LLMW. In addition, the structure's slab under the southern Tanks was broken up and removed. The portion of slab remaining in place is approximately 23 ft by 35 ft. Prior to being broken up, the entire slab was surveyed for radiological contamination. Based on the survey results, the remaining radioactivity was calculated to be 0.04 pCi/g. The total amount of plutonium remaining in the slab is estimated to be 0.0000586 g. Rubble associated with the top of the building was disposed of as sanitary waste. Rubble from the level of the Tanks was disposed of as LLW. The lowermost rubble that was potentially in contact with carbon tetrachloride was managed as LLMW.

Groundwater was encountered throughout the project and was continuously pumped out into water storage tanks along with accumulated water from precipitation. Free product, primarily carbon tetrachloride, was also pumped out of the lowermost part of the excavation, as encountered, into the storage tanks. The water portion of the tank contents was routinely trucked to Building 891 for treatment. Carbon tetrachloride in the bottom of the frac tanks was solidified with absorbent and soil, then packaged and disposed as mixed waste. Frac tanks were size reduced before disposal.

Soil was removed until no free liquids were visible. After structural components, liquids, and soil were removed, four confirmation soil samples (see below) were collected to indicate residual contaminant concentrations (DOE 2005a). Carbon tetrachloride concentrations in confirmation samples collected at depths of 25 to 28 ft bgs ranged from 38 to 5,500 µg/kg, well below the WRW soil AL of 81,500 µg/kg.

The excavation was then backfilled. Backfilling began with the placement of approximately 4 ft of gravel (630 cy), followed by a layer of HRC®, three 8-inch lifts of compacted soil, a second layer of HRC®, three additional 8-inch lifts of compacted soil, and a third and final layer of HRC®. Placement of HRC® was discussed with CDPHE (the LRA) prior to placement. The remaining excavation was then backfilled. Sources of backfill included soil from the upper 16 ft of the excavation and the Trailer 371 area. Soil from the upper 16 ft of the excavation was analyzed, and carbon tetrachloride concentrations were detected at less than 50 ppb. Approximately 4,200 pounds of HRC® were used. After backfilling, the site was graded. The site was reseeded after the removal of Buildings 776, 777, and 778 and the railroad spur to Building 776.

Confirmation sampling was performed after the accelerated action removal activities to determine residual contaminant activities and concentrations. All contaminant activities and concentrations were less than WRW soil ALs (DOE et al. 2003). Of five residual locations (18499 [23.0 ft bgs], CF46-042 [25.0-25.5 ft bgs], CF46-043 [25.0-25.5 ft bgs], CF46-044 [27.0-28.0 ft bgs], and CF46-045 [25.0-25.5 ft bgs]) only 18499 and CF46-044 had detections of americium-241 (0.065 and 3.43 pCi/g respectively) and plutonium-239/240 (0.123 and 12.7 pCi/g) that were greater than background (DOE et al. 2003). All VOCs were at least two orders of magnitude less than WRW soil ALs except for carbon tetrachloride at 5,500 µg/kg (WRW 81,500 µg/kg) at CF46-042 (DOE 2005a).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 2003), an NFAA was justified for IHSS 118.1 based on the following

- A significant source of groundwater contamination was removed.
- Groundwater was evaluated in accordance with the Groundwater IM/IRA (DOE 2005b). Monitoring will continue under the Sitewide IMP.
- Confirmation sampling results were less than WRW soil ALs (DOE et al. 2003).
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 118.1 on April 19, 2005 (CDPHE 2005).

Comments

IHSS 118.1 includes PIC 18.

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 1995, Draft Data Summary 2, Operable Unit 9, Outside Tanks, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

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

DOE, 2004, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #04-04, IHSS Group 700-3, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005a, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005b, Groundwater Interim Measure/Interim Remedial Action, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-118.2

IHSS Number:	118.2
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-3
Unit Name:	Solvent Spills North of Building 707

This Final Update to the HRR for PAC 700-118.2 consolidates the information in the initial HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 118.2 is summarized in this update. The following HRR volume contains IHSS 118.2 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

June 1981

Historical Summary

The location of IHSS 118.2 is shown on Figure 21. IHSS 118.2 is a 20 ft by 30 ft area associated with a 5,000-gallon aboveground carbon tetrachloride tank located adjacent to the northern side of Building 707, in the alleyway between Building 707 and Building 778. In addition to carbon tetrachloride, the tank may have held various degreasing solvents, including petroleum distillates, benzene and dichloromethane paint thinner, 1,1,1-trichloroethane, and methyl ethyl ketone.

Numerous releases occurred during routine filling operations. The most significant release occurred in June 1981 when the tank ruptured and released an unknown quantity of carbon tetrachloride to the environment. The tank and the area of the spill were subsequently cleaned up. However, no documentation was found regarding sampling and analysis to verify the removal of contaminated soil.

IHSS Investigations

A soil gas survey conducted during the OU 8 RFI/RI detected carbon tetrachloride (range 5-1,000 μg/L), tetrachloroethene (range 0.14-2.7 μg/L), toluene (range 0.11-2.7 μg/L), trichloroethene (range 1.8-17 μg/L), chloroform (range 2.3-28 μg/L), benzene (range 0.05-3.7 μg/L), and chloromethane (range 0.61-1.5 μg/L) at concentrations greater than 1 μg/L (DOE 1995). In addition, americium-241 was detected above background in one surface soil sample with an activity of 0.026 pCi/g (SS810093).

Surface and subsurface soil samples were also collected from eight sampling locations within PAC 700-150.7 in the vicinity of IHSS 118.2 during the IHSS Group 700-3 accelerated action soil characterization. Sampling and analysis was conducted in accordance with RFCA (DOE et al. 1996) IASAP Addendum #IA-03-04 (DOE 2003). Based on the extensive soil gas data indicating low VOC concentrations, the samples were only analyzed for radionuclides. All activities were less than WRW soil ALs (DOE et al. 2003, DOE 2005).

No Further Action Recommendation

Historical and accelerated action data from IHSS 118.2 indicate that contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003). Results of the SSRS and the stewardship evaluation indicate additional action is not necessary.

In accordance with RFCA (DOE et al. 2003), an NFAA was justified for IHSS 118.2 based on the following

- Analytical results were less than WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 118.2 on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 1995, Draft Data Summary 2, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, 700-3 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-123.1

IHSS Number:	123.1
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	Not Applicable
Unit Name:	Valve Vault 7

This Final Update to the HRR for PAC 700-123.1 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 123.1 is summarized in this update. The following HRR volumes contain IHSS 123.1 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 2000 Annual (DOE 2000a);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

April 4, 1983

Historical Summary

IHSS 123.1 is the result of leaks from Valve Vault 7 to surrounding soil. Valve Vault 7 was part of RCRA Unit 374.3 (DOE 2005a). Valve Vault 7 was located to the southwest of Building 707, adjacent to the northern side of the PA inner fence as shown on Figure 21. Valve Vault 7 controlled the 800 Area NPWL. On April 4, 1983, a check valve in Valve Vault 7 malfunctioned, allowing process wastewater to backflow into the sump. The vault filled with process wastewater and overflowed. The high-water-level alarm system in Valve Vault 7 was apparently inoperative at the time of the overflow. The process wastewater drained into an adjacent storm runoff collection system ditch near Eighth Street and Sage Avenue and flowed east toward South Walnut Creek and the B-Series Ponds (PACs NE-142.5 -142.9). Runoff was observed flowing across the former 750 parking lot and through the normal Building 991 runoff drainage (DOE 1992).

The release consisted of process wastewater from the 800 and 400 Areas which typically contained uranium, solvents, oils, beryllium, nitric acid, hydrochloric acid, and fluoride (DOE 1992).

The transfer of liquid waste from the holding tanks at Building 881 was discontinued after personnel verified that wastewater was flowing out of Valve Vault 7. Temporary dikes were constructed to contain the overflow. A dam was constructed in the ditch east of the guard shack at Portal 1 and another dam was placed just west of Guard Shack 762. Drainage from the area was diverted to Pond B-1. Attempts were made to remove oil by using chemical absorbent bats. Environmental samples were collected from the vault. Water was pumped out of the vault and

the containment dikes and transferred to Waste Processing by tanker truck. Snowmelt water was retained in the ditch for several days and later transferred to Process Waste Storage (DOE 1992).

The malfunctioning check valve was replaced, the sump pump was replaced, and repair of the electrical system was initiated. A new type of check valve was ordered for all the check valves in the waste transfer system. The ditch along Sage Avenue between Valve Vault 7 and Ninth Street was cleaned of all visible contamination. The excavated material was stored for drying in the Building 771 parking lot (DOE 1992).

The runoff diversion activities were partially successful. Oil from the spill was visible in Pond B-1. A small amount of oil was observed in Pond B-4 and Pond B-5. All visible contamination was excavated from the ditch along Ninth Street (DOE 1992). No documentation was found that detailed the complete removal of release constituents from the site. Analysis of water samples from Pond B-1 and Pond B-4 one week following the incident indicated normal pH, and no concentrations of oil, nitrate, or radioactivity. Evaluation of data for Pond B-5, the only pond that discharged offsite during that period, did not indicate material from the spill. Valve Vault 7 was removed (2005b).

IHSS Investigations

As part of the Phase I RFI/RI Work Plan for OU 8 (DOE 1995a), IHSS 123.1 was sampled at seven locations for metals, radionuclides, VOCs, and SVOCs. Validated data from these locations were compared to PRGs and background concentrations (if applicable) in use at the time. Only benzo(a)pyrene at two locations, ranging from 93 to 160 µg/kg, exceeded the background and/or PRG (87.7 µg/kg) in use in 1995. Thus sampling indicated that no current or potential source exists. The data were originally reported in Draft Data Summary 2, OU 8, 700 Area, Table 3-7 (DOE 1995b) and were also reported in the 2000 HRR (DOE 2000a) and 2000 Interim Update (DOE 2000b).

No Further Action Recommendation

Evaluation of IHSS 123.1 for NFA status is based on data presented in the Draft Data Summary 2 for OU 8 (DOE 1995b). All analyses were below subsequently established RFCA Tier II soil ALs (DOE et al. 1996) and at or below established background levels for radionuclides (DOE 2004). No current or potential source of contamination was identified. IHSS 123.1 was proposed for NFA in the 1997 Annual Update to the HRR (DOE 1997). The recommendation for NFA at this site was consistent with the criteria for recommending NFA decisions presented in RFCA (DOE et al. 1996).

In a letter dated July 9, 1999 (CDPHE and EPA 1999), regarding the 1997 NFA proposal, CDPHE and EPA requested additional information regarding IHSS 123.1 because the reference in the 1997 HRR to Data Summary 2, OU 8 (DOE 1995b) was inaccurate. The 1995 data were provided to the agencies in the HRR (Interim Update) (DOE 2000b) and IHSS 123.1 was again submitted for NFA approval in the 2000 Annual Update (DOE 2000a). CDPHE (the LRA) reviewed the 1995 data and granted NFA status to IHSS 123.1 in a letter dated October 2, 2001 (CDPHE 2001). The IHSS was reviewed at the NFA Status Meeting of October 24, 2001 and final NFA status was conferred at the NFA Status Meeting of November 14, 2001. A letter dated February 14, 2002, published in the 2002 Annual Update to the HRR (DOE 2002), documented the CDPHE and EPA approval (CDPHE and EPA 2002).

Comments

None

References

CDPHE, 2001, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Annual Update for the Historical Release Report, September 2000, October 2.

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE-RFFO, from S.H. Gunderson, CDPHE and T. Rehder, EPA, RE: Annual Update for the Historical Release Report (September 1997), Rocky Flats Environmental Technology Site, Golden, Colorado, July 9.

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE and T. Rehder, EPA, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 1995a, Final Phase I RFI/RI Work Plan, 700 Area, Operable Unit No. 8, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 1995b, Draft Data Summary 2, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000a, Annual Update Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000b, Historical Release Report (Interim Update), Response to Comments for HRR Annual Updates (1997, 1998 & 1999), Kaiser-Hill Company, L.L.C., Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2001, Annual Update Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Industrial Area and Buffer Zone Sampling and Analysis Plan, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005a, Summary Report for Closure of RCRA Unit 374.3, The 700-800 Area Process Waste Transfer System, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005b, Closeout Report for IHSS Group 000-4, New Process Waste Lines (NPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 700-123.2

IHSS Number:	123.2
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	000-2
Unit Name:	Valve Pit West of Building 707

This Final Update to the HRR for PAC 700-123.2 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. IHSS 123.2 overlapped with PAC 700-150.5. IHSS 150.5 was proposed in the 1998 HRR Update (DOE 1998) for NFA because IHSS 123.2 is the actual contamination site. IHSS 150.5 was accepted for NFA in 1999 and was removed from maps (CDPHE 1999).

The disposition of IHSS 123.2 is summarized in this update. The following HRR volume contains IHSS 123.2 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1953 to 1984

Historical Summary

IHSS 123.2 was the result of documented leaks in the area west of Building 707 related to the overflow of an OPWL valve pit. The location of IHSS 123.2 is shown on Figure 21. The OPWL valve pit west of Building 707 was supposed to have been removed in March 1973 (DOE 1992); however, the Addendum to the OU 9 Field Sampling Plan states that the vault, with no pipeline connections, was inspected as late as 1994 (DOE 1994). Two OPWL pipelines, P-14 and P-15, connected to the vault. P-14 was constructed in 1952 and abandoned in 1968 because of the construction of Building 707. P-15 was its replacement, installed in 1968 and abandoned in 1984 (DOE 1994). Removal of the upper part and grouting of the remaining OPWL valve pit was confirmed in 2005 (DOE 2005). P-15 was also grouted in this area, P-14 was not present (DOE 2005).

OPWL lines west of Building 707 contained and may have leaked process wastewater from Building 123 and the 800 and 400 Areas. The wastewater may have contained acids, bases, solvents, radionuclides, metals, and other wastes including oils, cleaning compounds, ethylene glycol, fluoride, trace PCBs, and ammonium thiocyanate (DOE 1994).

In December 1958, a leak occurred at a process waste line elbow in the valve vault. Process waste followed the containment pipe and flowed into a ditch northeast of Building 707. Up to 1,350 gallons of process waste were released at the time of this occurrence (DOE 1994). The waste associated with this release contained 0.51 ppm of enriched uranium and 120 ppm of nitrate. A soil sample collected just south of Building 777 (near the ditch at the northeastern end of the suspected P-14 location) had a plutonium activity of 0.485 dpm (DOE 1994). No documentation was found that further details response to this occurrence. The elbow was

repaired and the line remained in use for another 10 years. Other leaks occurred because of joint expansion following the introduction of steam condensate from Building 881 (DOE 1994). In March 1973, this valve vault was replaced.

IHSS Investigations

The OPWL valve pit associated with IHSS 123.2 was removed (DOE 2005). OPWL P-14, which was reported connected to this manhole, was not found. OPWL P-15 was grouted and left in place. Characterization samples were collected in accordance with RFCA (DOE et al. 1996) IASAP Addendum #IA-03-11 (DOE 2003) at IHSS 123.2 and along the suspected location of P-14 as reported in the Closeout Report for IHSS Group 000-2 OPWL (DOE 2005). One sample was collected in the IHSS and one adjacent to the IHSS along the suspected P-14 location. Detected analytes greater than background included: uranium-234 (range 3.284-3.669 pCi/g), uranium-235 (range 0.196-0.254 pCi/g), uranium-238 (range 1.997-3.669 pCi/g), barium (range 1,210-989 mg/kg), strontium (217.0 mg/kg), and several SVOCs (all at least one order of magnitude less than WRW soil ALs). All concentrations and activities were well below RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

IHSS 123.2 was proposed for NFAA because of the following:

- All radionuclide, SVOCs, and metal activities and concentrations were less than RFCA WRW soil ALs.
- The SSRS indicated that soil removal was not necessary because the area was not subject to erosion.
- The stewardship evaluation indicated soil removal was not necessary because monitoring data did not indicate groundwater or surface water impacts from IHSS 123.2.

After review of the Closeout Report for IHSS Group 000-2 (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 123.2 on October 6, 2005.

Comments

IHSS 123.2 overlapped with PAC 700-150.5. IHSS 150.5 was proposed in the 1998 HRR Update (DOE 1998) for NFA because IHSS 123.2 is the actual contamination site. IHSS 150.5 was accepted for NFA in 1999 and was removed from maps (CDPHE 1999).

References

CDPHE, 1999, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Annual Update for the Historical Release Report (September 1998), July 9.

CDPHE, 2005, Correspondence to J. Rampe, DOE RFFO from D. Kruchek, CDPHE, RE: Closeout Report for IHSS Group 000-2, Original Process waste Lines (OPWL) – NFAA Approval, October 6.

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

DOE, 1994, Draft Final Technical Memorandum No. 1, Volume II - Pipelines, Addendum to Phase I RFI/RI Work Plan, Field Sampling Plan, Original Process Waste Lines, (Operable Unit No. 9), Rocky Flats Environmental Technology Site, Golden, Colorado, November.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-124.1, 700-124.2, 700-124.3

IHSS Numbers:	124.1, 124.2, and 124.3
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	700-4
Unit Name:	124.1 – 30,000-Gallon Tank (Tank 68) 124.2 – 14,000-Gallon Tank (Tank 66) 124.3 – 14,000-Gallon Tank (Tank 67)

This Final Update to the HRR for PACs 700-124.1, 700-124.2, and 700-124.3 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 124.1 through 124.3 is summarized in this update. The following HRR volumes contain information relevant to IHSSs 124.1 through 124.3:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1952 to 1989 and specifically July 1981

Historical Summary

IHSSs 124.1, 124.2, and 124.3 consisted of three underground tanks on the southeastern side of Building 774. The location of IHSSs 124.1, 124.2, and 124.3 is shown on Figure 21. In addition to the IHSS designation used here, each tank had a number used within the building and an OPWL number. IHSS 124.1 consisted of Tank 68, also called OPWL Tank T-14. It was a 30,000-gallon tank, was constructed in late 1958, and was the southernmost of the three tanks (DOE 1992).

IHSSs 124.2 and 124.3 were identical, twinned 14,000-gallon tanks that shared a common internal wall. They were referred to as Building 774 Tanks 66 and 67 and OPWL Tanks T-16S (south) and T-16N (north) and appear on an engineering drawing dated 1953. They were separate from and located 2 ft north of Tank 68. Because the top of Tanks 66 and 67 was at ground level, a shed was constructed above them with bay doors facing east and west. Access to the tanks was possible through the floor of the shed (DOE 1992).

All three tanks were constructed of reinforced concrete with walls approximately 10 inches thick. The tanks are shown on Plant Drawing 1-5392-74 as located east of Building 774. The IAG (CDPHE et al. 1991) also described a “holding tank” that was subsequently identified as IHSS 700-125 in the HRR (DOE 1992). IHSS 125 is equivalent to IHSS 124.2 (Tank 66); therefore, discussion of IHSS 124.2 in this write-up also addresses IHSS 125. Accordingly, the write-up for PAC 700-125 references this discussion.

The main function of Tanks 66 and 67 was to receive treated liquid decanted from the second-stage batch precipitation process in Building 774. According to personnel interviewed for the

development of the RCRA Tank Closure Plan (Rockwell 1989), the tank floors were cleaned, sandblasted, and coated with eight coats of Amercoat No. 55 in 1956. Details regarding the processes that created the waste destined for the tanks are provided in the RCRA Tank Closure Plan. The tanks were taken out of service in September 1989 because they did not meet the requirements for permitting (DOE 1992).

In July 1981, Tank 66 overflowed, spilling an estimated 500 gallons of liquid waste. A second source states that during the week ending July 17, 1981, approximately 3,300 gallons of process wastewater overflowed a tank in Building 774 and approximately 50 gallons ran onto the asphalt driveway. Another source states that this spill involved between 50 and 100 gallons of liquid that contaminated the ground east of Building 774. The area east of Building 774 was paved following the overflow of Tank 66 in 1981. The contamination may not have been removed prior to paving (DOE 1992).

The released process wastewater was high in nitrate and contaminated with approximately 40,000 dpm/L plutonium. Another source states that the liquid released in the overflow incident was high in nitrate, contained plutonium and uranium, and measured approximately 30,000 dpm/L. An analytical report of the process wastewater released from the July 1981 Tank 66 spill indicated total alpha activity at 7.8×10^4 pCi/L, total beta activity at 4.6×10^4 pCi/L, nitrate at 5.6×10^3 mg/L, and a pH of 12 (DOE 1992).

Tanks 66, 67, and 68 were addressed in the Accelerated Action Plan for IAG Underground Storage Tanks Containing RCRA-Regulated Materials (DOE 1995) and the Final PAM for the Contaminant Stabilization of Underground Storage Tanks (DOE 1996b), both of which are documents that specifically address the accelerated removal action and stabilization of potential contaminants in seven IAG underground tank systems. In accordance with the Accelerated Action Plan and PAM, the contents of these tanks were removed, the tanks were multi-rinsed, and an inert material (polyurethane foam) was used to stabilize any remaining contamination (DOE 1996c).

Removal of Tanks 66, 67, and 68 (foamed) was initiated in October 2003 in accordance with the Building 771 Closure Project Decommissioning Operation Plan (DOP) (DOE 2003).

IHSS Investigations

The nature and extent of contamination was characterized through a RFCA (DOE et al. 1996) accelerated action carried out in accordance with IASAP Addendum #IA-03-01 for IHSS Group 700-4 (DOE 2002), which includes IHSSs 124.1, 124.2, and 124.3 (Tanks 66, 67, and 68). Soil characterization samples were collected and analyzed after the Tanks were removed. Analytical results indicated americium-241 activities ranged from 168.9 pCi/g to 6.115 nCi/g and plutonium-239/240 activities ranged from 1,367 pCi/g to 49.4 nCi/g in subsurface soil beneath Tanks 66 and 67. Analytical results from soil beneath Tank 68 indicated that all concentrations and activities were less than RLs except for molybdenum and silver which were less than background values. Notification of the intent to remove soil under Tanks 66 and 67 is documented in an RCR dated October 28, 2003.

Subsequently approximately 2,112 ft^3 of soil and fill were removed from beneath Tanks 66 and 67 in November 2003. Confirmation samples were collected at six locations and indicated americium-241 activities ranged from 6.57 to 226 pCi/g and plutonium-239/240 activities ranged from 5.68 to 179.38 pCi/g. The combined activities at all locations were less than WRW soil

ALs (DOE et al. 2003) within 3 ft of the surface and less than 1 nCi/g at approximately 4 ft in depth. The excavation was backfilled (RCR dated November 26, 2003). Characterization and confirmation sampling results are described in the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b).

No Further Action Recommendation

NFAA was recommended for IHSSs 124.1, 124.2, and 124.3 based on the following:

- Radionuclide-contaminated soil was removed from the IHSSs.
- Confirmation sampling results indicated that residual activities in subsurface soil were less than RFCA WRW soil ALs within 3 ft of the surface and less than 1 nCi/g at a depth greater than 3 ft.
- Results of the SSRS and stewardship evaluation indicated that additional action was not necessary. The area is not susceptible to high erosion.

After review of the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSSs 124.1, 124.2, and 124.3 (Tanks 68, 66, and 67, respectively) on February 6, 2004 (CDPHE 2004).

Comments

The IAG (CDPHE et al. 1991) described a “holding tank” that was subsequently identified as IHSS 700-125 in the HRR (DOE 1992). IHSS 125 is equivalent to IHSS 124.2 (Tank 66); therefore, discussion of IHSS 124.2 in this write-up also addresses IHSS 125. Accordingly, the write-up for PAC 125 references this discussion.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4 (B771 & 774) - Approval, Rocky Flats Environmental Technology Site, Golden, Colorado, February 6.

CDPHE, DOE, and EPA, 1991, Rocky Flats Interagency Agreement, Rocky Flats Plant, Golden, Colorado, January 22.

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

DOE, 1995, Accelerated Action Plan for Interagency Agreement Underground Storage Tanks Containing RCRA-Regulated Materials, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

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

DOE, 1996b, Final Proposed Action Memorandum for the Contaminant Stabilization of Underground Storage Tanks, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1996c, Completion Report for the Underground Storage Tanks Source Removal Project, Volume 1, Rocky Mountain Remediation Services, LLC, Environmental Restoration, Rocky Flats Environmental Technology Site, September 23.

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2003, 771 Closure Project Decommissioning Operation Plan, Modification 5, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2004a, Annual Update, Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-125

IHSS Number:	125
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	700-4
Unit Name:	Holding Tank (Tank 66)

PAC 700-125 was originally defined in the IAG as a "holding tank" (CDPHE et al. 1991). Subsequent research indicated that was the same as PAC 700-124.2, Tank 66 (OPWL Tank T-16N [north]) (DOE et al. 1996).

Therefore, IHSS 125 is addressed as part of the discussion for PACs 700-124.1 through 700-124.3.

References

CDPHE, DOE, and EPA, 1991, Rocky Flats Interagency Agreement, Rocky Flats Plant, Golden, Colorado, January 22.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBERS: 700-126.1 AND 700-126.2

IHSS Numbers:	126.1 and 126.2
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	700-4
Unit Name:	126.1 – Westernmost Out-of-Service Process Waste Tank 126.2 – Easternmost Out-of-Service Process Waste Tank

This Final Update to the HRR for PAC 700-126.1 and PAC 700-126.2 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 126.1 and 126.2 is summarized in this update. The following HRR volumes contain information relevant to IHSSs 126.1 and 126.2:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Approximately 1953 to 1984 (period of operation of the process waste tanks)

Historical Summary

IHSSs 126.1 and 126.2 consist of two out-of-service process waste tanks housed below grade in Building 728. Building 728 referred to the combined tanks as Tank 8. The locations for PACs 700-126.1 and 700-126.2 are shown on Figure 21. The tanks were built in 1952 and each had an operating capacity of approximately 20,000 gallons and a maximum design capacity of 25,000 gallons. The tanks stored laundry water from the Building 771 laundry facility, which ceased operations in the late 1950s. After being taken out of service in 1984, the tanks were converted to contain fire suppression deluge overflow for Building 771 plenums. The tanks leaked, allowing groundwater to periodically flow into the tanks; the groundwater was then pumped into the process waste system (DOE 1992). The tanks overflowed several times during use.

Each of the two out-of-service process waste tanks was constructed of reinforced concrete. The combined exterior tank dimensions were 33 ft 6 inches (east-west) by 23 ft 5 inches (north-south) and they were 11 ft 8 inches high. The ceiling and wall thicknesses were 10 inches and the floor thickness was 1 ft. The tanks shared the inner wall. The bottom elevation of the tanks' interior was at 5,931 ft. The tanks were designed with a minimum cover of 3 ft of fill except for the area overlain by the building. The original design indicated two pipes entered each tank from the south, OPWL P-24 and P-22 (PAC 000-121). The invert elevations of the pipes where they entered the tanks were 5,939 and 5,938 ft. The volume of material that could have remained in the tanks below the level of the outlet pipes is unclear from the design drawings (DOE 1992).

The pump house (Building 728) was a concrete structure situated directly above the tanks with dimensions of 14 ft 10 inches (east-west) by 7 ft 10 inches (north-south) and was 7 ft 6 inches

high. The southern wall of the pump house was above the southern wall of the tanks. It contained the manholes for access into the tanks and one sump pump for each tank, as well as one sampling point into each tank. The pump house was partially underground, and thus did not appear as large as its dimensions indicate (DOE 1992).

The liquid process wastes stored in the tanks likely contained nitrate, plutonium, uranium, and various other organic and inorganic constituents.

IHSS Investigations

A RFCA (DOE et al. 1996) accelerated action was carried out in accordance with IASAP Addendum #IA-03-01 for IHSS Group 700-4 (DOE 2002). Two soil characterization samples (locations CE49-000 and CF49-007) targeting IHSSs 126.1 and 126.2 were collected as part of accelerated action activities for IHSS Group 700-4 in Fall 2003. Samples were analyzed for radionuclides, metals, and nitrate. Results indicated barium (598.0 and 613.0 mg/kg), chromium (54.2 mg/kg), copper (134.0 and 240.0 mg/kg), iron (25,800.0 mg/kg), lead (63.9 mg/kg), manganese (407.0 mg/kg), nickel (35.0 mg/kg), strontium (215.0 mg/kg), vanadium (102.0 and 142.0 mg/kg), zinc (431.0 mg/kg), and uranium-234 (3.201 and 4.204 pCi/g), uranium-235 (0.404 pCi/g), and uranium-238 (3.201 and 4.204 pCi/g) were detected at concentrations greater than background but less than WRW soil ALs (DOE et al. 2003). Analytical results from the characterization are presented in the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b).

Building 728, and Tank 8 were removed as part of the Building 771 Closure Project (DOE 2005a). The P-22 OPWL that terminated in Building 728 was foamed and grouted from the Building 728 excavation to a refusal penetration of 10 ft. The P-24 OPWL was foamed and grouted to a refusal penetration of 35 ft. The P-23 OPWL was grouted to a refusal penetration of 50 ft in the inner pipe and 30 ft in the outer pipe (DOE 2005a, b).

No Further Action Recommendation

Based on analytical results and the SSRS, an NFAA determination was justified for IHSSs 126.1 and 126.2 as presented in the ER Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b) because of the following:

- Analyte concentrations and activities were less than WRW soil ALs.
- Results of the SSRS and stewardship evaluation indicated that additional action was not necessary because erosion of soil at this location was not likely to affect surface water.

After review of the ER Notification and Closeout Report for IHSS Group 700-4 by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSSs 126.1 and 126.2 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4 (B771 & 774) - Approval, February 6.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005a Decommissioning and Closeout Report, 771 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005b, Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-127

IHSS Number:	127
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	000-2
Unit Name:	Low-Level Radioactive Waste Leak

This Final Update to the HRR for PAC 700-127 consolidates the information in the initial HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 127 is summarized in this update. The following HRR volume contains IHSS 127 information:

Original Report – 1992 (DOE 1992).

Dates(s) of Operation or Occurrence

October 1957 to 1971

Historical Summary

IHSS 127, an area in which low-level radioactive waste leaked from OPWL, is north of Tank 207 as shown on Figure 21. The location of IHSS 127 as defined in the IAG (CDPHE et al. 1991) did not correspond with the location of any process waste lines on RFETS utility drawings. The HRR (DOE 1992) indicates the location of the process waste line between Building 774 and Building 995 is approximately 70 ft west of the previously identified IAG location. It was proposed that the location of IHSS 127 be redefined to coincide with the location of the process waste line discussed as PAC 700-127 (OPWL P-28) (DOE 2005).

Persons interviewed for the CEARP recalled construction activities near Building 774 and west of Pond 207-C that resulted in breaking a low-level radioactive waste discharge line several times. This line carried liquids from the process waste treatment facility (Building 774) to the sanitary wastewater treatment plant (Building 995) (DOE 2005).

On October 14, 1957, a line that carried process waste between Building 774 and a 200,000-gallon waste holding tank (Tank 207) leaked at a joint. It was determined that the joint had not been properly packed during construction. The joint was repaired and the excavation backfilled by November 5, 1957. Another leak was detected in 1971 when the waste line between Building 774 and Building 995 was pressure-tested. The liquid waste that flowed from Building 774 to Building 995 was high in nitrate and had small amounts of plutonium. In April 1982, the leaking section of line was replaced (DOE 2005).

A soil sample collected in 1976 from a depth of 4 ft beside the leak area, north of Tank 207 and south of Building 774, was analyzed and found to contain 76 mg/kg ("76 ppm" in original source) nitrate and 1.83 dpm/g plutonium (DOE 1992).

IHSS Investigations

IHSS 127 and P-28 were investigated as part of the IHSS Group 000-2 RFCA (DOE et al. 1996) accelerated action activities, which were planned and executed in accordance with IASAP

Addendum #IA-03-11 (DOE 2003a) and ER RSOP Notification #03-14 (DOE 2003b). Three subsurface samples were collected in IHSS 127 and several more were collected in the immediate vicinity as part of the IHSS Group 000-2, 700-3, 700-4, and 700-7 ER projects. In total, 67 locations were sampled in the Tank 207 area, including 56 characterization locations and 11 confirmation locations. Detections of radionuclides at activities greater than RFCA WRW soil ALs (DOE et al. 2003) were reported in soil samples at one sampling location (DOE 2005).

Americium-241 was reported at an activity of 388 pCi/g (WRW soil AL is 76 pCi/g) and plutonium-239/240 was reported at 99.3 pCi/g (DOE 2005) at sampling location CH47-044. All other analyte concentrations and activities were less than WRW soil ALs.

As part of the Tank 207 remediation, two excavations of radionuclide-contaminated surface soil and subsurface soil from the valve vault and manway area north of the tank were conducted. The northern most excavation was approximately 7 ft by 9 ft and 1 ft deep. The largest excavation in the Tank 207 area was completed directly north of the former tank. The excavation in this area was approximately 37 ft by 58 ft and 4.5 ft deep. Results of confirmation samples indicate that both areas were successfully remediated (DOE 2005).

The P-28 OPWL extended north from Tank 207. P-28 was completely filled with grout from the Tank 207 excavation north to the grout plug approximately 60 ft south of Tanks 14 and 16 (PACs 700-124.1, 124.2, and 124.3). The P-29 OPWL that was thought to extend north from Tank 207 was not found (DOE 2005).

No Further Action Recommendation

As a result of the accelerated actions performed, an NFAA was justified for IHSS 127 in the Closeout Report for IHSS Group 000-2 (DOE 2005) based on the following:

- The potential sources of contamination in IHSS 127 at concentrations greater than RFCA WRW soil ALs were removed.
- Residual contaminant concentrations are below RFCA WRW soil ALs.
- Tank 207 was removed, eliminating this area as a potential source of future contaminant releases.
- P-28 was grouted, further eliminating potential future releases of contamination.
- In accordance with the SSRS, subsurface soil in the area is not subject to significant erosion.
- All RFCA Attachment 14 criteria were met.

After review of the Closeout Report for IHSS Group 000-2 (DOE 2005) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the NFAA status for IHSS 127 on October 6, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Rampe, DOE RFFO from D. Kruchek, CDPHE, RE: Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL) –NFAA Approval, October 6.

CDPHE, DOE, and EPA, 1991, Rocky Flats Interagency Agreement, Rocky Flats Plant, Golden, Colorado, January 22.

DOE, 1990, First Draft Phase I RFI/RI Work Plan Operable Unit No. 5, Rocky Flats Plant, Golden. Colorado, July 23.

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

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-11, IHSS Group 000-2, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003b, FY03 ER RSOP Notification #03-14 for IHSS Group 000-2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005, Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-131

IHSS Number:	131
Current Operable Unit:	IA
Former Operable Unit:	14
IHSS Group:	700-3
Unit Name:	Radioactive Site 700 Area No. 1

This Final Update to the HRR for PAC 700-131 consolidates the information in the initial HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 131 is summarized in this update. The following HRR volume contains IHSS 131 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

June 1964 and May 1969

Historical Summary

IHSS 131 lies north of Building 776, the location is shown on Figure 21. In June 1964, an explosion in Building 776 resulted in the release of plutonium. One account claimed that an area approximately 1,500 ft^2 adjacent to the Building 776 gas-bottle dock was affected (western end of the northern side of Building 776). Radiological surveys showed activities exceeding 300,000 dpm/100 cm^2. A later account claimed that an area of approximately 40 ft^2 north of Building 776 was affected. Soil from the area with the highest counts was removed, a seal coat of oil was applied, and approximately 2 inches of gravel were added (DOE 1992).

Approximately 2,000 ft^2 on the western end of the northern side of Building 776 was affected by the release of plutonium as a result of firefighting activities during the 1969 fire in Building 776. Radiological surveys detected plutonium contamination along three northern exterior walls of Building 776. Plutonium was tracked out of Door 17 (center of northern side of Building 776) by the firefighters during the blaze. To reduce mobility of the contaminated soil, the area around Door 17 was paved twice with asphalt. In fall 1971, the asphalt was removed and placed in barrels. New asphalt was later placed in the area of Door 17 (DOE 1992).

IHSS Investigations

HPGe surveys conducted during the OU 14 Phase I RFI/RI did not indicate elevated activities of radionuclides. NaI surveys indicated radionuclides exceeded background in the northwestern corner, and south-central and north-central portions of the IHSS. Twenty-one surface soil samples collected as part of the OU 14 RFI/RI indicated radionuclides, metals, and SVOCs exceeded background values or MDLs. However, all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 1995, 2005).

Surface and subsurface samples were also collected from 10 sampling locations within IHSS 131 as part of RFCA (DOE et al. 1996) IHSS Group 700-3 accelerated action soil characterization. Sampling and analysis was conducted in accordance with IASAP Addendum #IA-03-04

(DOE 2003). Samples were analyzed for radionuclides, metals, VOCs, and SVOCs. Contaminant activities and concentrations were less than WRW soil ALs, with the following five exceptions in subsurface soil (DOE 2005):

- Benzo(a)pyrene concentrations in subsurface soil at sampling location CF46-021 (5,200 µg/kg at 2.5 - 4.5 ft and 5,200 µg/kg at 4.5 - 6.5 ft) exceeded the WRW soil AL of 3,490 µg/kg.
- The arsenic concentration in subsurface soil (4.5 - 6.5 ft) at sampling location CF46-025 was 38 mg/kg, exceeding the WRW soil AL of 22.2 mg/kg.
- The arsenic concentration in subsurface soil (4.5 - 6.5 ft) at sampling location CF46-027 was 44 mg/kg, exceeding the WRW soil AL of 22.2 mg/kg.
- The chromium concentration in subsurface soil (4.5 - 6.5 ft) at sampling location CF46-027 was 11,000 mg/kg, exceeding the WRW soil AL of 268 mg/kg. Additional sampling was conducted during the Building 776/777 demolition and chromium was not detected at concentrations greater than RFCA WRW soil ALs. It was determined that this was a small, isolated occurrence and remediation was not necessary.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 2003), an NFAA was justified for IHSS 131 based on the following

- Historical and accelerated action data indicated that residual COC activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with five exceptions in subsurface soil.
- Results of the SSRS did not indicate additional action was necessary. Elevated concentrations are located at least 4.5 ft bgs, and the area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 131 on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 1995, Draft OU 14 Data Summary No.1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, 700-3 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-132

IHSS Number:	132
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	700-3
Unit Name:	Radioactive Site 700 Area, Site No. 4 (Tanks T-9 and T-10)

This Final Update to the HRR for PAC 700-132 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 132 is summarized in this update. The following HRR volumes contain IHSS 132 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 1997 (DOE 1997).

Date(s) of Operation or Occurrence

1955 to 1984

Historical Summary

IHSS 132 consists of the area around OPWL Tanks T-9 and T-10 and Building 730 that housed the tanks. Tanks T-9 and T-10 (also known as Tanks 776A/776C and 776B/776D) were located in the 700 Area beneath Building 730, which was referred to as the Building 776 Process Waste Pit. These tanks were approximately 50 ft north of Building 776 and approximately 30 ft east of Building 701, and were designated as IHSS 132. The location of IHSS 132 is shown on Figure 21. Tank T-9 consisted of one 22,500-gallon underground concrete tank and one 4,500-gallon concrete UST. Tank T-10 consisted of one 22,500-gallon concrete underground tank and one 4,500-gallon concrete UST. The T-9 tanks were installed in 1955 and were taken out of service in October 1984, at which time both chambers were cleaned, painted, and converted to plenum deluge catch tanks. These tanks originally received laundry waste from Building 778. The T-10 tanks were installed in 1955 and were abandoned in December 1982; however, these tanks reportedly were not cleaned when abandoned. Tank T-10 received waste streams from Building 776, Production Support, and Building 778, the Laundry (DOE 2005a).

Waste streams for both sets of tanks included radionuclides, solvents, metals, and limited amounts of machinery and lubricating oils. Documented releases from Tanks T-9 and T-10 were not found; however, releases from the tanks were considered likely because of their condition. Furthermore, numerous releases were documented from a previously removed UST adjacent to Building 730 that contained solvents including carbon tetrachloride and possibly tetrachloroethene (DOE 2005a). This tank was reportedly located approximately 9.0 to 10.0 ft below grade (refer to PAC 700-118.1).

IHSS Investigations

Historical soil data below are presented in the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005a).

The area was investigated as part of the OU 8 (700 Area) and OU 9 (Outside Tanks) Phase I RFI/RIs (DOE 1995a, 1995b). HPGe surveys conducted during the OU 9 Phase I RFI/RI indicated that americium-241 and plutonium-239/240 activities exceeded background. One NaI location registered levels of 1,687 cpm with background of 1,595 cpm. Activities of americium-241 and plutonium-239/240 were above background at various depths at all borehole locations. Various metals were detected at boreholes around the tanks at concentrations greater than background.

Soil samples were collected around Tanks T-9 and T-10 (IHSS 132) just east of IHSS 118.1. Subsurface soil sampling results indicated VOCs and particularly carbon tetrachloride was present in subsurface soil with maximum concentrations from 20.0 to 22.5 ft in depth. At this depth carbon tetrachloride was present at concentrations ranging from 720 to 250,000,000 µg/kg. Other VOCs at this depth with elevated concentrations include acetone, 1,1,2,2-tetrachloroethane, and chloroform.

A pre-RI of IHSS 118.1 was conducted in 1997 to determine the nature and extent of contamination at IHSS 118.1. Results of this investigation confirmed the presence of DNAPLs in this area. Subsurface soil samples collected from 20 to 25 ft in depth indicated carbon tetrachloride was present at concentrations as high as 390,000 µg/kg. Investigation results determined that the carbon tetrachloride was a DNAPL that pooled on the bedrock below the Tanks T-9 and T-10.

Sample results from liquid inside both tanks at Tank T-9 indicated positive activity for all radionuclides analyzed except for radium-226 (DOE 1995b). Sample results from liquid inside one of the Tank T-10 tanks indicated positive activity for all radionuclides tested for and elevated concentrations of calcium, copper, lithium, manganese, nickel, strontium, and zinc. Sample results from the other Tank T-10 tank indicated activity for all radionuclides analyzed for except radium-226 and gross alpha and elevated concentrations of lithium and zinc.

Based on historical knowledge and data, soil around Tanks T-9 and T-10 (IHSS 132) was not sampled as part of the IHSS Group 700-3 accelerated action characterization. Building 730, the tanks, and contaminated soil from IHSSs 118.1 and 700-144(N) were to be removed, therefore characterization was not necessary.

IHSS 132, along with IHSSs 118.1 and 144(N), was remediated through a RFCA accelerated action (DOE et al. 1996) in accordance with ER RSOP Notification #04-04 (DOE 2004). The remediation was part of a major accelerated action that included the removal of Building 730, OPWL Tanks T-9 and T-10 (IHSS 132), and contaminated soil associated with IHSSs 118.1 and 144(N) that took approximately 3.5 months to complete (DOE 2005a). A large excavation was required to remove Building 730, the Tanks, and the associated free product. The maximum length of the excavation was approximately 225 ft, the maximum width was approximately 115 ft, and the depth extended well below the bedrock surface. The project started with clearing the area prior to excavation, including removing aboveground steam line stanchions, miscellaneous concrete slabs and structures, asphalt, and groundwater wells. Wells were abandoned in accordance with State Engineer's Office procedures or totally removed. The clean

debris was disposed of as sanitary waste. During excavation, OPWL and sanitary lines were encountered and removed. OPWL lines were bagged, tapped and cut, then disposed of as LLW, or as LLMW if they contained lead or had been in contact with solvent-contaminated soil. The ends of the remaining lines (located along the excavation boundary at least 3 ft below final grade) were grouted. Sanitary lines were mostly disposed of as sanitary waste. Process waste lines close to Building 730, which contained radionuclide contamination, were managed as LLW, or as LLMW if they had been in contact with solvent-contaminated soil.

Approximately 1,700 cy of soil and debris were removed. Soil samples for waste management purposes were collected prior to removal at five locations from three intervals (16.5 to 18.5 ft bgs, 18.5 to 20.5 ft bgs, and 20.5 to 22.5 ft bgs). These samples were analyzed for radionuclides and VOCs. Results indicated all radionuclide activities were less than background with one minor exception. One activity level was slightly greater than the background mean plus two standard deviations but significantly less than the WRW soil AL (DOE et al. 2003). All VOC concentrations at 16.5 to 18.5 ft were less than the WRW soil ALs, and only one VOC concentration at 18.5 to 20.5 ft was greater than its WRW soil AL. Various VOC concentrations at 20.5 to 22.5 ft, at all five locations, exceeded their WRW soil ALs.

Based on waste characterization data, most of the removed soil was managed as hazardous waste. Soil adjacent to the upper part of Building 730, which contained radionuclide contamination, was managed as LLW. Soil that was adjacent to the bottom of the tanks and in contact with solvents was managed as LLMW. Soil around the Building 730 structure was removed to between 25 and 28 ft bgs. The excavation extended well below the bedrock surface.

The below-grade Building 730 was demolished in stages, with the tanks demolished last. Gravel that had been used as backfill around the lowermost part of the structure was also removed and disposed of as LLMW. In addition, the structure's slab under the southern tanks was broken up and removed. The portion of slab remaining in place is approximately 23 ft by 35 ft. Prior to being broken up, the entire slab was surveyed for radiological contamination. Based on the survey results, the remaining radioactivity was calculated to be 0.04 pCi/g. The total amount of plutonium remaining in the slab is estimated to be 0.0000586 g. Rubble associated with the top of the building was disposed of as sanitary waste. Rubble from the level of the tanks was disposed of as LLW. The lowermost rubble that was potentially in contact with carbon tetrachloride was managed as LLMW.

Groundwater was encountered throughout the project and was continuously pumped out into water storage tanks along with accumulated water from precipitation. Free product, primarily carbon tetrachloride, was also pumped out of the lowermost part of the excavation as encountered into the storage tanks. The water portion of the tank contents was routinely trucked to Building 891 for treatment. After water collection ceased, the remaining carbon tetrachloride free product was pumped into two intermediate bulk container (IBC) containers for disposal as radiologically contaminated free product.

Soil was removed until no free liquids were visible. After structural components, liquids, and soil were removed, four confirmation soil samples (see below) were collected to indicate residual contaminant concentrations (DOE 2005a). Carbon tetrachloride concentrations in confirmation samples collected at depths of 25 to 28 ft bgs ranged from 38 to 5,500 µg/kg, well below the WRW soil AL of 81,500 µg/kg.

The excavation was then backfilled. Backfilling began with the placement of approximately 4 ft of gravel (630 cy), followed by a layer of HRC®, three 8-inch lifts of compacted soil, a second layer of HRC®, three additional 8-inch lifts of compacted soil, and a third and final layer of HRC®. Placement of HRC® was discussed with CDPHE (the LRA) prior to placement. The remaining excavation was then backfilled. Sources of backfill included soil from the upper 16 ft of the excavation and the Trailer 371 area. Soil from the excavation was analyzed, and carbon tetrachloride concentrations were detected at less than 50 ppb. Approximately 4,200 lbs of HRC® were used. After backfilling, the site was graded. The site was reseeded after the removal of Buildings 776, 777, and 778 and the railroad spur to Building 776 (DOE 2005a).

Confirmation sampling was performed after the accelerated action removal activities to determine residual contaminant activities and concentrations. All contaminant activities and concentrations were less than WRW soil ALs (DOE et al. 2003). Of five residual locations (18499 [23.0 ft bgs], CF46-042 [25.0-25.5 ft bgs], CF46-043 [25.0-25.5 ft bgs], CF46-044 [27.0-28.0 ft bgs], and CF46-045 [25.0-25.5 ft bgs]) only 18499 and CF46-044 had detections of americium-241 (0.065 and 3.43 pCi/g respectively) and plutonium-239/240 (0.123 and 12.7 pCi/g) that were greater than background (WRW soil ALs [DOE et al. 2003] are 76.0 pCi/g for americium-241 and 50 pCi/g for plutonium-239/240). All VOCs were at least two orders of magnitude less than WRW soil ALs except for carbon tetrachloride 5,500 µg/kg (WRW 81,500 µg/kg) at CF46-042 (DOE 2005a).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 2003), an NFAA was justified for IHSS 132 based on the following:

- A significant source of groundwater contamination was removed.
- Groundwater was evaluated in accordance with the Groundwater IM/IRA (DOE 2005b). Monitoring will continue under the Sitewide IMP.
- Accelerated action data indicated that residual COC activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005a) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the NFAA status for IHSS 132 on April 19, 2005 (CDPHE 2005).

Comments

None

References

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

DOE, 1995a, Draft Data Summary 2, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1995b, Draft Data Summary 2, Operable Unit 9, Outside Tanks, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

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

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #04-04, IHSS Group 700-3, Rocky Flats Environmental Technology Site, Golden, Colorado, July

DOE, 2005a, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005b, Groundwater Interim Measure/Interim Remedial Action, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-137

IHSS Number: 137

Current Operable Unit: IA

Former Operable Unit: 8

IHSS Group: 700-6

Unit Name: Buildings 712/713 Cooling Tower Blowdown

This Final Update to the HRR for PAC 700-137 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 137 is summarized in this update. The following HRR volumes contain IHSS 137 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Late 1950s to 2000

Historical Summary

IHSS 137 is associated with two cooling towers, Building 712 and Building 713. The location of IHSS 137 is shown on Figure 21. The two cooling towers serviced Buildings 776 and 777, and were situated next to each other in an area located between Buildings 774 and 777. IHSS 137 was initially defined as a 50- by 150-ft area (DOE 1992). Because of information obtained during the development of the OU 8 Phase I RFI/RI Work Plan, IHSS 137 site boundaries were expanded to include the area adjacent to and surrounding the cooling towers, an area located approximately 10 ft beyond the foundation of Buildings 712 and 713 (DOE 1994).

Building 712 was constructed in 1962 to service Buildings 776 and 777, and Building 713 was constructed in 1966 to provide additional capacity. Buildings 702 and 703 were pump houses for Building 712 and Building 713, respectively. The cooling tower sump was located between Building 712 and Building 702. Building 713 was operated during the winter, and Building 712 was operated during the summer because it had greater cooling capacity (DOE 2001). Both cooling towers were removed prior to RFCA soil characterization and remediation (DOE 2004b, 2005).

In the past, utility workers cleaned out the sump and scraped slime off the cooling tower slats at each tower. Material removed during these activities was disposed of on the ground immediately adjacent to the cooling towers (DOE 1992).

Wind and rain damaged the cooling towers, and Building 712 was re-sided at least once. In 1991, Building 712 had open panel siding and Building 713 had open slat siding. The slat siding allowed some water to spray out of the tower onto the surrounding ground surface and form puddles (DOE 1994).

Filtered, untreated raw water from the onsite raw water reservoir was generally used in the towers. Chemicals were added to the water to prevent the biological growth and chemical

processes (corrosion and scaling) that degrade system performance by fouling heat-transfer surfaces. Prior to 1976, arsenic, chromates, and sodium silicate were added to cooling tower water to act as corrosion inhibitors (DOE 1994).

Water was removed from the cooling tower system by blowdown and drift. Drift water was released to the atmosphere and sprayed to the ground surrounding the tower. Tower water was periodically blown down to maintain a specified range of TDS. Prior to 1974, it was routine for the cooling towers to blow down effluent through underground pipes onto the soil outside the buildings where it evaporated, infiltrated into the soil, or flowed into the storm water culverts and pipes and was directed to North Walnut Creek (DOE 1994). From 1974 forward, the blowdown water from Buildings 712 and 713 was piped to the sanitary sewers and treated in the wastewater treatment plant (DOE 1994).

A leak in a cooling tower within the IHSS was reported to have occurred between August 20 and September 6, 1990. The cooling tower was reportedly releasing approximately 20 to 40 gallons per minute (gpm) of water. It is not known how long the cooling tower had been leaking prior to the response. Releases were attributed to leaks in the corroded sides of the cooling towers (DOE 1994).

IHSS Investigations

Prior to accelerated action characterization, surface soil samples were collected from seven locations within and south of the IHSS in accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1994). Samples were analyzed for radionuclides, metals, SVOCs, and VOCs. At one of the locations (sampling location SS801893, between the cooling towers), the arsenic concentration was greater than the RFCA WRW soil AL, and at another location (SS801993, east of Building 713), the arsenic and chromium concentrations were greater than the RFCA WRW soil ALs (DOE et al. 2003). The elevated arsenic concentrations were 56.2 and 201 mg/kg, respectively, and the WRW soil AL is 22.2 mg/kg. The elevated chromium concentration was 309 mg/kg, and the WRW soil AL is 268 mg/kg.

During RFCA (DOE et al. 1996) accelerated action characterization, surface and subsurface soil samples were collected from 28 sampling locations within the IHSS in accordance with IASAP Addendum #IA-03-18 (DOE 2003). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated contaminant activities and concentrations were less than RFCA WRW soil ALs with the following exceptions:

- Arsenic at sampling location CG47-024 at 0.0 to 0.5 ft was 32 mg/kg, and the AL is 22.2 mg/kg.
- Arsenic at sampling location CG47-025 at 0.0 to 0.5 ft was 97 mg/kg, and the AL is 22.2 mg/kg.
- Chromium at sampling location CG47-011 at 0.5 to 0.8 ft was 300 mg/kg, and the AL is 268 mg/kg.
- Benzo(a)pyrene at sampling location CH47-010 at 8.0 to 8.5 ft was 4,500 µg/kg, and the AL is 3,490 µg/kg.

Based on the historical and accelerated action characterization results, the RFCA hot spot methodology, and the SSRS, surface soil was removed from the two areas where surface soil concentrations were greater than three times the WRW ALs (sampling locations SS801993 and

CG47-025). Soil removal activities were proposed and conducted in accordance with ER RSOP Notification #04-17 (DOE 2004c). Accelerated action activities (characterization and soil removal) at IHSS 137 and the rationale for NFAA are discussed in detail in the Closeout Report for IHSS Group 700-6 (DOE 2004b).

Five confirmation samples were collected from each excavation (sidewalls and bottom) and analyzed for metals. All concentrations were less than WRW soil ALs, except the arsenic concentration at the eastern sidewall (sampling location CG47-052), where the concentration was 29 mg/kg. Arsenic concentrations greater than the WRW AL were not detected in soil collected at any of the confirmation or un-remediated characterization sampling locations in the vicinity of CG47-052 (DOE 2004b).

No Further Action Recommendation

NFAA was recommended for IHSS 137 based on the following:

- The two small areas of surface soil that contained arsenic concentrations more than three times the WRW AL were removed.
- Residual contaminant concentrations greater than RLs or background means plus two standard deviations remain in surface and subsurface soil located in IHSS 137. Residual contaminant concentrations greater than WRW ALs are limited to two analytes (arsenic and chromium) at four sampling locations. Based on application of the hot spot methodology and SSRS, soil at these four locations did not require remedial action. The area is not susceptible to high erosion.

After review of the Closeout Report for IHSS Group 700-6 by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 137 on September 29, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Approval, Draft Closeout Report for IHSS Group 700-6, Buildings 712/713 Cooling Tower Blowdown, IHSS 700-139.1(S) Caustic/Acid Spills Hydroxide Tank Area, September 29.

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

DOE, 1994, Phase I RCRA Facility Investigation/Remedial Investigation Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-18, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report for IHSS Group 700-6 IHSS 700-137, Buildings 712/713 Cooling Tower Blowdown, and IHSS 700-139.1(S) Caustic/Acid Spills Hydroxide Tank Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004c, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #04-17, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005, Decommissioning Closeout Report for the 776/777 Closure Project (Rev. 1), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-138

IHSS Number:	138
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-7
Unit Name:	Building 779 Cooling Tower Blowdown

This Final Update to the HRR for PAC 700-138 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 138 is summarized in this update. The following HRR volumes contain IHSS 138 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

December 8, 1976, and December 8, 1990

Historical Summary

IHSS 138 is associated with the cooling towers near Building 779. The location of IHSS 138 is shown on Figure 21. The original Building 779 cooling towers were built in 1964 east of Building 779, and were replaced in 1986 by new cooling towers (Buildings 784, 785, 786, and 787). Building 783 was the pump house associated with the replacement towers and contained much of the ancillary piping (DOE 2004b). The cooling towers were removed in the late 1990s as part of the Building 779 closure project (DOE 2000).

On December 8, 1976, a leak occurred in an underground pipeline connected to the original cooling towers. This encompassed a 50- by 50-ft area. The leak discharged approximately 400 gallons of cooling tower effluent, which was released into a storm sewer east of Building 779 and northwest of Building 727. At the time, it was stated that the spilled effluent drained toward Trench No. 6, which was part of the original surface water and shallow groundwater collection system north of the SEP (PAC 000-101). The line involved in the leak was excavated and repaired, and later removed when the original cooling towers were replaced (DOE 2004b).

On December 8, 1990, an estimated 1,000 gallons of cooling tower water overflowed from the Building 785 Cooling Tower Number 2 onto the ground. The cooling tower water released in the 1990 incident was known to contain “Nalco 2826,” an inorganic phosphate rust inhibitor (DOE 1992). There is no documentation to describe cleanup efforts for this spill (DOE 2004b).

IHSS Investigations

The cooling tower water was sampled following the 1976 incident and found to contain 50 mg/L total chromium and approximately 3,000 dpm/L alpha activity. A radiological survey was conducted along the course of the spill. No readings above background were observed. Soil samples were collected in the area; however, analytical results are not known. Samples were also

reportedly collected daily from Trench No. 6; however, analytical results are not known (DOE 2004b).

Surface soil sampling was conducted in IHSS 138 as part of the OU 8 Phase I RFI/RI. Ten samples were collected and analyzed for radionuclides, metals, VOCs, and SVOCs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2003 and DOE et al. 2003).

Characterization was conducted as part of the RFCA (DOE et al. 1996) IHSS Group 700-7 accelerated action (September 30, 2003, to August 18, 2004) in accordance with IASAP Addendum #IA-03-15 (DOE 2003). Surface and subsurface samples were collected from five sampling locations. COCs included radionuclides, metals, and VOCs. No COCs were detected at activities or concentrations greater than WRW soil ALs (DOE 2004b). Americium-241 ranged from 0.361 to 4.1 pCi/g, plutonium-239/240 from 0.187 to 23.5 pCi/g, uranium-234 from 3.197 to 4.756 pCi/g, uranium-235 from 0.122 to 0.237 pCi/g, and uranium-238 from 1.618 to 4.756 pCi/g. Acetone and zinc were at least two orders of magnitude less than their WRW soil ALs.

No Further Action Recommendation

In accordance with RFCA, an NFAA was justified for IHSS 138 based on the following:

- All contaminant activities and concentrations in surface and subsurface soil were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS indicated that the IHSS area was not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-7 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 138 on October 1, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-7 (B779) – Approval, October 1.

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

DOE, 2000, Decommissioning Closeout Report for the 779 Closure Project, Revision 0, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-15, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report for IHSS Group 700-7, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-139.1(S)

IHSS Number:	139.1(S)
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-6
Unit Name:	Caustic/Acid Spills Hydroxide Tank Area

This Final Update to the HRR for PAC 700-139.1(S) consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 139.1(S) is summarized in this update. The following HRR volumes contain IHSS 139.1(S) information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Approximately 1953 to 2000

Historical Summary

The location of IHSS 139.1(S) is shown on Figure 21. IHSS 139.1(S) consists of an area around a 5,400-gallon aboveground potassium hydroxide (KOH) tank located southeast of Building 771. The tank was surrounded by a berm that was constructed prior to 1973. The HRR (DOE 1992a) describes the tank site as an "L" shaped area 25 ft wide and 140 ft long that surrounded the KOH tank and included the hydroxide transfer line into Building 771. Because of information obtained during the development of the OU 8 Phase I RFI/RI Work Plan, site boundaries were changed to include only the 35- by 25-ft area adjacent to and surrounding the KOH tank (DOE 1994). The tank was removed prior to RFCA soil characterization and remediation (DOE 2004b, 2005).

Several releases of KOH during routine filling operations are documented for the KOH tank. The 1992 HRR states that the KOH tank overflowed before 1973, and, as a result, it was likely that the caustic seeped through the soil and infiltrated beneath the building. Interviewees for the CEARP indicated that small leaks and spills from the IHSSs 139.1(S & N) hydroxide tanks were flushed with water to dilute the caustic and carry it away from the buildings and into the storm sewers (DOE 1992a).

During the week ending May 5, 1978, a spill occurred at a caustic tank near Building 771 during a routine filling operation but was contained by the berm that surrounded the tank. This spill was believed to have involved the KOH tank (DOE 1992a).

On November 13, 1989, the KOH tank was overfilled. Approximately 5 gallons of 12-molar KOH spilled into the earthen berm that surrounded the tank. In response, approximately 100 lbs of "Oil-Dri®" was used to absorb the KOH. The contaminated soil and Oil-Dri® were removed and placed into drums. Soil samples were collected and tested for pH to verify this cleanup. The area was backfilled with new gravel. Additionally, a RCRA CPIR (89-020) was developed for this incident (DOE 1992a).

IHSS Investigations

Prior to accelerated action characterization, surface soil samples were collected from four locations within and south of the IHSS in accordance with Phase I RFI/RI Work Plans for OU 8 (DOE 1992b, 1994, 2004b). Samples were analyzed for radionuclides, metals, SVOCs, and VOCs. At one of the locations (sampling location SS804093), the benzo(a)pyrene concentration (4,300 µg/kg) was greater than the RFCA WRW soil AL (3,490 µg/kg) (DOE et al. 2003).

During RFCA (DOE et al. 1996) accelerated action characterization, surface and subsurface soil samples were collected from eight sampling locations within the IHSS in accordance with IASAP Addendum #IA-03-18 (DOE 2003). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated contaminant activities and concentrations were less than RFCA WRW soil ALs with the following exceptions:

- Benzo(a)pyrene at sampling location CF47-008 at 0.5 to 2.5 ft was 7,700 µg/kg, and the AL is 3,490 µg/kg.
- Benzo(a)pyrene at sampling location CF47-010 at 0.0 to 0.5 ft was 4,100 µg/kg, and the AL is 3,490 µg/kg.

No Further Action Recommendation

NFAA was recommended for IHSS 139.1(S) based on the following:

- Residual contaminant concentrations greater than RLs or background means plus two standard deviations remain in surface and subsurface soil located in IHSS 139.1(S). Residual contaminant concentrations greater than WRW ALs are limited to one analyte (benzo[a]pyrene) at three sampling locations (one historical and two accelerated action sampling locations).
- Based on application of the hot spot methodology and SSRS, soil containing benzo(a)pyrene at three locations did not require remedial action.
- Based on the SSRS and stewardship evaluation, no additional accelerated actions are required. The area is not susceptible to high erosion.

After review of the Closeout Report for IHSS Group 700-6 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 139.1(S) on September 29, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Approval, Draft Closeout Report for IHSS Group 700-6, Buildings 712/713 Cooling Tower Blowdown, IHSS 700-139.1(S) Caustic/Acid Spills Hydroxide Tank Area, September 29.

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

DOE, 1992b, Phase I RCRA Facility Investigation/Remedial Investigation Work Plan for Operable Unit 8, 700 Area, Rocky Flats Plant, Golden, Colorado, December.

DOE, 1994, Phase I RCRA Facility Investigation/Remedial Investigation Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-18, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report for IHSS Group 700-6 IHSS 700-137, Buildings 712/713 Cooling Tower Blowdown, and IHSS 700-139.1(S) Caustic/Acid Spills Hydroxide Tank Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005, Decommissioning Closeout Report for the Building 771 Closure Project Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, July 9.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-139.1(N)(a)

IHSS Number:	139.1N(a)
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-11
Unit Name:	Hydroxide Tank, KOH, NaOH Condensate

This Final Update to the HRR for PAC 700-139.1(N)(a) consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 139.1(N)(a) is summarized in this update. The following HRR volumes contain IHSS 139.1(N)(a) information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1953 to 2001

Historical Summary

IHSS 139.1(N)(a) consisted of the area adjacent to two steel, 8,000-gallon aboveground storage tanks (T-107 and T-108) that received steam condensate from an evaporative waste concentration system formerly used in Building 774. The location of IHSS 139.1(N)(a) is shown on Figure 21. The tanks were located approximately 100 yards north of Building 774 and situated on a concrete slab. The tank bottoms were corroded (DOE 1992a). The tanks received condensate after testing indicated the absence of radioactive contamination. After approximately 1980, condensate was no longer conveyed to the tanks. Since then, the western tank received overflow and precipitation runoff from the bermed area surrounding the NaOH tank located north of Building 774. The two condensate receiving tanks were removed in October 2001. A storm drain line originating north of the concrete slab conveyed runoff from the slab to the north and then east, where it emptied into North Walnut Creek at surface water monitoring station SW093.

IHSS Investigations

Five sediment samples were collected in 1993 and analyzed for metals and VOCs in accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1992b). All contaminant concentrations were less than RFCA Tier I and WRW soil ALs (DOE 2004, DOE et al. 1996 and 2003). Surface and subsurface soil samples were also collected from two sampling locations in 1999 and analyzed for radionuclides, metals, VOCs, SVOCs, and PCBs in accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1994). All contaminant activities and concentrations were less than RFCA Tier I and WRW soil ALs (DOE 1999, DOE et al. 2003).

During RFCA (DOE et al. 1996) accelerated action characterization of IHSS Group 700-11, surface and subsurface soil samples were collected from two sampling locations within the IHSS in accordance with IASAP Addendum #IA-04-10 (DOE 2004). COCs included radionuclides,

metals, VOCs, SVOCs, and PCBs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2005). Maximum concentrations or activities greater than background for locations CH49-033 and CG49-063 (maximum depth is 2 ft bgs) were arsenic at 11.1 mg/kg, barium at 774.0 mg/kg, chromium at 82.0 mg/kg, iron at 47,500.0 mg/kg, nickel at 66.2 mg/kg, strontium at 188.0 mg/kg, vanadium at 174.0 mg/kg, zinc at 130.0 mg/kg, uranium-234 at 5.132 pCi/g, uranium-235 at 0.228 pCi/g, uranium-238 at 5.132 pCi/g, and trichloroethene 76.1 μg/kg.

No Further Action Recommendation

NFAA was recommended for IHSS 139.1(N)(a) based on the following:

- All contaminant activities and concentrations in surface and subsurface soil were less than RFCA WRW soil ALs.
- Results of the SSRS and stewardship evaluation indicated that additional action was not necessary. The area is not susceptible to high erosion.

After review of the Closeout Report for IHSS Group 700-11 (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 139.1(N)(a) on February 4, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Approval, Closeout Report for IHSS Group 700-11, February 4.

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

DOE, 1992b, Phase I RFI/RI Work Plan, 700 Area, Operable Unit 8, Rocky Flats Plant, Golden, Colorado, December.

DOE, 1994, Phase I RFI/RI Work Plan, 700 Area, Operable Unit 8, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Industrial Area Sampling and Analysis Plan FY04 Addendum #IA-04-10, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2005, Closeout Report for IHSS Group 700-11, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-139.1(N)(b)

IHSS Number:	139.1(N)(b)
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-4
Unit Name:	Hydroxide Tank, KOH, NaOH Condensate

This Final Update to the HRR for PAC 700-139.1(N)(b) consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 139.1(N)(b) is summarized in this update. The following HRR volumes contain IHSS 139.1(N)(b) information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1953 to 2001

Historical Summary

IHSS 139.1(N)(b) consisted of the area around a 6,500-gallon aboveground NaOH tank that was located north of Building 774. The location of IHSS 139.1(N)(b) is shown on Figure 21. The tank was surrounded by a berm that had been constructed prior to 1973. Interviews for the CEARP indicated small leaks and spills at the caustic receiving areas north and south of Building 774 and that numerous releases of NaOH are documented for the 6,500-gallon aboveground NaOH tank. Small leaks and spills from the hydroxide tank were flushed with water to dilute the caustic and carry it away from the buildings and into the storm sewers (DOE 1992).

In April 1985, a pinhole leak was discovered in the piping from the tank. Although the leak was inside Building 774, the caustic was found to have seeped along the pipe outside the building. In late April or early May of the same year, a small leak was discovered at a thermocouple fitting on this tank. The released caustic had solidified on the tank, never reaching the secondary containment. Caustic observed in the pit was suggested to be the result of a poor sampling technique that allowed the valve to drip. In October 1986, it was estimated that 80 to 100 gallons of NaOH were released over the history of the tank because of this problem (DOE 1992).

On June 22, 1987, during a routine delivery transfer from a tanker truck to the Building 774 NaOH supply tank, approximately 100 gallons of the liquid caustic soda overflowed. The caustic spilled inside the bermed area of the tank and drained to the caustic catch tank (western condensate receiving tank PAC 700-139.1[N][a]). Approximately 1 to 2 gallons of caustic leaked out of the bermed area onto the roadway in front of Building 774. The NaOH on the roadway was diluted and rinsed off immediately following the occurrence. A work order was initiated to repair and seal the cracks in the berm on the same day of the occurrence. In approximately 1988, the NaOH tank north of Building 774 was overfilled again. No documentation was found that further detailed this event (DOE 1992).

The NaOH tank was removed during the Building 771/774 closure project (DOE 2005).

IHSS Investigations

One surface soil sample was collected in the area of the NaOH tank, in accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1994). Analytical results indicated that the only contaminant measured above RLs was zinc, and the zinc concentration was less than the RFCA Tier II soil AL (DOE et al. 1996).

During RFCA (DOE et al. 1996) accelerated action characterization of IHSS Group 700-4, surface and subsurface soil samples were collected from one sampling location within IHSS 139.1(N)(b) in accordance with IASAP Addendum #IA-03-01 (DOE 2003). COCs included radionuclides, metals and nitrate. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2004b, DOE et al. 2003). Maximum values for results greater than background at location CG48-015 (2 intervals 0.0-0.5 ft and 0.5-2.5 ft bgs) included: aluminum at 25,000 mg/kg, arsenic at 15.3 mg/kg, barium at 699.0 mg/kg, beryllium at 1.0 mg/kg, chromium at 39.6 mg/kg, copper at 189.0 mg/kg, iron at 32,500.0 mg/kg, lithium at 14.0 mg/kg, nickel at 44.9 mg/kg, strontium at 162.0 mg/kg, vanadium at 168.0 mg/kg, zinc at 181.0 mg/kg, uranium-234 at 4.700 pCi/g, and uranium-238 at 4.819 pCi/g.

No Further Action Recommendation

NFAA was recommended for IHSS 139.1(N)(b) based on the following:

- All contaminant activities and concentrations in surface and subsurface soil were less than RFCA WRW soil ALs.
- Results of the SSRS and stewardship evaluation indicated that additional action was not necessary because erosion of soil at this location was not likely to affect surface water.

After review of the ER Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the NFAA status for IHSS 139.1(N)(b) on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Approval, ER RSOP Notification and Closeout Report for IHSS Group 700-4 (B771 & 774), February 6.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005, 771 Closure Project Closeout Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-139.2

IHSS Number:	139.2
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-4
Unit Name:	Caustic/Acid Spills Hydrofluoric Acid

This Final Update to the HRR for PAC 700-139.2 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 139.2 is summarized in this update. The following HRR volumes contain IHSS 139.2 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Prior to May 1971 to 2001

Historical Summary

IHSS 139.2 is located in the area of two 1,200-gallon hydrofluoric acid supply tanks, which were located to the southeast of Building 771 in a small shed known as Building 714. The location of IHSS 139.2 is shown on Figure 21. Hydrofluoric acid (HF) had reportedly infiltrated the soil in the vicinity of the storage area. Numerous small spills and leaks were reported to have occurred during routine filling and transfer operations. Later, the HF was delivered in portable tanks that were replaced when empty and required no open transfer. These "portable tanks" were sealed cylinders with a weight of approximately 1,300 lbs fully loaded (DOE 1992).

In May 1971, a leak in an HF connection outside Building 771 was reported. A small amount of vapor was released but no personnel exposures occurred. No further details of this incident were provided (DOE 1992).

The HF tanks and shed were removed during the 771 closure project prior to RFCA soil characterization and remediation (DOE 2004b, 2005).

IHSS Investigations

One surface soil sample was collected in the area of the HF tanks, in accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1994). Analytical results indicated all contaminant activities and concentrations were less than RFCA Tier I soil ALs (DOE et al. 1996).

Surface soil samples were collected from two sampling locations within the IHSS in accordance with RFCA (DOE et al. 1996) IASAP Addendum #IA-03-01 (DOE 2003). COCs included radionuclides, metals, and SVOCs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2004b, DOE et al. 2003). Maximum values for results greater than background at locations CF47-006 and CF47-007 (one interval in each, 0.0-0.5 ft bgs) included: arsenic at 17.3 mg/kg, barium at 805.0 mg/kg, chromium at 45.4 mg/kg, copper at 118.0 mg/kg, iron at 35,900 mg/kg, manganese at 591.0 mg/kg, nickel at

63.9 mg/kg, strontium at 240.0 mg/kg, vanadium at 92.4 mg/kg, zinc at 175.0 mg/kg, uranium-234 at 4.927 pCi/g, uranium-235 at 0.302 pCi/g, and uranium-238 at 4.927 pCi/g. SVOCs were not detected above WRW soil ALs.

No Further Action Recommendation

NFAA was recommended for IHSS 139.2 based on the following:

- All contaminant activities and concentrations in surface and subsurface soil were less than RFCA WRW soil ALs.
- Results of the SSRS and stewardship evaluation indicated that additional action was not necessary because impacts to surface water were unlikely.

After review of the ER Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 139.2 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Approval, ER RSOP Notification and Closeout Report for IHSS Group 700-4 (B771 & 774), February 6.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005, 771 Closure Project Closeout Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-143

IHSS Number:	143
Current Operable Unit:	IA
Former Operable Unit:	6
IHSS Group:	000-3
Unit Name:	Old Outfall – Building 771

This Final Update to the HRR for PAC 700-143 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 143 is summarized in this update. The following HRR volumes contain IHSS 143 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 (DOE 1997); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1953 to May 1971

Historical Summary

IHSS 143 is located northwest of Building 771 as shown on Figure 21. During the building's early history starting in 1953, some waste liquids were discharged to a storm drain located north and west of the building. The storm drain discharged into North Walnut Creek. The main discharge source was an outfall from the Building 771 laundry holding tanks. Other sources included the analytical laboratory and radiography sinks, the personnel decontamination room, and runoff from the roof of Building 771 and the ground areas (DOE 1992a).

Liquid wastes in the laundry holding tanks were discharged to this storm drain if the plutonium concentration was less than 3,300 dpm/L. Between mid-1953 and mid-1957, 4.5 million gallons of liquid were released containing a total of 2.23 millicuries (mCi). As early as 1953, contamination at the outfall was measured at 17,400 dpm/g in the soil. Soil contamination at the discharge was reported in May 1956, with the highest sample containing 130 dpm/g gross alpha activity.

In 1957, a waste line was completed that allowed the option of releasing these liquids to the Building 774 outfall below Building 995 (Pond B-1 [PAC NE-142.5]). Because of equipment problems, periodic releases from the laundry holding tanks to the 771 outfall continued until 1965. From 1957 until 1965, 430,000 gallons were released containing a total of 0.25 mCi. No documentation exists regarding the liquid quantity or quality from other sources. In April 1958, instrument readings of up to 8,000 cpm were obtained on the rocks in the area. In May 1958, soil contamination was reported to be as high as 2,000 dpm/g gross alpha activity(DOE 1992a).

In April 1970, soil samples collected contained more than 190,000 dpm/g plutonium. Results for subsequent soil samples collected had radioactivity as high as 229,290 dpm/g plutonium. In September 1970, approximately 75 ft^3 of contaminated soil was removed from the area. Another document states that two 55-gallon drums of contaminated soil were removed during this time.

In January 1971, a report stated that instrument surveys conducted in the ditch area indicated the prior removal of two barrels of soil and vegetation was insufficient. The removal resumed in February 1971 and was completed by August 31, 1971. A total of 149 drums of contaminated soil were removed from an area approximately 800 ft^2. In one small area the contamination was as deep as 3.5 ft. A final survey of the area showed no direct alpha count greater than 250 cpm. Final soil sampling results averaged 34 dpm/g with a maximum of 150 dpm/g (DOE 1992a).

In May 1971, a sewer line break resulted in storage tanks overflowing through the 771 outfall (DOE 1992a).

During the week ending August 4, 1978, a hot spot approximately 875 ft^2 was found near a culvert northwest of the Building 771 parking lot during construction of the PSZ (DOE 1992a). Cleanup of the soil occurred during summer 1980. Nine boxes of contaminated soil were removed.

The area that was formally the outfall culvert was filled in with soil and paved for a Building 771 parking lot in approximately 1980 (DOE 1992a).

IHSS Investigations

Environmental data were collected at IHSS 143 in accordance with the Phase I RFI/RI Work Plan for the Walnut Creek Priority Drainage (OU 6) (DOE 1992b), and reported in the Phase I RFI/RI Report (DOE 1996). Four surface soil samples, seven subsurface soil samples, and one groundwater sample were analyzed for radionuclides, metals, VOCs (except surface soil), SVOCs, pesticides, PCBs, and water quality parameters.

Surface soil contained above-background concentrations of several metals, plutonium-239/240, and several SVOCs. The metal concentrations and plutonium activities were of the same order of magnitude as the background levels and well below the RFCA WRW soil ALs (DOE et al. 2003). SVOC concentrations were all below the WRW soil ALs, generally by a large margin.

From the NFAA Justification for IHSS 143 (Table 2) (DOE 2004b) selected maximum surface soil concentrations or activity include: chromium at 17.7 mg/kg, cobalt at 12.9 mg/kg, manganese at 374 mg/kg, nickel at 21.3 mg/kg, strontium at 53.8 mg/kg, zinc at 85.4 mg/kg, plutonium-239/240 at 0.52 pCi/g, benzo(a)anthracene at 1,800 μg/kg, benzo(a)pyrene at 2,300 μg/kg, benzo(b)fluoranthene at 3,200 μg/kg, benzo(k)fluoranthene at 1,200 μg/kg, indeno(1,2,3-cd)pyrene at 890 μg/kg, and nitrate at 1.41 mg/kg.

Subsurface soil contained above-background concentrations of radionuclides, barium, strontium, Aroclor-1254, and VOCs (DOE 1996). The metals were detected above background infrequently, and their concentrations were well below the WRW soil ALs. Aroclor-1254 was detected only once and at a concentration an order of magnitude lower than the WRW soil AL. The radionuclides were detected more frequently above background than the metals, but at activities two orders of magnitude less than the WRW soil ALs. Methylene chloride and toluene were the VOCs detected in subsurface soil. Methylene chloride was detected in only one of the 26 samples and at a very low concentration (5 μg/kg). Toluene was detected in all the subsurface soil samples; however, concentrations were several orders of magnitude lower than the WRW soil AL.

From the NFAA Justification for IHSS 143 (Tables 3a and 3b) (DOE 2004b) selected maximum native subsurface soil or fill results include: barium at 1,150 mg/kg, strontium at 279 mg/kg,

Aroclor-1254 at 940 µg/kg, americium-241 at 0.09 pCi/g, plutonium-239/240 at 0.28 pCi/g, uranium-238 at 1.6 pCi/g, methylene chloride at 5 µg/kg, and toluene at 1,200 µg/kg.

In alluvial well 77492, which is directly downgradient of IHSS 143, only a few metals, one pesticide (alpha-BHC), one SVOC (bis[2-ethylhexyl]phthalate), and one VOC (carbon tetrachloride) were detected above RFCA Tier II groundwater ALs (DOE 1996).

The Building 771 outfall, along with other Building 771 storm drains that may have connected to the outfall, were removed or plugged as part of PAC 000-505 (DOE 2005).

No Further Action Recommendation

NFAA was recommended for IHSS 143 based on the following:

- All contaminant activities and concentrations in surface and subsurface soil were less than RFCA WRW soil ALs.
- Previous remediation activities at this IHSS effectively addressed the release of contamination.
- Results of the SSRS and stewardship evaluation indicated that additional action was not necessary. The IHSS area is not susceptible to high erosion.

After review of the NFAA Justification (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 143 on September 29, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: No Further Accelerated Action (NFAA) Request for IHSS 143 (B771), September 29.

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

DOE, 1992b, Final Phase I RFI/RI Work Plan, Walnut Creek Priority Drainage (Operable Unit No. 6), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1996, Final Phase I RFI/RI Report, Walnut Creek Priority Drainage, Operable Unit 6, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, No Further Accelerated Action (NFAA) Request for IHSS 143, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Data Summary Report for IHSS 000-3, PAC 000-505, Storm Drains, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBERS: 700-144(N) and 700-144(S)

IHSS Numbers:	144(N) and 144(S)
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-3
Unit Name:	Sewer Line Overflow

This Final Update to the HRR for PACs 700-144(N) and 700-144(S) consolidates the information in the initial HRR with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 144(N) and 144(S) is summarized in this update. The following HRR volume contains IHSS 144(N) and 144(S) information:

Original Report – 1992 (DOE 1992a).

Date(s) of Operation or Occurrence

June 7, 1972

Historical Summary

IHSS 144 was originally defined as a 10- by 10-ft area between Buildings 777 and 779 (DOE 1992a). Based on information obtained during development of the OU 8 Phase I RFI/RI Work Plan (DOE 1992b), IHSS 144 was divided into two separate sites: IHSS 144(N) and IHSS 144(S). IHSS 144(N) is approximately 25 ft by 70 ft and located adjacent to and east of Building 730. IHSS 144(S) is approximately 15 ft by 170 ft and located between Buildings 777 and 779. Both IHSSs are associated with the release of radioactive laundry wastewater during transfer of wastewater from the laundry waste holding tanks, which were located beneath the Building 730 pump house, to the sanitary sewer system. The locations of IHSSs 144(N) and 144(S) are shown on Figure 21.

The Building 730 pump house was located north of Building 776 and east of Building 701. The Building 776 laundry wastewater was stored in two concrete underground tanks, designated as Tanks 776A and 776C. Tank 776A had a 22,500-gallon capacity, and Tank 776C had a 4,500-gallon capacity. The tanks had three discharge pipes (two OPWL lines and one sanitary sewer line) that exited Building 730 on the northern side. The tanks were collocated with two concrete process waste holding tanks, designated as Tanks 776B and 776D. Tanks 776A and 776C are also known as Tank 9, and Tanks 776B and 776D are also known as Tank 10. These four tanks constitute PAC 700-118.1 and are associated with PAC 700-132.

Tanks 776A and 776C were taken out of service in October 1984, at which time both chambers were cleaned, painted, and converted to plenum deluge catch tanks. Tanks 776B and 776D were abandoned in December 1982; however, these tanks reportedly were not cleaned when abandoned.

On June 7 or 8, 1972, the increased pumping rate, resulting from a recent Building 776 radiography vault floor drain remodel, during a transfer of laundry wastewater from the tanks to Building 995 caused suspension of high-level radioactive sediment in the tanks and

pressurization of the sewer line. The pressurization of the line caused a toilet and sink in Building 701 to overflow, and the sanitary sewer line east of the tanks to rupture. The toilet, sink, and floor of Building 701, as well as the ground east of the building, were contaminated. The line section that ruptured was apparently located between Buildings 777 and 779. The pressurization of the transfer line also caused sanitary waste to back up and overflow at a cleanout plug near Building 701 (DOE 1992a). Approximately 50 drums of contaminated soil were removed from east of the holding tanks, and 19 drums of contaminated soil were removed from around Building 701. According to an employee logbook, no radioactivity was detected at that time.

IHSS Investigations

The radiological survey performed in the late 1970s and early 1980s did not indicate areas above 500,000 pCi/g near the IHSS.

Soil gas and surface soil samples were collected from IHSS 144(N) and analyzed during the OU 8 Phase I RFI/RI in accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1992b, 1995, 2005). Carbon tetrachloride was present at a concentration of 3.2 μg/L at one soil gas location. Benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)-pyrene were also detected. Concentrations of antimony, calcium, chromium, copper, lead, magnesium, silver, zinc, americium-241, and plutonium-239/240 exceeded background values. Surface soil samples collected from IHSS 144(S) indicated plutonium-239/240 activities exceeded background values.

Surface and subsurface samples were collected from eight sampling locations within IHSS 144(N) as part of the RFCA (DOE et al. 1996) IHSS Group 700-3 accelerated action soil characterization (DOE 2005). Sampling and analysis were conducted in accordance with IASAP Addendum #IA-03-04 (DOE 2003). Samples were analyzed for radionuclides, metals, VOCs, and SVOCs. All contaminant activities and concentrations were less than WRW soil ALs (DOE et al. 2003).

All of the OU 8 and IHSS Group 700-3 sampling locations became no longer representative (NLR) because of the excavation associated with remediation of IHSSs 118.1 and 132. Soil from these locations was completely removed (DOE 2005).

Based on the characterization results obtained during the OU 8 Phase I RFI/RI (DOE 1995), no additional characterization of IHSS 144(S) was included in IASAP Addendum #IA-03-04 (DOE 2003). Results from the OU 8 data set include: silver at 0.56 mg/kg, zinc at 179 mg/kg, americium-241 at 0.026 pCi/g, plutonium-239/240 at 0.98 and 0.130 pCi/g, and uranium-235 at 0.120 pCi/g.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 2003), an NFAA was justified for IHSSs 144(N) and 144(S) based on the following:

- All contaminant activities and concentrations in surface and subsurface soil were less than WRW soil ALs.
- Results of the SSRS indicate that the IHSS area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSSs 144(N) and 144(S) on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 1992b, Phase I RFI/RI Work Plan, 700 Area, Operable Unit 8, Rocky Flats Plant, Golden, Colorado, December.

DOE, 1995, Draft Data Summary, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, IHSS Group 700-3 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBERS: 700-146.1 – 700-146.6

IHSS Numbers:	146.1 – 146.6
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-4
Unit Name:	Concrete Process Waste Tanks

This Final Update to the HRR for PACs 700-146.1 through 700-146.6 consolidates the information in the initial HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 146.1 through 146.6 is summarized in this update. The following HRR volumes contain IHSS 146.1 through 146.6 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Prior to 1956 to 1972

Historical Summary

The location of IHSSs 146.1 through 146.6 is shown on Figure 21. Six underground process waste holding tanks were located south of Building 774. Building 774, a liquid waste processing facility, had been modified several times since its construction in 1952. During the construction of a southern addition in 1972, the tanks were removed. The six tanks were immediately west of Tanks 66, 67, and 68, (PACs 700-124.1, 124.2, and 124.3). The process waste stored in the tanks was an aqueous solution containing plutonium, uranium, acids, and caustics. These tanks overflowed frequently (DOE 1992).

IHSS 146 consisted of a six-chambered reinforced concrete structure south of Building 774. The chambers of the structure were referred to as Tank 30 (IHSS 146.5), Tank 31 (IHSS 146.1), Tank 32 (IHSS 146.2), Tank 33 (IHSS 146.6), Tank 34W (IHSS 146.3), and Tank 34E (IHSS 146.4). These tanks were also referred to as Tanks 13 and 15. Tanks 30 and 33 had 3,750-gallon capacities, and the others had 7,500-gallon capacities. The tanks were 11 ft, 8 inches high, and had walls that were approximately 10 inches thick. The area occupied by the tanks was 22.5 ft (east-west) by 32.5 ft (north-south). The elevation of the bottoms of the tanks was approximately 5,955 ft. The floors of the tanks were at the same approximate height as the second floor of Building 774. The ground surface south of Building 774 slopes steeply to the north and levels out near the top of the tanks.

In October 1956, the process waste tanks overflowed and in August 1957, some of the tanks leaked again. Radioactivity was measured at levels up to 2,500 dpm/g. The 1957 release was cleaned up. One of the releases reportedly flowed down the East Road toward North Walnut Creek. Minor leaks from the six tanks was suspected of causing contamination found in footing drain water north of Building 774. Water from the Building 774 footing drains contained activities as high as 500 dpm/L (DOE 1992).

Excavation for the Building 774 addition construction began in February 1972 when contamination resulting from the overflow of the tanks was detected. Contaminated soil was removed and by April 1972, 101 barrels of contaminated soil were reportedly shipped to Idaho Falls (DOE 1992).

Demolition of the concrete tanks began on May 8, 1972. Approximately 200 cy of contaminated soil were removed in 1972 at the time the tanks were decommissioned, as well as during construction of the southern addition to Building 774. The soil was initially piled north of Building 334 (PAC 300-156.1), and subsequently moved to the eastern end of the Triangle Area by June 1973 (PAC 900-165). Another 60 cy of soil, removed from around the tanks, was buried under 3 ft of fill dirt east of Building 881 (PAC 800-130). This soil averaged approximately 250 dpm/g (DOE 1992).

IHSS Investigations

RFCA (DOE et al. 1996) accelerated action characterization samples were collected and analyzed in accordance with RFCA (DOE et al. 1996) IASAP Addendum #IA-03-01 for IHSS Group 700-4 (DOE 2002). Two locations targeting IHSSs 146.1 through 146.6 were sampled (CG48-011 and CG48-012, surface soil) and analyzed for radionuclides, metals, SVOCs, nitrate, PCBs, and VOCs. Of the radionuclides, only uranium-234 (3.4 pCi/g), uranium-235 (0.100 pCi/g), and uranium-238 (3.4 pCi/g) were detected at activities greater than background but less than RFCA WRW soil ALs. Arsenic (20.2 mg/kg), barium (764.0 and 675.0 mg/kg), chromium (50.1 and 40.5 mg/kg), copper (103.0 and 81.6 mg/kg), iron (42,300 and 24,100 mg/kg), manganese (387.0 mg/kg), nickel (61.4 and 38.3 mg/kg), strontium (170.0 and 161.0 mg/kg), vanadium (136.0 and 120.0 mg/kg), and zinc (90.5 and 103.0 mg/kg) were detected at concentrations greater than background but less than WRW soil ALs. Benzo(a)anthracene (110.0 and 230.0 μg/kg), benzo(a)pyrene (150.0 and 320.0 μg/kg), chrysene (200.0 and 450.0 μg/kg), indeno(1,2,3-cd)pyrene (51.0 μg/kg) were detected along with benzyl alcohol (360.0 μg/kg) and xylene (17.0 μg/kg), all at levels less than WRW soil ALs. Analytical results from the characterization are presented in the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b).

Because IHSSs 146.1 through 146.6 are part of IHSS Group 700-4 and are associated with Buildings 771/774, the following should be noted:

- As a result of the routine predischarge sampling for Pond A-4 (PAC NE-142.4), conducted on November 3, 2004, elevated americium-241 activities were noted in Pond A-4. These elevated activities were detected in samples collected by both DOE and CDPHE. These activities exceeded the RFCA surface water ALs for americium-241 and, as a result, the pond water was not discharged.
- In early December 2004, DOE collected a number of surface water samples in the North Walnut Creek drainage to investigate the source of elevated americium-241 noted in Ponds A-3 (PAC NE-142.3) and A-4. The sampling was concentrated in the area where Buildings 771/774 formerly stood. One sample, collected from a pool of water in OPWL (PAC 000-121) Manway 3, northwest of Building 771, contained elevated americium-241 activities without significant plutonium-239/240 activity, which is the same americium-241/plutonium-239/240 signature observed in Ponds A-3 and A-4. This manway received

outfall from former Building 771 and consisted of a series of sanitary sewer lines, footing drains, and other lines that dumped into storm drain Grate 771-4 at Sixth Street.

- Based on this sampling result, actions to stop any additional water from this source from entering North Walnut Creek were taken. The manway, which had been covered with soil as a result of site grading activities at former Building 771, was excavated and flows from the incoming pipes were intercepted, analyzed, and treated as needed. All pipes to and from the manway were removed, as well as the manway itself. The storm drain from Building 771 was grouted.
- Subsequently, the water in Pond A-4 was treated using a co-precipitation and filtration process and met stream standards for discharge.

No Further Action Recommendation

Based on analytical results and the SSRS, further action was not required and an NFAA determination was justified for IHSS 146.1 through 146.6.

After review of the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (includes IHSSs 146.1 to 146.6) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the NFAA status for IHSSs 146.1, 146.2, 146.3, 146.4, 146.5, and 146.6 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4 (B771 & 774) - Approval, February 6.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-147.1

IHSS Number:	147.1
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	000-2
Unit Name:	Process Waste Line Leaks

This Final Update to the HRR for PAC 700-147.1 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 147.1 is summarized in this update. The following HRR volume contains IHSS 147.1 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1955 to 1984

Historical Summary

Three OPWLs are located within IHSS 147.1: P-11, P-12, and P-13. P-11 is a 3-inch ribbed hose inside a 10-inch vitrified clay line, P-12 is a 3-inch stainless steel line inside a 10-inch vitrified clay line, and P-13 is a 3-inch ribbed hose inside a 4-inch fiberglass line. All three lines were grouted as part of the IHSS Group 000-2 accelerated action and left in place (DOE 2005). The location of IHSS 147.1 is shown on Figure 21.

On September 27, 1955, a leak in the process waste line north of the 800 Area was reported. Approximately 1 ft of process wastewater was present in a manhole. In June 1959, monitoring indicated low-level contamination along the process waste line from Building 881 to Building 774. During summer 1984, the process waste line connecting Building 881 to Building 374 cracked. The break occurred approximately 150 yards south of the guard gate into the Building 777 complex. Approximately 2 yards of contaminated soil were removed during the cleanup process.

A May 1971 report stated that the transfer line from Building 444 and Building 881 to Building 774 had broken and leaked several times during the past 20 years (DOE 1992). The leaks generally occurred east of Eighth Street and north of Central Avenue. Typical constituents of waste discharged into the process waste system included uranium, plutonium, beryllium, acids, and solvents. The report states that nitrate migration in the soil from the leaking transfer line was traced by samples collected from shallow wells.

IHSS Investigations

IHSS 147.1 was characterized during RFCA (DOE et al. 1996) accelerated actions within IHSS Group 000-2 in accordance with IASAP Addendum #IA-03-11 (DOE 2003). Soil characterization had not been conducted prior to the accelerated action. Groundwater samples collected from monitoring wells located at various points east of where breaks had occurred indicated up to several hundred ppm nitrate (DOE 1992).

One subsurface soil sample was collected from 9.0 to 10.5 ft bgs and analyzed for radionuclides, metals, and VOCs. The sampling location (CE40-000) targeted the junction of lines P-11, P-12, and P-13 where leaks potentially occurred. All contaminant activities and concentrations were less than the WRW soil ALs (DOE 2005, DOE et al. 2003). Results greater than background or RLs include: cadmium at 160.0 mg/kg, uranium (total) at 7.6 mg/kg, acetone at 14 µg/kg, methylene chloride at 1.5 µg/kg, uranium-234 at 4.4 pCi/g, uranium-235 at 0.81 pCi/g, and uranium-238 at 8.5 pCi/g.

No Further Action Recommendation

NFAA was recommended for IHSS 147.1 based on the following:

- All contaminant activities and concentrations were less than RFCA WRW soil ALs.
- Results of the SSRS and the stewardship evaluation indicated that additional action was not necessary.

After review of the Closeout Report for IHSS Group 000-2 (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 147.1 on October 6, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Rampe, DOE RFFO from D. Kruchek, CDPHE, RE: Closeout Report for IHSS Group 000-2, Original Process waste Lines (OPWL) –NFAA Approval, October 6.

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

DOE, 2003, Final Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-149.1

IHSS Number:	149.1
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	000-2
Unit Name:	Effluent Line

This Final Update to the HRR for PAC 700-149.1 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 149.1 is summarized in this update. The following HRR volume contains IHSS 149.1 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1972 to 1980

Historical Summary

IHSS 149.1 was defined along two OPWL (PAC 000-121) lines (referred to as P-26) which were installed in 1972 to transfer wastes from Building 774 to SEP 207-A (PAC 000-101). The location of IHSS 149.1 is shown on Figure 21. One of the lines was a 1.5-inch polyethylene line, and the other was a PVC line of unknown diameter (DOE 2005). These lines were abandoned in place in 1980 after the vapor compression evaporator in Building 374 was constructed. While in use during June or July 1973, a contractor broke a PVC line, and the line was repaired (DOE 1992).

In the late 1970s, another release may have occurred along one of the lines. A process waste line break southeast of Building 774 resulted in a release of liquid that flowed around to the front of the building. Another more detailed document reports that on July 21, 1980, an 8-year-old process waste line was discovered leaking southeast of Building 774. Wastewater was observed seeping up in the soil on the southern side of the road southeast of Building 774. The wastewater flowed downslope and through a 30-foot culvert, along the east chain-link fence and under the fence at the corner. From this point, the liquid flowed under the unpaved access road into a boggy area, the 771/774 Footing Drain Pond (Bowman's Pond), north of Building 774 (PAC 700-1108). It was estimated that approximately 1,000 gallons had leaked from the process waste line (DOE 1992).

The initial response to the July 1980 incident was to stop the flow through the waste line causing the leak to stop. When the soil dried, a FIDLER survey was conducted and verified that the flow did not go beyond the 771/774 Footing Drain Pond (Bowman's Pond). On July 24, the broken waste line was excavated and the problem identified as a loose flange. Soil excavation began July 28, 1980, with radiation monitors checking the soil as it was excavated (DOE 1992).

IHSS Investigations

Prior to accelerated actions, very limited characterization was conducted within IHSS 149.1. Two subsurface samples are known to have been collected along the length of P-26, and all contaminant activities and concentrations were less than RFCA WRW soil ALs, with one exception. The arsenic concentration in one of the samples was 24.6 mg/kg, and the WRW soil AL is 22.2 mg/kg (DOE 2002a, DOE et al. 2003).

IHSS 149.1 was characterized as part of accelerated actions in accordance with IASAP Addenda #IA-02-07 (SEP AOC) (DOE 2002a), #IA-03-01 (IHSS Group 700-4) (DOE 2003a), and #IA-03-11 (IHSS Group 000-2/OPWL) (DOE 2003b). Fourteen subsurface soil samples were collected along the length of P-26. Three of the samples were collected within IHSS Group 700-4 and analyzed for radionuclides, metals, and nitrates (DOE 2004). Five of the samples were collected within IHSS Group 000-2 and analyzed for radionuclides, metals, and VOCs (DOE 2005). Six of the samples were collected within IHSS Group 000-1 (SEP AOC) and analyzed for radionuclides, metals, and nitrates (DOE 2003c). All contaminant activities and concentrations were less than RFCA WRW soil ALs, with two exceptions noted below.

The samples were collected at characterization locations, which remain as residual locations along IHSS 149.1. The locations are CH48-000, CH48-003, CH48-016, CH48-020, CH48-021, CH48-051, CI48-000, CI48-001, CI48-002, CI48-039, CI48-040, CJ48-000, CJ48-001, and CJ48-041 (DOE 2005). Locations CJ48-000 and CJ48-001 each had arsenic concentrations (36.3 and 31.1 mg/kg, WRW soil AL is 22.2 mg/kg) greater than WRW soil AL (DOE 2005) that were left in place because they were less than RFCA Tier I soil ALs (DOE 2005).

Both lines were suspected of leaking along their entire length. P-26 was removed as part of RFCA (DOE et al. 1996) accelerated actions in accordance with ER RSOP Notification #02-08 (IHSS Group 000-1, Solar Ponds [DOE 2002b]) and ER RSOP Notification #03-14 (IHSS Group 000-2, OPWL [DOE 2003d]). Accelerated action results are presented in the Closeout Reports for IHSS Group 000-1 (DOE 2003c) and the Closeout Report for IHSS Group 000-2 (DOE 2005).

No Further Action Recommendation

NFAA was recommended for IHSS 149.1 based on the following:

- All contaminant activities and concentrations were less than RFCA WRW ALs, with one exception noted above.
- P-26 was removed as part of IHSS Group 000-2 accelerated actions.
- Results of the SSRS and the stewardship evaluation indicated that additional action was not necessary.

After review of the Closeout Report for IHSS Group 000-1 (DOE 2003c) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 149.1 on July 29, 2003 (CDPHE 2003). In addition, after review of the Closeout Report for IHSS Group 000-2 (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 149.1 on October 6, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 000-1, July 29.

CDPHE, 2005, Correspondence to J. Rampe, DOE RFFO from D. Kruchek, CDPHE, RE: Closeout Report for IHSS Group 000-2, Original Process waste Lines (OPWL) –NFAA Approval, October 6.

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

DOE, 2002a, Industrial Area Sampling and Analysis Plan FY02 Addendum #IA-02-07, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation IHSS Group 000-1 Solar Evaporation Pond Area of Concern, August.

DOE, 2003a, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003b, Final Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003c, Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003d, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation IHSS Group 000-2 OPWL, October.

DOE, 2004, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005, Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-149.2

IHSS Number:	149.2
Current Operable Unit:	IA
Former Operable Unit:	9
IHSS Group:	000-2
Unit Name:	Effluent Line

This Final Update to the HRR for PAC 700-149.2 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 149.2 is summarized in this update. The following HRR volumes contain IHSS 149.2 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1972 to 1980

Historical Summary

IHSS 149.2 consists of the area around three OPWL (PAC 000-121) lines (P-36, P-37, and P-38) running east-west, north, and northeast of former Building 779 connecting the IA to the SEP (PAC 000-101) area. The location of IHSS 149.2 is shown on Figure 21. P-36 is a 3-inch PVC and stainless steel line. P-37 is a 3-inch steel, PVC, and vitrified clay line. P-38 is a 6-inch and 10-inch vitrified clay line (DOE 2005). Leaks were suspected along the length of all three lines, including pipe joints and Valve Pit No. 1, which was located southeast of Pond 207-C (DOE 2005).

IHSS Investigations

IHSS 149.2 was characterized as part of RFCA (DOE et al. 1996) accelerated actions in accordance with IASAP Addenda #IA-02-07 (SEP AOC) (DOE 2002), #IA-03-11 (IHSS Group 000-2/OPWL) (DOE 2003b), and #IA-03-15 (IHSS Group 700-7) (DOE 2003c). Twenty-one subsurface soil samples were collected along the length of the three lines. Twelve of the samples were collected as part of IHSS Group 700-7 and analyzed for radionuclides, metals, and VOCs (DOE 2004). Two of the samples were collected as part of IHSS Group 000-2 and analyzed for radionuclides, metals, and VOCs (DOE 2005). Seven of the samples were collected as part of IHSS Group 000-1 (SEP AOC) and analyzed for radionuclides, metals, and nitrates (DOE 2003d). Contaminant activities and concentrations were less than RFCA WRW soil ALs, with the following six exceptions:

- The arsenic concentration at sampling location CI46-001, collected from 3.5 to 4.5 ft bgs within IHSS Group 700-7, was 25 mg/kg, and the WRW AL is 22.2 mg/kg.
- The americium-241 activity at sampling location CJ46-057, collected from 9.0 to 9.5 ft bgs within IHSS Group 700-7, was 4,230 pCi/g, and the WRW AL is 76 pCi/g.

- The plutonium-239/240 activity at sampling location CJ46-057, collected from 9.0 to 9.5 ft bgs within IHSS Group 700-7, was 24,111 pCi/g, and the WRW AL is 50 pCi/g.
- The arsenic concentration at sampling location CJ46-DR01, collected from 7.5 to 7.51 ft bgs within IHSS Group 000-1, was 30.9 mg/kg, and the WRW AL is 22.2 mg/kg.
- The plutonium-239/240 activity at sampling location CJ46-000, collected from 11.0 to 11.1 ft bgs within IHSS Group 000-1, was 148.2 pCi/g, and the WRW AL is 50 pCi/g.
- The plutonium-239/240 activity at sampling location CJ46-002, collected from 11.0 to 11.1 ft bgs within IHSS Group 000-1, was 182.4 pCi/g, and the WRW AL is 50 pCi/g.

The sample from location CJ46-057, with high americium-241 and plutonium-239/240 activities, was obtained from soil where liquid spilled from the end of an OPWL that was being removed. Those activities were not representative of residual soil conditions prior to OPWL excavation (refer to data for sampling location CJ46-005 [DOE 2004]). The area where the spill occurred was remediated as verified by five confirmation samples (sampling locations CJ46-051 through CJ46-055[DOE 2004]). Approximately 12 cy of radiologically contaminated soil was removed down to approximately 3.5 ft bgs.

The lines within the IHSS were not removed; however, Valve Pit No. 1 was removed (DOE 2003d, 2005). Pipe ends were grouted.

No other remediation within the IHSS was conducted based on RFCA (DOE et al. 2003), the SSRS, and the depth of the contaminant activities and concentrations. Plutonium-239/240 activities greater than the WRW AL were less than 1 nCi/g and located more than 3 ft below final grade.

No Further Action Recommendation

NFAA was recommended for IHSS 149.2 based on the following:

- Residual contaminant activities and concentrations were less than RFCA WRW ALs, with the six exceptions noted above.
- Results of the SSRS indicated that additional action was not necessary. The IHSS is not in an area susceptible to high erosion.
- Results of the stewardship evaluation indicated that additional action was not necessary.

After review of the Closeout Report for IHSS Group 000-1 (DOE 2003d) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 149.2 on July 29, 2003 (CDPHE 2003). Also, after review of the Closeout Report for IHSS Group 700-7 (DOE 2004) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 149.2 on October 1, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 000-1, July 29.

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-7, October 1.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan FY02 Addendum #IA-02-07 Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Final 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, August.

DOE, 2003c, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-15 IHSS Group 700-7, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003d, Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2004, Closeout Report for IHSS Group 700-7, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005, Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-150.1

IHSS Number:	150.1
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-4
Unit Name:	Radioactive Site North of Building 771

This Final Update to the HRR for PAC 700-150.1 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 150.1 is summarized in this update. The following HRR volumes contain IHSS 150.1 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

September 1957 to 1974

Historical Summary

As shown on Figure 21, IHSS 150.1 is located along the northern side of Building 771 and extends east to Building 770. This area is paved and served as the main access road to Buildings 771 and 774. Building 771's main function was plutonium recovery and Building 770 was used for radioactive waste storage for part of its history.

Several incidents occurred north of Building 771 that impacted the IHSS 150.1 area. Brief descriptions of these follow (DOE 1992):

- On September 11 and 12, 1957, a fire in Building 771 caused the high efficiency particulate air (HEPA) filters in the plenum to be breached. An unknown amount of radioactivity was released, primarily north and southwest of the building.
- In October 1964, a barrel leak resulted in contamination of the ground near the carpenter shack and Building 770. The east dock of Building 771 was also contaminated.
- In September 1966, a leaking barrel containing washables was found to be the source of contamination west of Building 770 and on the east dock and ramp of Building 771. The contamination was spread when the leaking barrel was moved from west of Building 770 to the east dock of Building 771. Contamination was measured up to 100,000 cpm at the Building 771 east dock and ramp and up to 60,000 cpm west of Building 770. In response, the area west of Building 770 was roped off, the east dock of Building 771 was partially decontaminated, and the ramp was marked.
- In October 1967, contamination was spread from Building 770 to the East Dock of Building 771 during the transport of a leaking barrel containing contaminated washables. Contamination levels were as high as 100,000 cpm. In response, the contaminated ground in front of Building 770 was covered with plastic, and all other contamination was removed.

- From approximately 1962 until approximately 1968, a 5,000-gallon stainless steel tank was located approximately 30 ft north of Building 771. The tank was used in the Filtrate Recovery Ion Exchange system that concentrated plutonium and americium for recovery. The resulting liquid contained in the tank was a nitrate solution high in americium-241 with some plutonium-239/240. The tank was on 6-ft legs and was approximately 8 ft in diameter. Two overhead pipes from Room 114 in Building 771 connected to the tank. In 1968, a pinhole leak developed in the tank, and liquid dripped onto the slab foundation. The tank was temporarily sealed to mitigate the leak until the tank could be emptied. Once emptied, the tank was taken out of service, size-reduced, and disposed of as radioactive waste. The concrete slab was decontaminated and the concrete was painted to secure the fixed radioactivity. The slab was moved to a ditch directly north of the area and buried (PAC 700-163.2). The area was paved sometime prior to June 1969.
- On June 11, 1968, during the removal of drums from the 903 Pad (PAC 900-112), a drum leaked on the roadway as it was being transported from the 903 Pad to Building 774. The drum was a solvent or rinse drum. The forklift that carried the drum to Building 774 traveled across the northern side of Building 771. The leak resulted in contamination of levels up to 50,000 cpm over 500 ft^2 of ground surface north of the Building 771 west dock. Four barrels of soil were removed. This incident and other incidents impacting the Plant roadways are discussed as PAC 000-172.
- A drum leak incident in July 1968 contaminated the concrete slab outside Building 771. Most of the slab was decontaminated. One small area with contamination to 1,500 cpm was covered with plastic.
- Drums that had previously been stored east of the SEP in the Triangle Area (PAC 900-165) and barrels of waste from the 1969 fire were stacked in the paved area north of Building 771. In October 1969, soil contaminated by a leaking barrel at Building 770 was removed.
- On November 16, 1970, contamination leaked from a hole in the bottom of a barrel of ful-flo filters as it was being transported from the storage area east of the SEP (PAC 000-101) to Building 771 for processing. The ground surface near the dock at Building 771, the truck, and the cargo container in which the drum was stored were contaminated. The drum was placed on the ground in the northeastern corner of the parking area. The workers monitored themselves after returning to the building and found their booties contaminated. In response, the area was decontaminated, and the floor of the cargo container was replaced. In addition, the contaminated soil was removed.
- On March 9, 1971, a monthly status report noted a significant increase in the number of "hot waste" drums stored in the open, north of Building 771.
- On June 8, 1971, a waste barrel leaked in the storage yard north of Building 771. The rigid liner and plastic bag within the drum had been punctured allowing liquid to corrode the barrel. Between 115 and 200 ft^2 of asphalt were contaminated. A monthly status report for June 1971 stated that approximately 1,000 drums were being stored on the asphalt slab north of Building 771, unprotected from the environment. In response, soil and approximately 200 ft^2 of asphalt were removed for off-site disposal.
- On July 2, 1971, a leaking waste drum was discovered outside Building 771. The employee that discovered the spill tracked contamination around the area while retrieving a monitor.

A subsequent rainstorm spread the contamination. The waste drum leak incident resulted in contamination of asphalt and gravel surfaces in an area between 2,300 and 2,500 ft^2 in size. Contamination levels ranged from 500 to 1,000,000 cpm. Other documentation reports that contamination ranged from 100,000 to 300,000 dpm/100 cm^2 on the asphalt. In response, strippable paint was applied to the spill area and the area where the employee tracked contamination. Approximately 2,300 ft^2 of asphalt and an undetermined amount of soil were removed for off-site disposal.

- In August 1972, a punctured scrap box stored inside Building 770 contaminated 3,600 ft^2 inside the building and 500 ft^2 outside. Levels of radioactivity ranged up to 200,000 dpm/cm^2. Removal of asphalt and soil for off-site disposal began immediately following the incident.
- On September 15, 1972, a 55-gallon drum containing spent ion-exchange residue leaked inside Building 770 onto the concrete floor. Contamination was tracked between Building 771 and Building 770. The incident resulted in contamination levels ranging from 5,000 to 100,000 cpm over 600 ft^2. Decontamination activities occurred; however, it is unclear as to the nature of these activities.

Use of this area for material storage ceased in approximately 1974 when storage operations were moved to Building 776. Efforts were made, sitewide, in the early 1970s to move all radioactively contaminated materials to indoor storage (DOE 1992).

IHSS Investigations

In accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1994), eight surface soil samples were collected within IHSS 150.1 and analyzed for radionuclides, metals, and SVOCs. The maximum detected activities of plutonium-239/240 and americium-241 were 0.028 and 0.015 pCi/g, respectively. Benzo(a)pyrene and benzo(b)fluoranthene were detected at 2,600 and 7,800 μg/kg, which exceed the RFCA Tier II soil ALs (DOE et al. 1996). All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2003, DOE et al. 2003).

During accelerated action characterization of IHSS Group 700-4, surface and subsurface soil samples were collected from 26 locations within IHSS 150.1 in accordance with IASAP Addendum #IA-03-01 (DOE 2003). Samples were analyzed for radionuclides and metals. The maximum activities of americium-241 and plutonium-239/240 did not exceed background levels. Uranium-234, uranium-235, and uranium-238 were detected at maximum activities of 6.175, 0.338, and 6.175 pCi/g, respectively. All radionuclide activities were less than the RFCA WRW soil ALs (DOE et al. 2003). All metal concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with the following two exceptions:

- Arsenic was detected at 22.8 mg/kg in surface soil at sampling location CF49-000, and the WRW soil AL is 22.2 mg/kg.
- Arsenic was detected at 30 mg/kg in surface soil at sampling location CF49-005, and the WRW soil AL is 22.2 mg/kg.

Arsenic was detected in IHSS Group 700-4 at a concentration greater than the RFCA WRW AL at two surface soil locations. An action was required when the 95 percent UCL of the mean of the COC across the AOC divided by the AL is greater than one. The 95 percent UCL of the mean

for arsenic was 14.3 across the AOC, and the WRW soil AL is 22.2 mg/kg. The resulting ratio is 0.642, and, therefore, action for arsenic was not indicated (DOE 2004b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), NFAA was recommended for IHSS 150.1 based on the following:

- Contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with the two arsenic exceptions noted above.
- The ratio of the 95 percent UCL for arsenic to the RFCA WRW soil AL (DOE et al. 2003) for arsenic was less than one.
- Results of the SSRS presented in the Closeout Report for IHSS Group 700-4 did not indicate that further action is required (DOE 2004b).

After review of the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 150.1 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4, February 6.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-150.2(N)

IHSS Number:	150.2(N)
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-4
Unit Name:	Radioactive Site West of Buildings 771/776

This Final Update to the HRR for PAC 700-150.2(N) consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 150.2(N) is summarized in this update. The following HRR volumes contain IHSS 150.2(N) information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

September 11, 1957

Historical Summary

IHSS 150.2 was originally defined as a 70-ft by 250-ft area west of Building 771. Subsequent information obtained for the Final OU 8 Phase I RFI/RI Work Plan indicated that IHSS 150.2 should be divided into two separate areas (DOE 1994). The northern portion is located adjacent to the western side of Building 771 and is addressed in this writeup. The southern portion is located adjacent to the western side of Building 776 and is addressed in the PAC 700-150.2(S) writeup.

The location of IHSS 150.2(N) is shown on Figure 21. IHSS 150.2(N) is associated with radiological contamination that resulted from the September 11, 1957 fire in Building 771. The fire was discovered in Room 108 of Building 771, and fires in the box exhaust booster filters and main filter plenum were discovered soon after. An explosion in the main exhaust duct probably contributed to the release of plutonium from the stack. During firefighting and decontamination activities at Building 771, access to the main filter plenum was gained through a hatchway on the western side of the building. This activity was the main cause of the spread of contamination on the western side of Building 771. In general, the fire released radioactive contamination primarily north and southwest of the building (DOE 1992).

The results of a radiological survey during the late 1970s and early 1980s did not indicate that the areas around the western side of Buildings 771 and 776 were highly contaminated (DOE 1992). No other historical data were found for the IHSS (DOE 2004a).

IHSS Investigations

In accordance with IASAP Addendum #IA-03-01 (DOE 2003), surface samples were collected from 25 sampling locations within IHSS 150.2(N) as part of IHSS Group 700-4 accelerated action soil characterization (DOE 2004b). Samples were analyzed for radionuclides, metals, VOCs, and SVOCs. All radionuclide activities were less than RFCA WRW soil ALs (DOE et al.

2003). Americium-241 and plutonium-239/240 were not detected above background levels. The maximum detected activities of uranium-234, uranium-235, and uranium-238 were 6.076, 0.311, and 6.076 pCi/g, respectively. Concentrations of metals, VOCs, and SVOCs were less than RFCA WRW soil ALs (DOE et al. 2003), with the following exceptions:

- Benzo(a)pyrene was detected at 23,000 µg/kg at sampling location CE47-012 and the WRW soil AL is 3,490 µg/kg.
- Dibenz(a,h)anthracene was detected at 5,500 µg/kg at sampling location CE47-012 and the WRW soil AL is 3,490 µg/kg.
- Benzo(a)pyrene was detected at 16,000 µg/kg at sampling location CE48-012 and the WRW soil AL is 3,490 µg/kg.

Because the benzo(a)pyrene and dibenz(a,h) anthracene occurrences were isolated exceedances, the 95 percent UCLs were calculated for these contaminants over the AOC. An action is required when the 95 percent UCL of the mean of the COC across the AOC divided by the AL is greater than one. The 95 percent UCL of the mean for benzo(a)pyrene was 2,997.8 across the AOC, and the AL is 3,490 µg/kg. The resulting ratio was 0.859; thus, action for benzo(a)pyrene was not indicated. The 95 percent UCL of the mean for dibenz(a,h)anthracene was 1,610.9 across the AOC, and the WRW soil AL is 3,490 µg/kg. The resulting ratio was 0.462; thus, action for dibenz(a,h)anthracene was not indicated.

In accordance with the consultative process, DOE removed the soil from sampling locations CE47-012 and CF48-012 as part of IHSS Group 000-2 (OPWL) activities. Four confirmation samples were collected at each location. Results of confirmation sampling at these locations indicated that all PAHs were less than RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), NFAA was recommended for IHSS 150.2(N) because residual concentrations of contaminants in soil following the accelerated action were less than RFCA WRW soil ALs (DOE et al. 2003).

After review of the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 150.2(N) on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4, February 6.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-150.2(S)

IHSS Number:	150.2(S)
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-3
Unit Name:	Radioactive Site West of Buildings 771/776

This Final Update to the HRR for PAC 700-150.2(S) consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 150.2(S) is summarized in this update. The following HRR volume contains IHSS 150.2(S) information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

May 11, 1969

Historical Summary

IHSS 150.2 was originally defined as a 70-ft by 250-ft area west of Building 771. Subsequent information obtained for the Final OU 8 Phase I RFI/RI Work Plan indicated that IHSS 150.2 should be divided into two separate areas (DOE 1994). The northern portion is located adjacent to the western side of Building 771 and is addressed in the IHSS 150.2(N) writeup. The southern portion is located adjacent to the western side of Building 776 and extends south to the northwestern corner of Building 778. This portion is addressed in this writeup. The location of IHSS 150.2(S) is shown on Figure 21.

IHSS 150.2(S) is associated with radiological contamination that resulted from the May 11, 1969 fire in Buildings 776 and 777. Plutonium was tracked outside Building 776 by firefighting and support personnel and was detectable on the ground around the building. The tracking of contamination was confined to an area 20 by 100 ft west of the building. Another source states that the contaminated area extended from the southern wall of Building 778 to the northern wall of the maintenance addition to Building 776 in a strip approximately 30 ft wide along the western wall of Building 776. Following the fire, rain carried contamination into the soil. Airborne contamination was carried predominately to the west-southwest, the average wind direction at the time. Contamination was detected outside the building up to 200 ft away (DOE 1992).

Oil and gravel were placed on areas of contaminated soil to stabilize the contamination. The soil, oil, and gravel were removed on July 19, 1969. At least a portion of the sidewalk on the western side of Building 776 was also removed. A new asphalt road was constructed on top of the affected area by the end of July 1969. In May 1971, contaminated steps, the dock, and ramp areas on the western side of Building 776 were covered with an epoxy paint. Areas of contamination outside Building 776 were covered with asphalt. In June 1980, contaminated asphalt was removed from the western side of Building 776 and boxed as radioactive waste (DOE 1992).

The radioactivity of soil removed during 1969 was measured at 7 dpm/g. In May 1971, a study of the steps, dock, and ramp areas on the western side of Building 776 indicated radioactive contamination as high as 6,000 cpm. In January 1972, the soil at the southwestern corner of Building 776 was considered contaminated. The cause of the contamination was not stated. In 1973, a survey was conducted on the asphalt road west of Building 776 to determine contamination levels prior to widening the road. The maximum soil activity found was 70 dpm/g plutonium. The results of the radiological survey, performed at Rocky Flats during the late 1970s and early 1980s, indicated no extremely contaminated areas (500,000 to 1,000,000 pCi/g) around the western sides of Buildings 771 and 776.

IHSS Investigations

Surface and subsurface samples were collected from 34 sampling locations within IHSS 150.2(S) in accordance with IASAP Addendum #IA-03-04 as part of IHSS Group 700-3 accelerated action soil characterization (DOE 2003). Samples were analyzed for radionuclides, VOCs, and PCBs. Plutonium-239/240 was detected at maximum activities of 0.556 and 0.778 pCi/g in surface and subsurface soil, respectively. Americium-241 was detected at a maximum activity of 0.144 pCi/g in surface soil and was not detected in subsurface soil at activities exceeding background. Aroclor-1254 was detected at maximum concentrations of 25 and 370 μg/kg in surface and subsurface soil, respectively; and Aroclor-1260 was detected at maximum concentrations of 26 and 210 μg/kg in surface and subsurface soil, respectively. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2005, DOE et al. 2003).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for IHSS 150.2(S) based on the following:

- Residual COC activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) indicated that additional action was not necessary because the soil is not in an area susceptible to erosion and does not contain enough contaminants and a sufficient pathway to cause an exceedance of surface water standards.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 150.2(S) on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 1994, Phase I RFI/RI Work Plan, 700 Area, Operable Unit 8, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, IASAP Addendum #IA-03-04, IHSS Group 700-3 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-150.3

IHSS Number:	150.3
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-4
Unit Name:	Radioactive Site Between Buildings 771 and 774

This Final Update to the HRR for PAC 700-150.3 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 150.3 is summarized in this update. The following HRR volumes contain IHSS 150.3 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

August, September, and December 1971, and late 1970s or early 1980s

Historical Summary

During excavation for construction between Buildings 771 and 774 in August 1971, a cement tunnel containing process waste lines was exposed. At one time, the tunnel had also been used as an exhaust ventilation duct for Building 774. Three cracks in the concrete walls were found to be contaminated. The incident resulted in the release of plutonium contamination to the soil. After the incident, the contaminated cracks were sealed, and eight drums of soil were removed. The location of IHSS 150.3 is shown on Figure 21.

In September 1971, construction excavation resulted in further exposure of the tunnel. This incident resulted in 24 dpm/g of contamination in the soil. After the incident, the contaminated cracks were sealed, and contaminated soil was removed.

In December 1971 (or possibly early January 1972), construction activities in this area resulted in a broken process waste line. Samples of the process waste indicated an activity of approximately 1,000 pCi/L. Soil samples from the area were found to be only slightly contaminated. It is not clear whether liquid released was process, laundry, or sanitary wastewater.

Personnel recall an incident in this area in the late 1970s or early 1980s. A flange in a line separated releasing an unspecified amount of aqueous process waste that reached the ground surface. The liquid waste contained low levels of radionuclides as well as nitrate and other contaminants.

IHSS Investigations

In accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1994), seven surface soil samples were collected within IHSS 150.3 and analyzed for radionuclides, metals, and SVOCs. Plutonium-239/240 was detected at a maximum activity of 1.9 pCi/g. Americium-241 was not detected in excess of background levels. All contaminant activities and concentrations were less

than RFCA WRW soil ALs, with two exceptions (DOE 2002, DOE et al. 2003). Benzo(a)pyrene was detected at 3,900 μg/kg at one sampling location and at 9,800 μg/kg at another location. The WRW soil AL is 3,490 μg/kg. However, these locations became NLR during the IHSS Group 700-4 accelerated action (DOE 2004b).

Subsurface samples were collected from four sampling locations within IHSS 150.3 in accordance with IASAP Addendum #IA-03-01 (DOE 2003). Results are presented in the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b). Samples were analyzed for radionuclides, metals, and VOCs. Neither plutonium-239/240 nor americium-241 were detected at activities exceeding background levels. Uranium-234, uranium-235, and uranium-238 activities slightly exceeded background levels, with maximum detections of 4.788, 0.247, and 4.788 pCi/g, respectively. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), NFAA was recommended for IHSS 150.3 based on the following:

- Contaminant activities and concentrations were less than RFCA WRW soil ALs.
- Results of the SSRS indicated that erosion of soil at this IHSS was not likely to expose residual contaminants and affect surface water, therefore additional action was not necessary.

After review of the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 150.3 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4, February 6.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-150.4

IHSS Number:	150.4
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-3
Unit Name:	Radioactive Site Northwest of Building 750

This Final Update to the HRR for PAC 700-150.4 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 150.4 is summarized in this update. The following HRR volume contains IHSS 150.4 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1969 to 1981

Historical Summary

IHSS 150.4 consists of a 20- by 20-ft area around the sump located south of Building 778 outside Door 3, where a leaking process waste line was discovered in 1981. The location of IHSS 150.4 is shown on Figure 21. Decontamination fluid storage tanks were stored in this general area (southeast of Building 778) following the May 1969 fire in Building 776. The leaking line was repaired. No documentation regarding soil removal or other cleanup activities was found.

Specific isotopic analyses performed at the time of discovery indicated 900 pCi/L uranium but no plutonium (DOE 1992). Whether the analyses were performed on soil or water was not specified.

IHSS Investigations

One surface soil sample was collected in accordance with the Phase I RFI/RI Work Plan for OU 8, 700 Area (DOE 1994), and results indicated activities of uranium-234, uranium-235, and uranium-238 at 3.3, 0.15, and 3.5 pCi/g, respectively. Plutonium-239/240 and americium-241 were not detected at activities exceeding background values (DOE 1995, 2005). All radionuclide activities were less than RFCA WRW soil ALs (DOE et al. 2003).

One surface and four subsurface samples were collected from one sampling location in accordance with IASAP Addendum #IA-03-04 as part of IHSS Group 700-3 accelerated action soil characterization (DOE 2003). Samples were analyzed for radionuclides, metals, and VOCs. Americium-241 and plutonium-239/240 were not detected above background levels. Uranium-234, uranium-235, and uranium-238 were detected at maximum activities of 4.519, 0.26, and 4.519 pCi/g, respectively. Ethylbenzene, toluene, and xylenes were detected at concentrations of 36.3, 40.4, and 207 μg/kg in subsurface soil. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2005, DOE et al. 2003).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for IHSS 150.4 based on the following:

- Residual COC activities and concentrations in IHSS 150.4 were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) indicated that additional action was not necessary because the soil is not in an area susceptible to erosion and does not contain enough contaminants and a sufficient pathway to cause an exceedance of surface water standards.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 150.4 on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Draft Data Summary, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, IASAP Addendum #IA-03-04, IHSS Group 700-3 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-150.5

IHSS Number:	150.5
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	Not Applicable
Unit Name:	Radioactive Site West of Building 707 (IAG Name: Radioactive Leak West of Building 707)

This Final Update to the HRR for PAC 700-150.5 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 150.5 is summarized in this update. The following HRR volumes contain IHSS 150.5 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Date(s) of Operation or Occurrence

1953 to 1983

Historical Summary

PAC 700-150.5 was originally defined in the IAG as a radioactive leak west of Building 707 and was later determined to be the same as PAC 700-123.2. The location of IHSS 150.5 is shown on Figure 21.

IHSS Investigations

No investigation was deemed necessary for IHSS 150.5 because the site was investigated as IHSS 123.2. See PAC Reference Number 700-123.2 for a discussion of investigations at this site.

No Further Action Recommendation

IHSS 150.5 was proposed in the 1998 Annual Update to the HRR (DOE 1998) for NFA because IHSS 123.2 is the actual contamination site. IHSS 150.5 was approved as an NFA because the environmental investigations were planned and implemented as IHSS 123.2. IHSS 150.5 was approved by CDPHE (the LRA) and EPA as NFA in 1999 (CDPHE and EPA 1999) and was removed from maps. See PAC Reference Number 700-123.2 for information regarding the dispositioning of this site.

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA, RE: Annual Update for the Historical Release Report (September 1998), July 9.

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

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

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBERS: 700-150.6 and 700-150.8

IHSS Numbers:	150.6 and 150.8
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-7
Unit Name:	Radioactive Site South of Building 779 (150.6) and Radioactive Site Northeast of Building 779 (150.8)

This Final Update to the HRR for PACs 700-150.6 and 700-150.8 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 150.6 and 150.8 is summarized in this update. The following HRR volumes contain information on IHSSs 150.6 and 150.8:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

June 1969

Historical Summary

In June 1969, radioactive contamination occurred due to an improperly opened waste drum in Building 779, and was spread by pedestrians tracking the contamination to areas east (IHSS 150.8) and south (IHSS 150.6) of the building. The locations of IHSSs 150.6 and 150.8 are shown on Figure 21. One portion of IHSS 150.8 overlaps with PAC 700-1105, a transformer site. The waste drum was being cut apart near the Building 779 eastern dock, which was located along the northern half of the eastern side of the building. The drum contained residual oil with radionuclides. Although the exact pathway along which workers walked was unknown, it was known that the building's south entrance was also contaminated. It is unclear whether workers got from the dock to the south entrance by walking inside the building, or by walking outside and around the building. The surface outside the building was mostly paved, and was heavily used by pedestrian traffic.

At the time of the incident, contaminated soil was placed in barrels and removed for off-site disposal. It is not known whether all areas affected by this incident were included in cleanup activities. It is also not known whether the removal of soil was in response to the incident described above or a separate incident. Contamination was measured at up to 50,000 dpm/100 cm^2 of gross alpha activity (DOE 1992).

IHSS Investigations

These IHSSs were investigated in accordance with the Phase I RFI/RI Work Plan for OU 8, 700 Area (DOE 1994), which required visual observations, radiological surveys, and surface soil sampling (DOE 1995). Ten surface soil samples were collected beneath paved areas and in unpaved areas, and analyzed for radionuclides, metals, and SVOCs. At one surface soil sampling

location near the overlap area between IHSS 150.8 and PAC 700-1105, Aroclor-1260 was detected at 21,000 µg/kg. This detection was considered to be part of PAC 700-1105, a transformer site that underwent soil remediation for PCBs; see PAC 700-1105 for details of this action. All other contaminant activities and concentrations for OU 8 samples in IHSSs 150.6 and 150.8 were less than RFCA WRW soil ALs (DOE et al. 2003). The maximum detected plutonium-239/240 activity was 2.6 pCi/g and the maximum detected americium-241 activity was 0.4 pCi/g (DOE 1995).

Based on this historical data, no additional characterization of IHSSs 150.6 and 150.8 was conducted as part of the IHSS Group 700-7 accelerated action (DOE 2003b, 2004).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for IHSSs 150.6 and 150.8 based on the following:

- Residual COC activities and concentrations in IHSSs 150.6 and 150.8 were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for 700-7 (DOE 2004) indicated that additional action was not necessary because the soil is not in an area susceptible to erosion and does not contain enough contaminants and a sufficient pathway to cause an exceedance of surface water standards.

After review of the 2003 Annual HRR Update (DOE 2003a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSSs 150.6 and 150.8 on October 20, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO from S.H. Gunderson CDPHE, RE: No Further Accelerated Action (NFAA) for IHSS Groups 150.6 and 150.8 (B779), October 20.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Draft Data Summary, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Industrial Area Sampling and Analysis Plan Addendum #IA-03-15, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004, Closeout Report for IHSS Group 700-7, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-150.7

IHSS Number:	150.7
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-3
Unit Name:	Radioactive Site South of Building 776

This Final Update to the HRR for PAC 700-150.7 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 150.7 is summarized in this update. The following HRR volume contains IHSS 150.7 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

May 1969

Historical Summary

As shown on Figure 21, IHSS 150.7 consists of an area between Buildings 776/777 and 778, and an area between Buildings 778 and 707. Plutonium was tracked in these areas when firefighting and support personnel responded to the May 11, 1969 fire in Buildings 776 and 777. The spread of contamination south of Buildings 776 and 777 can also be attributed to the runoff of firewater sprayed on the building to contain the fire. Following the May 1969 fire, rain carried contamination into the soil.

Road oil and gravel were initially placed over the contaminated soil. An asphalt roadway was completed in the area on July 22, 1969. By December 1969, asphalt in the area, contaminated soil, and presumably the road oil and gravel had been removed from between the buildings.

In 1972, the soil at the southwestern corner of Buildings 776 and 777 was considered contaminated. The levels and source of this contamination were unknown, and it was not known whether the contamination was related to the 1969 fire.

IHSS Investigations

One surface soil sample was collected within IHSS 150.7, in accordance with the Phase I RFI/RI Work Plan for OU 8, 700 Area (DOE 1994), and the sample was analyzed for radionuclides. Americium-241 was detected above background at an activity of 0.026 pCi/g; however, all activities were less than the RFCA WRW soil AL (DOE 1995, DOE et al. 2003).

Surface and subsurface soil samples were collected from 20 sampling locations within IHSS 150.7 in accordance with IASAP Addendum #IA-03-04 as part of IHSS Group 700-3 accelerated action characterization sampling (DOE 2003). Most of the samples were analyzed for only radionuclides, however some were also analyzed for metals and VOCs. Americium-241 and plutonium-239/240 were detected at maximum activities of 0.993 and 5.662 pCi/g, respectively. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2005, DOE et al. 2003).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for IHSS 150.7 based on the following:

- Residual COC activities and concentrations in IHSS 150.7 were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) indicated that additional action was not necessary because the soil was not in an area susceptible to erosion and does not contain enough contaminants and a sufficient pathway to cause an exceedance of surface water standards.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 150.7 on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Draft Data Summary, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, IASAP Addendum #IA-03-04, IHSS Group 700-3 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-163.1

IHSS Number:	163.1
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-4
Unit Name:	Radioactive Site 700 North of Building 774 (Area 3) Wash Area

This Final Update to the HRR for PAC 700-163.1 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS, which was conducted in accordance with the RFCA accelerated action process. The disposition of IHSS 163.1 is summarized in this update. The following HRR volumes contain IHSS 163.1 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Unknown

Historical Summary

CEARP Phase 1 interviewees indicated the area north of Building 774 was used to wash radioactively contaminated equipment. The location of IHSS 163.1 is shown on Figure 21 where the washwater flowed onto the ground. Building 774 personnel did not recall this area ever being used to wash equipment. The eastern half of the area is mostly flat and paved and was repaved in 1987 or 1988 (DOE 1992).

Washwater from radioactively contaminated equipment would be expected to have low levels of radionuclides and may also have contained various organic and inorganic compounds. A sitewide radiological survey was performed from 1977 through 1984. No radioactivity above background levels was indicated at this location by the radiological survey (DOE 1992).

IHSS Investigations

In accordance with the Phase I RFI/RI Work Plan for OU 8 (DOE 1994), nine surface soil samples were collected within IHSS 163.1 and analyzed for radionuclides, metals, and SVOCs. Americium-241 and plutonium-239/240 were detected at maximum activities of 0.017 and 0.55 pCi/g, respectively. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 1995, DOE et al. 2003).

During accelerated action characterization of IHSS Group 700-4, surface and subsurface soil samples were collected from 16 sampling locations within IHSS 163.1 in accordance with IASAP Addendum #IA-03-01 (DOE 2003). Samples were analyzed for radionuclides, metals, SVOCs, and PCBs. The maximum detected activities of plutonium-239/240 and americium-241 were 1.061 and 13.671 pCi/g, respectively. All contaminant activities and concentrations were less than WRW soil ALs (DOE 2004b, DOE et al. 2003).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), NFAA was recommended for IHSS 163.1 based on the following:

- All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 700-4 (DOE 2004b) indicated that additional action was not necessary because erosion of soil at this location was not likely to affect surface water.

After review of the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 163.1 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4, February 6.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Draft Data Summary, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-163.2

IHSS Number:	163.2
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	700-4
Unit Name:	Radioactive Site 700 Area 3 Americium Slab

This Final Update to the HRR for PAC 700-163.2 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 163.2 is summarized in this update. The following HRR volume contains IHSS 163.2 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

Prior to 1973

Historical Summary

Burial of an americium-contaminated concrete slab was documented as north of Building 771. This slab was originally believed to be buried in the area near Building T771A by the Perimeter Road. According to this same source, the slab was later excavated and the contaminated portion cut away for off-site disposal. The location of IHSS 163.2 is shown on Figure 21.

The slab was approximately 8 ft square and 10 inches thick. From approximately 1962 until approximately 1968, the slab served as a foundation for a 5,000-gallon stainless steel tank located approximately 30 ft north of Building 771 (PAC 700-150.1). The tank was on 6-ft legs and was approximately 8 ft in diameter. Two overhead pipes from Room 114 in Building 771 connected to the tank. The tank was used in the Filtrate Recovery Ion Exchange system, which concentrated plutonium and americium for recovery. The resulting liquid contained in the tank was a nitrate solution high in americium with some plutonium (DOE 1992).

In approximately 1968, a pinhole leak developed in the tank and dripped onto the slab. The tank was temporarily sealed to mitigate the leak until the tank could be emptied through the processing of the contained solution. Once emptied, the tank was taken out of service and remained in place until it was taken to the size-reduction facility in Building 776 sometime shortly thereafter. Once size-reduced, the tank was disposed of as radioactive waste. When the tank was removed to the size-reduction facility, the concrete slab was decontaminated until the point where smear samples did not detect further removable radioactivity. Paint was applied to the concrete to secure the fixed radioactivity. The slab was moved to a ditch directly north of the area and buried at a probable depth of less than 10 ft. The area was paved sometime prior to June 1969. In the mid-1970s, Building T771A, a prefabricated structure, was constructed in the same general area. Interviewees familiar with the tank and the buried pad did not recall any subsequent excavation of the slab (DOE 1992).

In early 2003, information provided by a former employee who had been involved in the burial of the slab indicated that the burial site had been incorrectly located in the 1992 HRR

(DOE 1992). Based on the information provided, the slab was buried approximately 50 ft north of the original IHSS 163.2 location, in an area later covered by the North Patrol Road. This information was discussed with CDPHE and EPA on February 27, 2003, resulting in an agreement to move the IHSS location. A contact record dated March 7, 2003 documents the decision.

IHSS Investigations

IHSS 163.2 was sampled in accordance with IASAP Addendum #IA-03-01 (DOE 2003). The five sampling locations originally proposed were moved approximately 50 feet north in response to the IHSS location change discussed above. Both surface and subsurface (to 6.5 ft bgs) soil samples were analyzed for radionuclides. Plutonium-239/240 and americium-241 were not detected in excess of background levels. Uranium-234, uranium-235, and uranium-238 were detected slightly in excess of background levels, with maximum activities of 5.394, 0.271, and 5.394 pCi/g, respectively. Based on these results, an americium-contaminated slab did not appear to have been buried in the area sampled. The Geoprobe used to collect the subsurface samples did not encounter buried concrete. In response to these results, three new locations were sampled in the original IHSS 163.2 area identified in the 1992 HRR (DOE 1992). Results for these samples indicated plutonium-239/240 and americium-241 were not present above background levels and uranium-234, uranium-235, and uranium-238 detected at maximum activities of 5.435, 0.347, and 5.435 pCi/g, respectively (DOE 2004). All radionuclide activities were well below RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), NFAA was recommended for IHSS 163.2 based on the following:

- All contaminant activities were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004) indicated that additional action was not necessary because erosion of soil at this location was not likely to affect surface water.

After review of the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 163.2 on February 6, 2004 (CDPHE 2004).

Comments

As explained above, the location of IHSS 163.2 was changed because of information received in 2003 from a past employee who recalled the burial of the americium-contaminated slab. The change was anticipated to be documented in the 2004 HRR Annual Update (DOE 2004), but is instead documented in this 2005 Update.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4, February 6.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-185

IHSS Number: 185

Current Operable Unit: 16

Former Operable Unit: 16

IHSS Group: Not Applicable

Unit Name: Solvent Spill

This Final Update to the HRR for PAC 700-185 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 185 is summarized in this update. The following HRR volumes contain IHSS 185 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1996 Annual (DOE 1996).

Date(s) of Operation or Occurrence

November 10, 1985

Historical Summary

The fork of a forklift punctured a 55-gallon drum of 1,1,1-trichloroethane on the southeastern dock of Building 707, causing approximately 4 gallons of the solvent to leak onto the loading dock and adjacent paved areas. The location of IHSS 185 is shown on Figure 21. Four bags of a commercial absorbent were used to clean up the spill. The absorbent was then placed in drums by the Fire Department and taken to a hazardous waste storage area (DOE 1992a).

The cleanup response action was immediate. Also, because of the high vapor pressure of 1,1,1-trichloroethane, any solvent remaining on the pavement would have volatilized rapidly. It is unlikely that solvent would have reached native soil material, and, therefore, it is unlikely that solvent could have been detected in soil samples. In addition, 1,1,1-trichloroethane was not detected in any of the eight groundwater samples collected between November 1989 and April 1992 from nearby downgradient monitoring well P218089 (DOE 1996).

IHSS Investigations

No IHSS 185-specific investigation was deemed necessary.

No Further Action Recommendation

An NFA was recommended because the solvent spill occurred on pavement and was cleaned up immediately. Because the vapor pressure of 1,1,1-trichloroethane is high, the transport pathways to soil were eliminated. In addition, analytical data for groundwater samples collected from monitoring well P218089 indicated no 1,1,1-trichloroethane contamination was present in groundwater.

Based on the above information, which was presented in the Final NFA Justification Document for OU 16, Low-Priority Sites (DOE 1992b), a CAD/ROD recommending No Action under

CERCLA for IHSS 185 was prepared (DOE 1994) and approved on October 28, 1994 (DOE et al. 1994).

Comments

CERCLA Five Year Review: The CAD/ROD for OU 16 (DOE 1994) indicates that a five-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

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

DOE, 1992b, Final No Further Action Justification Document for Operable Unit 16, Low-Priority Sites, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1994, Corrective Action Decision/Record of Decision for Operable Unit 16, Low-Priority Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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

DOE, CDPHE, and EPA, 1994, Corrective Action Decision/Record of Decision Declaration, Rocky Flats Environmental Technology Site, Golden, Colorado, October 28.

PAC REFERENCE NUMBER: 700-194

IHSS Number: 194

Current Operable Unit: 16

Former Operable Unit: 16

IHSS Group: Not Applicable

Unit Name: Steam Condensate Leak – 700 Area

This Final Update to the HRR for PAC 700-194 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 194 is summarized in this update. The following HRR volumes contain IHSS 194 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 1996 Annual (DOE 1996).

Date(s) of Operation or Occurrence

September 26, 1979

Historical Summary

A steam condensate line break occurred in the Building 707 area on September 26, 1979. The location of IHSS 194 is shown on Figure 21. The water from the line break flowed into the surface water drainage through Pond B-4 (PAC NE-142.8) to Walnut Creek. The steam condensate contained tritium at approximately 1,000 pCi/L. The volume of condensate that leaked was not determined, and it is unknown whether the area was paved at the time of the incident. On September 27, surface water drainage was diverted to Pond B-1 PAC NE-142.5) and the valve to Pond B-5 (PAC NE-142.9) was closed.

The State of Colorado site-specific standard for tritium activity in surface water was 500 pCi/L. Based on the rapid decay of tritium, which has a half-life of 12.26 years, the tritium activities in RFETS surface water were determined to be below the site-specific standard at the time an NFA Justification was prepared (DOE 1992b).

Between September 26 and 29, 1979, surface water sampling results from Pond B-4 ranged in tritium activity from less than 524 pCi/L to approximately 926 pCi/L. A 24-hour composite sample collected from Walnut Creek at Indiana Street on September 26 contained 1,163 pCi/L of tritium. A grab sample collected the next day from the sampling location contained approximately 700 pCi/L. The maximum tritium background activity in surface water is 980 pCi/L.

Additional sampling confirmed that tritium present in surface water would decay rapidly. Surface water samples collected from Pond B-1 in 1989 yielded a tritium activity of 360 pCi/L ± 200 pCi/L. In addition, groundwater samples collected from a nearby monitoring well contained tritium activities ranging from 110 to 383 pCi/L, within the range of background activities (390 pCi/L maximum) reported for alluvial groundwater.

IHSS Investigations

No IHSS 194-specific investigation was deemed necessary.

No Further Action Recommendation

Because of the rapid decay rate of tritium and because tritium activities associated with this IHSS were within background levels and the site-specific standard, NFA was recommended for IHSS 194. Based on information presented in the Final NFA Justification Document for OU 16, Low-Priority Sites (DOE 1992b), a CAD/ROD recommending No Action under CERCLA for IHSS 194 was prepared (DOE 1994) and approved on October 28, 1994 (DOE et al. 1994).

Comments

CERCLA Five Year Review: The CAD/ROD for OU 16 (DOE 1994) indicates that a five-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

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

DOE, 1992b, Final No Further Action Justification Document for Operable Unit 16, Low-Priority Sites, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1994, Corrective Action Decision/Record of Decision for Operable Unit 16: Low-Priority Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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

DOE, CDPHE, and EPA, 1994, Corrective Action Decision/Record of Decision Declaration, Rocky Flats Environmental Technology Site, Golden, Colorado, October 28.

PAC REFERENCE NUMBER: 700-214

IHSS Number: 214

Current Operable Unit: IA

Former Operable Unit: 10

IHSS Group: 700-8

Unit Name: 750 Pad – Pondcrete/Saltcrete Storage

This Final Update to the HRR for PAC 700-214 consolidates the information in the initial 1992 HRR with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 214 is summarized in this update. The following HRR volume contains IHSS 214 information:

Original Report – 1992 (DOE 1992a).

Date(s) of Operation or Occurrence

1969 to 2003

Historical Summary

The 750 Pad (RCRA Unit 25) was constructed in 1969 and was initially used as a parking lot for Building 750. The location of IHSS 214 is shown on Figure 21. According to the IASAP (DOE 2001), the 750 Pad was constructed of a 6-inch-thick aggregate layer overlain by a 2-inch-thick asphaltic concrete layer. The pad was located approximately at grade, and sloped 2 percent to the east. Of the original 220,000 ft^2, 104,000 ft^2 was used for waste storage.

Waste storage began on November 18, 1986. In 1986, prior to start of waste storage, 142,000 ft^2 of the 750 Pad was covered with Petromat and 3 inches of asphalt, and 8-inch-high asphalt berms were constructed along the east and portions of the northern and southern sides of the pad (DOE 2001).

Runoff from the 750 Pad was collected in seven stormwater inlets between 10th Street and the 750 Pad. The stormwater inlets were directly piped to a culvert that drained to South Walnut Creek. All runoff water storage behind the 8-inch berm occurred in the immediate vicinity of the stormwater inlets. Calculated storage potential behind the berm was approximately 500 ft^3. Any precipitation event that exceeded approximately 0.03 inch resulted in runoff flowing over the berms (DOE 2001).

Pondcrete and saltcrete were stored within the bermed area of the 750 Pad. Pondcrete was a LLMW composed of sludge or sediment from the SEP mixed with Portland cement. Saltcrete was a LLMW composed of process waste from Building 374 mixed with Portland cement. The material was placed in polyethylene-lined, 3/4-inch plywood boxes measuring 4 ft by 2.5 ft by 7 ft, and stacked three high on the pad. Metal boxes measuring 4 ft by 4 ft by 7 ft were also used (DOE 2001).

Production of pondcrete ceased on May 23, 1988, in response to spills on the 904 Pad. During a detailed inspection of waste stored on the 750 Pad, approximately 5 percent (440) of pondcrete boxes were identified as being of poor quality (that is, containing unhardened pondcrete).

Severely deformed boxes of waste were transferred to metal boxes or to Building 788 and stored for reprocessing.

Between November 1, 1988, and July 25, 1989, a total of 64 saltcrete boxes were identified as leaking during routine inspections. Approximately 113 pounds of saltcrete leaked or spilled on to the 750 Pad. The spill locations were cleaned by vacuuming until radiation levels measured below detection limits on the instruments being used for the cleanup. The quantity of saltcrete that was retrieved is unknown.

From November 18, 1986, to September 1, 1989, two spills of pondcrete occurred. The spills, totaling approximately 0.5 ft^3, were released to the asphalt pad. Both spills consisted of unhardened SEP sludge and cement. Following each incident, the entire contents of the failed container and spilled pondcrete were transferred to metal boxes. The spill locations were then cleaned using water and brooms to scrub the 750 Pad surface remove pondcrete from the crevices in the asphalt. Water was collected using wet vacuums. Cleaning continued until radiation levels measured below detection limits on the instruments being used for the cleanup.

In May 1990, wet and severely deformed cardboard boxes were observed being transported into storage tents. Torn boxes with exposed plastic inner liners were also observed (DOE 2001).

Portable air monitors were moved to the 750 Pad shortly after the spill incidents. Based on these air monitors, no releases exceeded the Site Screening Guide for plutonium (0.01 picocuries per cubic meter [pCi/m^3]). No soil monitoring was conducted at the 750 Pad to determine whether precipitation had transported contaminants to the soil (DOE 2001).

According to the HRR (DOE 1992), portable buildings were constructed to prevent precipitation from coming in contact with the waste. Pondcrete was being stored at the 750 Pad as late at 2001 (DOE 2001).

Beginning in the mid-1990s, SEP sludge was stored in tanks. Units 750.2A, B, and C were comprised of 82 10,000-gallon tanks. Each tank was double-walled and constructed of HDPE. Seventy-nine tanks were used to store sludge that was generated from the SEP remediation project. The remaining three tanks were never used, but they served as overfill protection. Twenty-seven of the tanks contained sludge generated from SEP Ponds A and B, and the remaining 52 tanks were filled with waste generated from SEP Pond C and the clarifier. The sludge was characterized with EPA hazardous waste codes F001, F002, F005, F006, F007, and F009. In addition, after the SEP sludge was removed from Tank 25.077, the tank was reused to process sludge from Building 374. The additional EPA hazardous waste codes for this tank were P030, P098, P099, P106, U003, U103, and U108.

The closure methods employed for these tanks were documented in PRO-1505-750Pad-PSTANK-DECON, Pond Sludge Tank Decontamination for 750 Pad Project. Tank decontamination methodology consisted of waste removal, high-pressure wash, size reduction, cleaning/decontamination, and verification of “clean debris surface” as defined in Part 268, Table 1, Note 3. The tank pieces and ancillary equipment were either packaged as sanitary waste, LLW, or LLMW. In general, tank pieces with no visible pond sludge material/debris or that had no contact with the sludge were managed as sanitary waste. Tank pieces with visible pond sludge material/debris that were verified clean after being rinsed and wiped down with a decontamination solution were managed as LLW. Tank pieces with visible pond sludge were

managed as LLMW. All waste was packaged and shipped offsite for disposal. The last tank was removed by December 18, 2003.

All pondcrete and saltcrete were removed from the Pad and disposed of offsite. The 750 Pad was removed during 2005 (DOE 2005). The top 0.6 to 1.0 centimeters (cm) of asphalt was removed and disposed of as hazardous waste. The remainder was removed and disposed of as sanitary waste.

The 750 Pad was a RCRA-permitted unit and was treatment, storage, and disposal (TSD)-compliant for secondary containment and enclosure to prevent runon and runoff. Responses to spills were conducted in accordance with the permit emergency response requirements, including implementing the Contingency Plan when required.

IHSS Investigations

Surface and subsurface soil and sediment samples were collected from 15 sampling locations around the 750 Pad in accordance with the Phase I RFI/RI Work Plan for OU 10 (DOE 1992b). Samples were analyzed for radionuclides, metals, VOCs, and SVOCs. Plutonium-239/240 and americium-241 activities, and cyanide, nitrite, and metal concentrations in soil were greater than MDLs or background at several locations. The maximum detected activities of americium-241 and plutonium-239/240 were 1.13 and 0.12 pCi/g, respectively. VOCs and PAHs were also detected at several locations (DOE 1995). All contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE 2004a, DOE et al. 2003).

Analysis of surface water samples collected in the area of IHSS 214 indicated the presence of gross alpha, gross beta, nitrate, cyanide, and cadmium. Analysis of groundwater samples collected from upgradient well P207389 indicated detections of metals and other inorganics including calcium, magnesium, manganese, and sulfate. Radionuclides detected include americium-241, tritium, uranium-233, uranium-235, and uranium-236 (DOE 2001). No downgradient analytical data were available.

Accelerated action characterization soil sampling was conducted from August 31, 2004, through September 28, 2004, in accordance with IASAP Addendum #IA-04-12 (DOE 2004b). Surface and subsurface soil samples were collected from 55 locations (statistical and biased). Statistical sampling locations were selected using a 22-meter sampling grid, and biased sampling locations targeted known spill areas, paved areas where the asphalt was cracked or failing, and paved areas that had been patched or repaired. Sediment samples were collected from the seven storm drain inlets located along the eastern perimeter of the 750 Pad. Samples were analyzed for radionuclides, metals (including beryllium and lithium), PCBs, and SVOCs. In addition, the 55 subsurface soil samples were analyzed for VOCs. No contaminant activities or concentrations in surface or subsurface soil at IHSS 214 were greater than the RFCA WRW soil ALs (DOE 2004a, DOE et al. 2003). Plutonium-239/240 and americium-241 activities did not exceed background levels in surface soil samples and americium-241 did not exceed background in subsurface soil samples. Plutonium-239/240 was detected in one subsurface soil sample at an activity of 0.051 pCi/g. Aroclor-1260 was detected in two surface and one subsurface soil sample at a maximum of 16 μg/kg in surface soil and 40 μg/kg in subsurface soil. Aroclor-1254 was detected at 38 μg/kg in one subsurface soil sample. Pentachlorophenol was detected in one subsurface soil sample at 470 μg/kg. A majority of the remaining detections were of uranium isotopes at levels

slightly above background, and PAH compounds at levels well below RFCA WRW soil ALs (DOE 2004a, DOE et al. 2003).

All waste was removed from the 750 Pad in 2005 and the Pad was removed (DOE 2005).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for IHSS 214 based on the following:

- Residual COC activities and concentrations in IHSS 214 were less than RFCA WRW soil ALs.
- Results of the SSRS presented in the Data Summary Report for IHSS Group 700-8 (DOE 2004a) indicated that additional action was not necessary because the soil was not in an area susceptible to erosion and did not contain enough contaminants and a sufficient pathway to cause an exceedance of surface water standards.

After review of the Data Summary Report for IHSS Group 700-8 (DOE 2004a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 214 on December 17, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 700-8, December 17.

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

DOE, 1992b, Final Phase I RFI/RI Work Plan Other Outside Closures (Operable Unit No. 10), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995, Draft Technical Memorandum 1 Operable Unit No 10 Other Outside Closures, Rocky Flats Plant, Golden, Colorado, January

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

DOE, 2004a, Data Summary Report for IHSS Group 700-8, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004b, Final Industrial Area Sampling and Analysis Plan FY04 Addendum #IA-04-12, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2005, Closure Summary Report for the 750 Pad, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-215

IHSS Number:	215
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-4
Unit Name:	Process Waste Tank Unit 55.13 (Tank T-40)

This Final Update to the HRR for PAC 700-215 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 215 is summarized in this update. The following HRR volumes contain IHSS 215 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1963 to September 1989

Historical Summary

The location of IHSS 215 is shown on Figure 21. The concrete mixed-waste storage tank (Tank T-40 also called Tank 13), adjacent to Room 103 of Building 771, was constructed in 1963. The roof of the tank served as the floor of Room 203. The tank held sludge from second-stage precipitation of liquid process waste from Building 771. Effluent from a silver recovery unit in Building 774 was also stored in the tank. Use of Tank T-40 ceased when the tank was replaced in September 1989.

IHSS Investigations

In accordance with IASAP Addendum #IA-03-01 for IHSS Group 700-4 (DOE 2003), five surface soil characterization samples targeting IHSS 215 were collected as part of accelerated action activities for IHSS Group 700-4 in fall 2003. Samples were analyzed for radionuclides, SVOCs, metals, and nitrate. Analytical results indicated americium-241 was present at an activity of 1.2 nCi/g and plutonium-239/240 was present at an activity of 1.69 nCi/g at the southeastern corner of the IHSS. In addition, americium-241 was present at an activity of 116 pCi/g and plutonium-239/240 at 943 pCi/g at the southwestern corner of the IHSS. All other analyte concentrations were less than RFCA WRW soil ALs. Analytical results from the characterization are presented in the ER RSOP Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b). Because the americium-241 and plutonium-239/240 were at depths greater than 6 ft beneath the surface, no action was required in accordance with RFCA (DOE et al. 1996, 2003).

During D&D of Building 774, Tank T-40 was removed.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA determination was justified for IHSS 215 in the ER Notification and Closeout Report for IHSS Group 700-4 (DOE 2004b). Migration of subsurface contaminants in IHSS 215 to surface water through erosion is unlikely because the locations with results greater than RFCA WRW soil ALs (DOE et al. 2003) will be well below the ground surface (at least 6 ft at Buildings 771 and 774) after D&D actions are complete.

After review of the ER RSOP Notification and Closeout Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 215 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4 (B771 & 774) - Approval, February 6.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado

PAC REFERENCE NUMBER: 700-1100

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-3
Unit Name:	French Drain North of Buildings 776/777

This Final Update to the HRR for PAC 700-1100 consolidates the information in the initial 1992 HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1100 is summarized in this update. The following HRR volume contains PAC 700-1100 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

Approximately 1963 to 1972

Historical Summary

A French drain, which was in use from approximately 1963 until at least 1972 and then removed, ran north from Door 17 of Building 776, across the alleyway, then east where its effluent leached into the soil. The location of PAC 700-1100 is shown on Figure 21. Radioactive contamination at this site was the result of the June 1964 explosion and release of plutonium in Building 776 (see discussion under PAC 700-131, DOE 1992). The area was again contaminated at the time of the May 1969 fire in Building 776. This drain may have provided a pathway for the migration of radioactive contamination. Another source indicated the French drain ran north from Door 14 of Building 776 (three doors to the west). Plutonium contamination present at this site as a result of the 1964 and 1969 incidents was possibly redistributed below the ground surface, although no surface expression was noted.

No documentation was found that discusses removal of the French drain. The drain could not be located in the RFETS Utility Drawings. The drain was not encountered during the IHSS Group 700-3 characterization and remediation (DOE 2005a) or building demolition as documented in the Decommissioning Closeout Report for the 776/777 Closure Project (DOE 2005b).

PAC Investigations

Fifteen surface soil samples were collected from the IHSS 131 and PAC 700-1100 areas during the OU 8 Phase I RFI/RI in accordance with the Phase I RFI/RI Work Plan for OU 8, 700 Area (DOE 1994). Seven of these were within or immediately adjacent to PAC 700-1000. Soil samples were analyzed for radionuclides, metals, VOCs and SVOCs. Plutonium-239/240 and americium-241 were detected at maximum activities of 0.54 and 0.10 pCi/g. Uranium-238 was detected at a maximum activity of 1.79 pCi/g and uranium-234 and uranium-235 were not detected above background. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 1995, 2005a, DOE et al. 2003).

PAC 700-1100 was investigated as part of the accelerated action activities for IHSS Group 700-3 (DOE 2005a), which included soil characterization, as well as removal of Building 730, the Building 701 slab and associated radioactive hot spots, Tanks T-9 and T-10, waste lines, and soil contaminated with solvents, oil, fuel, and radionuclides. Surface and subsurface samples were collected from 10 sampling locations within and around PAC 700-1100 in accordance with IASAP Addendum #IA-03-04 for IHSS Group 700-3 (DOE 2003). Only one of the samples was within the exact footprint area of PAC 700-1100, but a majority were within several feet of it. Samples were analyzed for radionuclides, metals, VOCs, and SVOCs. Plutonium-239/240 and americium-241 were not detected at activities greater than background in any samples. Uranium-234, uranium-235, and uranium-238 were detected in surface soil at maximum activities of 4.114, 0.235, and 4.114 pCi/g in surface soil and 3.986, 0.195, and 3.986 pCi/g in subsurface soil.

Benzo(a)pyrene concentrations exceeded the RFCA WRW soil AL (DOE et al. 2003) in two subsurface soil samples collected at depths of 2.5 to 4.5 ft bgs and 4.5 to 6.5 ft bgs at a sampling location within IHSS 131 approximately 12 ft south of the PAC 700-1100 boundary. Both samples had benzo(a)pyrene concentrations of 5,200 µg/kg, which exceeds the RFCA WRW soil AL of 3,490 µg/kg (DOE et al. 2003). Arsenic concentrations exceeded the RFCA WRW soil AL (DOE et al. 2003) in two samples from 4.5 to 6.5 ft bgs. The maximum concentration of arsenic was 44 mg/kg, while the RFCA WRW soil AL is 22.2 mg/kg (DOE et al. 2003). Chromium was detected at a concentration greater than the RFCA WRW soil AL (DOE et al. 2003) in one sample collected at 4.5 to 6.5 ft bgs. Chromium was detected at 11,000 mg/kg while the RFCA WRW soil AL is 268 mg/kg.

The arsenic and chromium exceedances occurred at locations in IHSS 131 within approximately 5 ft of the boundary of PAC 700-1100. These exceedances did not require remediation under RFCA, however, soil from IHSS 131 and PAC 700-1100 was excavated as part of a RFCA (DOE et al. 1996) accelerated action implemented in accordance with ER RSOP Notification #04-04 (DOE 2004). The excavation required to remove Tanks T-9, T-10, and Building 730 extended into the northeastern portions of IHSS 131 and PAC 700-1100. Details are provided in the IHSS Group 700-3 Closeout Report (DOE 2005a).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for PAC 700-1100 based on the following:

- Surface soil analytical results were less than RFCA WRW soil ALs (DOE et al. 2003). Subsurface soil analytical results were less than RFCA WRW soil ALs (DOE et al. 2003) with the exceptions noted above.
- Results of the SSRS presented in the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005a) indicated that additional action was not necessary because the area is not erodable and does not contain enough contaminants and a sufficient pathway to cause an exceedance of surface water standards.

After review of the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 700-1100 on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 1994, Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995, Draft Data Summary, Operable Unit 8, 700 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, IHSS Group 700-3 Area, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #04-04, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005a, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005b, Decommissioning Closeout Report for the 776/777 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1101

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-10
Unit Name:	Laundry Tank Overflow – Building 732

This Final Update to the HRR for PAC 700-1101 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1101 is summarized in this update. The following HRR volumes contain PAC 700-1101 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

June 26, 1979

Historical Summary

PAC 700-1101 consisted of the following two parts of Building 732: a reinforced-concrete stairwell approximately 7 by 17.6 ft in area and 8 ft high, and an underground, reinforced-concrete room, 14 by 27.7 ft in extent. The location of PAC 700-1101 is shown on Figure 21. The stairwell descended to the south and then opened to the east into the concrete room. Undisturbed soil below the room was approximately 13.7 ft below existing grade. Within the room was a 1,000-gallon fiberglass holding tank (T-4), two pumps, and two banks of particulate filters. In the southeastern corner of the room was a sump that was 1.5 by 1.5 ft in area and 2 ft deep. There were no process lines or foundation drains under the building. At the time of construction, the walls of Building 732 were waterproofed on the inside and outside. In the early 1990s additional sealant was applied to all exterior-wall, ceiling, and floor joints (DOE 2004b).

Under normal operations, laundry water and water from floor drains in Building 778 were pumped to Building 732, filtered, and then passed on to Valve Vault 9, eventually reaching Building 374 for treatment. Water collected in the Building 732 sump was pumped back to a secondary containment sump in Building 778. From there it was returned to the tank in Building 732 (DOE 2004b).

In June 1979, laundry wastewater in Tank T-4 overflowed onto the room floor because of malfunctioning pumps that normally sent 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 any laundry water released to the environment could have been LLW (DOE 2004b).

PAC Investigations

Accelerated action characterization activities at PAC 700-1101 were conducted in accordance with IASAP Addendum #IA-04-07 (DOE 2004c). Twenty subsurface soil samples were collected from four soil boring locations and analyzed for radionuclides and VOCs. One sample of incidental water (categorized as groundwater) was analyzed for metals. The water was found covering the floor of the sump during field sampling. Uranium isotopes were detected at activities slightly exceeding background levels at each of the four subsurface soil sampling locations. The maximum detected concentrations of uranium-234, uranium-235, and uranium-238, respectively, were 5.674, 0.362, and 5.674 pCi/g (DOE 2004b). No other radionuclides were detected at levels exceeding background. A number of VOCs were detected at concentrations slightly above the detection limits, but four to seven orders of magnitude below the applicable RFCA WRW soil ALs (DOE et al. 2003). The most frequently detected VOC was trichloroethene, with a maximum concentration of 8.4 µg/kg (DOE 2004b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for PAC 700-1101 based on the following:

- Contaminant concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Data Summary Report for IHSS Group 700-10 (DOE 2004b) indicated that additional action was not necessary because the area is not erodable and does not contain enough contaminants and a sufficient pathway to cause an exceedance of surface water standards.

After review of the IHSS Group 700-10 Data Summary Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status of PAC 700-1101 in a letter dated September 21, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 700-10, PAC 700-1101 Laundry Tank Overflow – Building 732, September 21.

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

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 700-10, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004c, 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, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1102

IHSS Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Transformer Leak – 776-4

This Final Update to the HRR for PAC 700-1102 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1102 is summarized in this update. The following HRR volumes contain PAC 700-1102 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996);
Update Report – 1997 Annual (DOE 1997a);
Update Report – 2000 Annual (DOE 2000);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Prior to September 1986

Historical Summary

The location of PAC 700-1102 is shown on Figure 21. Prior to January 1986, Transformer 776-4 was located approximately 100 ft west of the northwestern corner of Building 776. The transformer pad at this location was positioned on an incline with drainage toward an access road 15 ft east. In January 1986, a Plant employee reported that a leak was observed from Transformer 776-4. In February 1986, the transformer was again reported to be leaking on the radiator and around the gauges, valves, and bushing compartment. There was an oily film on most of the transformer surfaces and the transformer pad. In an August 1986 photograph, staining was visible on the concrete pad beneath the transformer. Further leaking was reported in August and September 1986. Samples collected in November 1986 of the concrete under the transformer drain valve, as well as soil at the southern edge of the transformer pad, had elevated levels of PCBs (DOE 1992). The transformer was moved to a new pad several feet north in 1987 (DOE 1996).

In September 1976, the oil in Transformer 776-4 had a PCB concentration of approximately 5 percent (using a PCB test kit). Samples of the oil collected in November 1977 indicated the fluid in the transformer had a PCB concentration of approximately 3 percent. In October 1985, the oil was reported to have a PCB concentration greater than 500 ppm (test method unknown). In November 1986, wipe samples collected from a valve, sidewall, and the concrete pad were found to contain 29.8, 5.0, and 417.5 ppm PCBs, respectively. Also in November 1986, a wipe sample collected from the concrete pad beneath the drain valve was found to contain 498 $\mu g/cm^2$ PCBs. Soil samples collected in November 1986 from the southern edge of the original transformer pad indicated 14,900 ppm PCB contamination (DOE 1992).

In September 1976, Transformer 776-4 was documented as being drained and refilled with a non-PCB silicone oil. The transformer was scheduled for replacement under the PCB Fire Hazard Elimination Project in FY1988. The transformer was removed for retrofilling and relocated several feet north in 1987. The original transformer pad surface was partially removed (scabbled) to a depth of 4 inches and left in place. In March 1989, it was reported that Transformer 776-4 was replaced under the Environmental Hazards Elimination Project.

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The highest PCB concentration found in soil adjacent to the old PAC 700-1102 concrete transformer pad was 480 ppm Aroclor-1260; other Aroclors were not detected (DOE 1991).

In accordance with the agency-approved Final PAM for Remediation of PCBs (DOE 1995), additional samples were collected in 1995 and 1996 to verify the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Draft Method 4020, and concrete samples were analyzed using EPA Method 8080. Based upon analytical results for the concrete samples, the highest PCB level on the concrete pad was 56 ppm.

In accordance with the PAM, approximately 177 cy of PCB-contaminated soil and 10.7 cy of PCB-contaminated concrete were excavated to a depth of 17 ft, containerized, and shipped offsite for disposal (DOE 1997b). A 20-ft^2 area of soil at the bottom of the excavation (17 ft), remained PCB-contaminated. Soil at the bottom of the excavation had a residual PCB concentration of 70 ppm using EPA Method 8080, as documented in the Closeout Report for the Source Removal of PCBs (DOE 1997b). Excavation was stopped because of equipment limitations and health and safety concerns. The excavation was filled with clean structural backfill in 1996.

PAC 700-1102 was recommended for NFA in the 1997 Annual Update to the HRR (DOE 1997a); however, comments received from the regulatory agencies on July 19, 1999, indicated that additional groundwater samples should be collected to ensure that PCB contamination was not mobilized in the subsurface. Groundwater samples were collected for PCBs during FY2001 at two downgradient locations: well 22696 and the Building 771/776 tunnel. The underground tunnel connecting Buildings 776 and 771 is immediately east of PAC 700-1102 and approximately 23 ft in depth. These locations are shown on Figure 2.11 of the 2001 HRR Annual Update (DOE 2001). Groundwater samples did not contain detectable concentrations of PCBs.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future

cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Although the residual Aroclor concentration at PAC 700-1102 was 70 ppm, well above the 10 ppm level noted above, the contamination is at a depth of 17 ft, which precludes direct human exposure to the soil. Therefore, there is no human health risk associated with the residual contamination.

Groundwater samples were collected and analyzed downgradient of PAC 700-1102, and PCBs were not detected. In accordance with RFCA (DOE et al. 1996), NFAA was recommended for PAC 700-1102 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c) based on the site data, groundwater data, and White Paper findings noted above.

After review of the NFAA justification by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 700-1102 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: No Further Accelerated Action Justification for PCB Potential Areas of Concern (April 15, 2004), May 6.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Closeout Report for the Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of Their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1103

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Leaking Transformers – Building 707

This Final Update to the HRR for PAC 700-1103 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1103 is summarized in this update. The following HRR volumes contain PAC 700-1103 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

November 1986 to 1987

Historical Summary

The location of PAC 700-1103 is shown on Figure 21. Transformers 707-1 through 707-6 were located on the eastern side of the Building 707 roof. Concrete under several of the transformer drain valves was found contaminated with PCBs in November 1986 (DOE 1992). A leak from Transformer 707-1 was discovered in 1987 during routine maintenance when the transformer was found to be low in dielectric coolant oil. Visible evidence of the leak was observed around the valve area and weld seams. Analytical data of soil and swipe samples confirmed that the pad on the roof and soil on the ground immediately east of Building 707 were contaminated with PCBs. The soil contamination resulted from rainwater collecting on the rooftop where the transformers were located, then being released through a downspout to the ground (DOE 1992).

Wipe samples collected from the concrete under several of the transformer drain valves were analyzed in November 1986. PCB concentrations ranged from 135 to 7,200 ppm. The concentration of PCBs in the soil immediately under the downspout was 1,600 ppm (DOE 1992).

In March 1991, 13 surface and subsurface soil samples were collected to identify PCB concentrations. Results from a sample immediately east of Building 707, under a downspout suspected of being a migration pathway from the contaminated rooftop, indicated PCB concentrations of 1,600 ppm in the surface and 180 ppm between 1.0 and 1.5 ft in depth. PCB concentrations decreased with distance outward from the building to approximately 9.7 ppm in surface soil and less than 1.0 ppm in subsurface soil (DOE 1991).

PAC Investigations

In 1992, an extensive TSCA cleanup of PCB contamination on the 707 rooftop was performed that included removal of the leaking 707-1 transformer, repair of the transformer, cleanup of the concrete rooftop to achieve a cleanup standard of 100 milligrams per 100 centimeters

(mg/100 cm), and subsequent replacement of the repaired transformer. The 707-1 transformer was retrofilled with non-PCB dielectric oil and reenergized (DOE 1996).

Under the approved Final PAM for Remediation of PCBs (DOE 1995), further sample screening was completed in July and August 1995 using MRI methods (EPA 1986) to verify the lateral and vertical extent of PCB migration. Approximately 67 cy of PCB-contaminated soil was excavated from the site. The soil was containerized and shipped offsite for disposal in September 1995 (DOE 1997). PCB levels remaining in the soil were less than 10 ppm using EPA Method 4020 (Immunoassay Field Technique) and less than 12 ppm (5 ppm Aroclor-1260 and 7 ppm Aroclor-1254) using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the Method 4020 Immunoassay Field Technique. The excavation was backfilled and regraded upon receipt of Method 8080 cleanup confirmation sampling results in August 1995.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

In accordance with RFCA (DOE et al. 1996), an NFAA was justified as appropriate for PAC 700-1103 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c) based on the site remediation and confirmation data, and the White Paper findings noted above.

After review of the NFAA justification by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 700-1103 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: No Further Accelerated Action Justification for PCB Potential Areas of Concern (April 15, 2004), May 6.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE, 1997, Closeout Report for the Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of Their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 1986, Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup, Office of Toxic Substances, EPA-560/5-86-017, Washington, D.C., May.

PAC REFERENCE NUMBER: 700-1104

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Leaking Transformer – Building 708

This Final Update to the HRR for PAC 700-1104 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1104 is summarized in this update. The following HRR volumes contain PAC 700-1104 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

November 1986 through 1987

Historical Summary

The location of PAC 700-1104 is shown on Figure 21. Transformer 708-1 was located on the western side of Building 708. In February 1987, concrete under the Transformer 708-1 drain valve was found to be contaminated with PCBs. According to an interview with utility personnel, electrical equipment located west of Building 708 leaked PCB-contaminated oil prior to 1987 (DOE 1992).

Two wipe samples collected from the concrete under the Transformer 708-1 drain valve were analyzed and found to contain 1,035 and 3,750 ppm PCBs (DOE 1992).

PAC Investigations

Four transformers were removed and retrofilled in 1987. Rock and gravel fill were placed around the transformer pads prior to replacement with non-PCB transformers in 1987 or 1988.

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, soil samples were collected in accordance with approved EPA sampling protocols and analyzed for PCBs. The highest PCB concentration of 860 ppm Aroclor-1254 was found in a soil sample collected adjacent to the concrete transformer pads; no other Aroclors were detected at this site (DOE 1991).

Under the approved Final PAM for Remediation of PCBs (DOE 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Method 4020. In accordance with the PAM (DOE 1995), approximately 21 cy of PCB-contaminated soil were excavated, containerized, and shipped offsite for disposal (DOE 1997). The cleanup verification analytical results for PCBs in the soil were less than 10 ppm using EPA Method 4020, and less than 3.2 ppm using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the EPA

Method 4020 (Immunoassay Field Technique) analytical results. There were no detections of PCBs on the concrete transformer pad using EPA Method 8080.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

In accordance with RFCA (DOE et al. 1996), an NFAA was recommended as appropriate for PAC 700-1104 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c) based on the site remediation and confirmation data, and the White Paper findings noted above.

After review of the NFAA justification by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 700-1104 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: No Further Accelerated Action Justification for PCB Potential Areas of Concern (April 15, 2004), May 6.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE, 1997, Closeout Report for the Source Removal of PCBs, Revision 0, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of Their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1105

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-7
Unit Name:	Transformer Leak – 779-1 and 779-2

This Final Update to the HRR for PAC 700-1105 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1105 is summarized in this update. The following HRR volumes contain PAC 700-1105 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1957 to 1998

Historical Summary

Prior to 1987, dielectric fluid containing PCBs leaked from Transformers 779-1 and 779-2, formerly located on the northeastern side of Building 779 adjacent to the southern side of the 779 loading dock. The location of PAC 700-1105 is shown on Figure 21. In 1987, the transformers were retrofilled with non-PCB dielectric fluid and then moved several feet east and north (DOE 2004b). The transformers were removed during the FY00 facility demolition (DOE 2000).

PAC Investigations

A surface soil sample from sampling location SS481194 indicated the presence of PCBs at 21,000 µg/kg. Preaccelerated action surface soil samples were also collected at six locations around the transformer pads for PCB and isotopic analyses. Aroclor-1260 was detected in all six samples, from 15,000 to 680,000 µg/kg. Plutonium-239/240 was detected in all samples; the highest activity was 115 pCi/g (DOE 2004b).

Additional surface and subsurface soil characterization samples were collected from eight sampling locations during the IHSS Group 700-7 accelerated action in accordance with IASAP Addendum #IA-03-15 (DOE 2003a). Analytes included radionuclides and PCBs. Samples from one location were also analyzed for VOCs and SVOCs. PCB concentrations exceeded the RFCA WRW soil AL of 12,400 µg/kg (DOE et al. 2003) at six locations in surface and subsurface intervals located around the PCB transformer pads. Surface soil concentrations greater than the WRW soil AL ranged from 16,000 to 860,000 µg/kg. Subsurface soil concentrations greater than the WRW soil AL ranged from 19,000 to 24,000 µg/kg. Other contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE 2004b, DOE et al. 2003).

A RFCA (DOE et al. 1996) accelerated action was implemented in accordance with ER RSOP Notification #03-10 (DOE 2003b). Based on accelerated action characterization data, soil around

the transformers was removed, as well as the concrete pads that held the transformers and the associated trough. Removal of PCB-contaminated soil at four locations around the transformers required two rounds of soil removal. Grab samples were collected at the bottom of the initial excavations (5.0 to 5.3 ft below grade), and analytical results indicated PCB soil concentrations were still greater than the RFCA WRW soil AL (DOE et al. 2003). An additional 1 ft of soil was then removed from each location, and the bottom of each subsequent excavation was sampled. Approximately 81 cy of PCB-contaminated soil was removed from around and under the PCB transformer pads. The depth of the excavation was approximately 5 to 6 ft and covered an area approximately 20 by 20 ft. The soil was disposed of as low-level radioactive TSCA waste. The excavation was backfilled and rough-graded. Final grading and subsequent seeding occurred after Buildings 776 and 777 were removed and the associated UBC Sites were remediated (DOE 2005).

Nine confirmation samples were collected and analyzed for PCBs. Results indicated that all PCB concentrations were less than RFCA WRW soil ALs (DOE 2004b, DOE et al. 2003).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for PAC 700-1105 based on the following:

- Accelerated action confirmation data indicate that residual PCB concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 700-7 (DOE 2004b) indicated that additional action was not necessary.

After review of the Closeout Report for IHSS Group 700-7 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 700-1105 on October 1, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-7 (B779) - Approval, October 1.

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

DOE, 2000, Decommissioning Closeout Report for the 779 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-15, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-10, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report for IHSS Group 700-7, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Closeout Report for IHSS Group 700-3 UBCs, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1106

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-12
Unit Name:	Process Waste Spill – Portal 1

This Final Update to the HRR for PAC 700-1106 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1106 is summarized in this update. The following HRR volumes contain PAC 700-1106 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

November 1986

Historical Summary

The location of PAC 700-1106 is shown on Figure 21. Approximately 10 gallons of process wastewater spilled from a tank truck at the entrance to Portal 1. The truck was en route from the Valve Vault 12 leak area (PAC 300-186) to SEP Pond 207-A (Building 762A). The tank was overfilled, and the liquid splashed out of the top manhole when the truck was driven around a corner.

Process wastewater from the Valve Vault 12 leak was released onto the street. Analysis of water samples collected from Valve Vault 12 and a related process waste line leak indicated the total alpha activity was 170,000 pCi/L and uranium-238 activity was 120,000 pCi/L. It was determined at the time of the spill that there was no radioactivity on the street. No other historical documentation could be found which further detailed a response to the release.

PAC Investigations

In accordance with IASAP Addendum #IA-02-01 (DOE 2001), two surface soil characterization samples were collected on April 4, 2002, and analyzed for radionuclides. The only result exceeding background levels was uranium-235 at 0.11 pCi/g. No other radionuclides were present at levels exceeding background. Analytical results were well below RFCA Tier II soil (DOE et al. 1996) and WRW soil ALs (DOE et al. 2003). Analytical results from characterization samples for PAC 700-1106 are presented in the Data Summary Report for IHSS Group 700-12 (DOE 2003b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), NFAA status for PAC 700-1106 was justified in the Data Summary Report (DOE 2003b) for the following reasons:

- All contaminant concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).

- There was no identified potential to exceed surface water standards at a POC from this IHSS Group.

DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 700-1106 in a letter dated May 15, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Final Data Summary Report for IHSS Group 700-12, May 15.

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

DOE, 2001, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group 700-12, PAC 700-1106, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1107

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Compressor Waste Oil Spill – Building 776

This Final Update to the HRR for PAC 700-1107 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1107 is summarized in this update. The following HRR volumes contain PAC 700-1107 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

June 10, 1986, and June 12, 1986

Historical Summary

The location of PAC 700-1107 is shown on Figure 21. On June 10, 1986, an open oil drum filled with water from the Building 776 Compressor House roof. One or two gallons of oil flowed onto the road and were carried past Building 776 by rainwater. The oil originated from a sump trench in the Compressor House. On June 12, 1986, two to three gallons of compressor waste oil were spilled while transferring the oil from an overfilled drum. The spill occurred in the waste oil drum storage area north of Building 776 outside Door 15T (DOE 1992).

In response to the June 10th incident, "Oil-Dri®" was poured over the area to absorb the spilled oil and was subsequently disposed of in the Present Landfill (PAC NW-114). Two bags of oil absorbent were used on the June 12 spill (DOE 1992).

PAC Investigations

No further investigation was required because the PAC was dispositioned based on removal of the oil.

No Further Action Recommendation

PAC 700-1107 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the November 14, 2001, meeting and was formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, and T. Rehder, EPA, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 700-1108

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-11
Unit Name:	771/774 Footing Drain Pond (Bowman's Pond)

This Final Update to the HRR for PAC 700-1108 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1108 is summarized in this update. The following HRR volumes contain PAC 700-1108 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1999 Annual (DOE 1999a).

Dates(s) of Operation or Occurrence

1972 to November 2004

Historical Summary

The location of PAC 700-1108 is shown on Figure 21. PAC 700-1108 (Bowman's Pond) is part of IHSS Group 700-11, which also includes the Steam Condensate Tanks (PAC 700-139.1[N][a]). Both of these areas were located north of Building 774. Bowman's Pond consisted of a small, manmade depression approximately 3 to 4 ft deep with an area of approximately 28 by 33 ft. Bowman's Pond was constructed to retain water discharged from building foundation drains and storm drains in the 700 Area. The pond discharged to the east, saturating an area approximately 200 by 40 ft, resulting in a wetland environment. Generally, surface water drainage in the area flowed from southwest to northeast into North Walnut Creek (DOE 2005).

Leaks from tanks and perhaps other Building 774 processes affected Bowman's Pond. Underground process waste storage tanks, in use since the late 1950s (PACs 700-146.1 through 700-146.6) were removed from the southern side of Building 774 in 1972. Physical failure of these tanks resulted in chemical and radioactive contamination to the soil around Building 774. It was suspected that leakage from these tanks also seeped to the building footing drain tiles and was discharged into Bowman's Pond (DOE 1992).

Two steel 8,000-gallon aboveground condensate receiving tanks, located adjacent to and east of the Building 771/774 footing drain outfall (IHSS 139.1[N][a]), leaked. A storm drain north of IHSS 139.1(N)(a) may have conveyed water into Bowman's Pond.

A March 1971 report states that water coming from footing drains in the area contained as much as 500 dpm/L in gross alpha activity. Water samples collected from the Building 774 footing drain in April 1971 indicated 400 dpm/L plutonium and 800 ppm nitrate (DOE 1992).

On July 21, 1980, an 8-year-old process waste line was discovered leaking southeast of Building 774. Process wastewater was observed seeping up in the soil on the southern side of the

road southeast of Building 774. The leaking process wastewater flowed down slope and through a 30-ft culvert, along a chain-link fence, and under the fence at the corner. From this point, the liquid flowed under the unpaved access road into a boggy area (Bowman's Pond) north of Building 774. The vegetation in the boggy area was damaged where the spilled liquid formed a pool. It was estimated that approximately 1,000 gallons had leaked from the process waste line. Initial response to this incident was to stop the flow through the line thereby stopping the leak. When the soil dried, a FIDLER survey was conducted to determine the extent of resulting contamination. On July 24, 1980, the broken waste line was excavated and the problem was identified as a loose flange. Analysis of the spilled water indicated 2,500 pCi/L total alpha activity, 4,000 pCi/L gross beta activity, 10,000 mg/L nitrate, and a pH of 12 (DOE 1992).

A surface water and sediment sampling program identified PCB contamination within and around Bowman's Pond in summer 1991. The source of the PCBs was not determined; however, one employee recalled that a pole-mounted transformer north of Building 774 was hit by lightning and may have exploded (DOE 1991).

Results of a Biological Evaluation conducted by the U.S. Army Corps of Engineers in November 2001 determined that both Bowman's Pond and the condensate wetland near Bowman's Pond were not jurisdictional wetlands (K-H 2001).

PAC Investigations

In April 1999, an extensive characterization study was conducted at PAC 700-1108 and the adjacent steam condensate tanks (IHSS 139.1(N)(a)). The purpose of the investigation was to characterize the potential nature and extent of contamination in surface soil, subsurface soil/sediment, and surface water for the pond and surrounding depositional environments adjacent to the pond. Surface soil, subsurface soil, sediment, and surface water samples were collected from PAC 700-1108 and IHSS 139.1(N)(a) in April 1999 in accordance with an agency-approved SAP (DOE 1999b).

Accelerated action characterization activities for PAC 700-1108 were planned and executed in accordance with IASAP Addendum #IA-04-10 (DOE 2004a). Historical and accelerated action characterization data indicated that PCBs were present at concentrations in soil greater than RFCA WRW soil ALs (DOE et al. 2003) in four distinct locations around Bowman's Pond and associated drainages (western area, mid-western area, Bowman's Pond area, and eastern area). Each of the areas was located principally within the surface water drainage, or in the case of the eastern area, was impacted by the drainage. The western area coincided with the edge of Building 770, approximately 23 ft downstream of a storm drain outfall. The mid-western area coincided with a storm drain outfall, and the Bowman's Pond area coincided with a Building 771/774 foundation drain outfall. The eastern area hot spot consisted of one historical detection of PCBs greater than RFCA WRW soil ALs (DOE et al. 2003) and was located downstream of a storm drain and foundation drain. The limited areas where exceedances were found indicated that in all instances the contamination was associated with a drain or potential drain (DOE 2005).

Soil or sediment was collected from 32 characterization sampling locations. Several analytes were detected at concentrations greater than RFCA WRW soil ALs (DOE et al. 2003) including Aroclor-1254, arsenic, benzo(a)pyrene, and dibenz(a,h)anthracene. The maximum concentrations in surface soil or sediment were 54,000 μg/kg Aroclor-1254, 11,000 μg/kg benzo(a)pyrene, and 4,000 μg/kg dibenz(a,h)anthracene. The maximum concentrations in subsurface soil or

subsurface sediment were 290,000 µg/kg Aroclor-1254 and 72,000 µg/kg benzo(a)pyrene. Arsenic was detected at one location at a concentration of 26 mg/kg. All other analytes, including radionuclides, were less than RFCA WRW soil ALs (DOE et al. 2003).

A RFCA (DOE et al. 1996) accelerated action was implemented at PAC 700-1108 in accordance with ER RSOP Notification #04-10 (DOE 2004b), which was approved by CDPHE on July 9, 2004 (CDPHE 2004). Accelerated action activities were conducted between May 24, 2004, and November 10, 2004. Soil and sediment were removed from the four affected areas discussed above. Approximately 376 cy of sediment and soil were excavated from the drainage area into Bowman's Pond, Bowman's Pond itself, and a small area (90 ft^2) 40 ft east of Bowman's Pond. Excavation history and boundaries are presented in the Closeout Report for IHSS Group 700-11 (DOE 2005). Forty-four confirmation samples were collected. Aroclor-1254 concentrations in the confirmation samples ranged from below the RL to 12,000 µg/kg. All were less than the RFCA WRW soil AL of 12,400 µg/kg (DOE et al. 2003). Radionuclides were sporadically detected in confirmation samples at activities exceeding background levels. Maximum detected activities of radionuclides in confirmation samples were as follows: americium-241, 0.583 pCi/g; plutonium-239/240, 3.321 pCi/g; uranium-234, 6.306 pCi/g; uranium-235, 0.452 pCi/g; and uranium-238, 6.306 pCi/g (DOE 2005). All contaminant activities and concentrations at the final confirmation sampling locations were less than RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

After four rounds of excavations and associated confirmation sampling events, all residual contaminant concentrations were less than RFCA WRW soil ALs (DOE et al. 2003). An SSRS performed for residual contamination in IHSS Group 700-11 did not indicated that residual contamination at the site would migrate into surface water causing an exceedance of surface water quality standards. In accordance with RFCA (DOE et al. 1996), NFAA status was recommended for PAC 700-1108 in the Closeout Report for IHSS Group 700-11 (DOE 2005), based on the confirmation sampling and the SSRS.

After review of the Closeout Report for IHSS Group 700-11 (DOE 2005) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 700-1108 on February 4, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2004, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #04-10, IHSS Group 700-11, Approval Letter, July 9.

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Approval, Draft Closeout Report, IHSS Group 700-11, PAC 700-1108 – Bowman's Pond and IHSS 139(N)(a) – Steam Condensate Tanks, February.

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

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

DOE, 1994, Draft Final Investigations of Foundation Drains and Other Data Compilation, Addendum to the Operable Unit 8 Work Plan, 700 Area, Technical Memorandum No. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 1999a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999b, Sampling Analysis Plan Site Characterization of Bowman's Pond (PAC 700-1108) and Steam Condensate Holding Tanks (IHSS 139.1N), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004a, Industrial Area Sampling and Analysis Plan Addendum #IA-04-10, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2004b, Environmental Restoration RFCA Standard Operating Protocol Notification #04-10, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005, Closeout Report for IHSS Group 700-11, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

K-H, 2001, Trip Notes from COE Site Visit 11/20/01 (e-mail communication), Rocky Flats Environmental Technology Site, Golden, Colorado, November.

PAC REFERENCE NUMBER: 700-1109

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Uranium Incident – Building 778

This Final Update to the HRR for PAC 700-1109 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1109 is summarized in this update. The following HRR volumes contain PAC 700-1109 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

June 2, 1988

Historical Summary

The location of PAC 700-1109 is shown on Figure 21. A depleted uranium disk, one inch diameter and 0.5 inch thick, was found on the ground near a dumpster between Buildings 778 and 729.

PAC Investigations

The piece of uranium was transported to Building 776 where it was determined to be depleted uranium. It was then transported to a Building 779 Nuclear Material Control custodian where it was stored in a 55-gallon drum. The site where the uranium was found was surveyed and found to have counts within the background level. No documentation was found that further details response to this occurrence.

No Further Action Recommendation

PAC 700-1109 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified. An NFA for PAC 700-1109 was verbally agreed to in the November 14, 2001, meeting and was formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, and T. Rehder, EPA, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 700-1110

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Nickel Carbonyl Burial West of Building 771

This Final Update to the HRR for PAC 700-1110 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1110 is summarized in this update. The following HRR volumes contain PAC 700-1110 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

September 11, 1957

Historical Summary

The location of PAC 700-1110 is shown on Figure 21. On September 11, 1957, a fire occurred in Building 771. The fire spread to the glovebox exhaust booster filters and the main filter plenum. Cylinders of nickel carbonyl were stored in the anteroom outside the exhaust filter plenum room of Building 771 at the time of the fire. During the fire, seven nickel carbonyl cylinders were moved from the anteroom to a storage position in the Pipe Shop area. Fourteen nickel carbonyl cylinders were found in the exhaust filter plenum room approximately 20 ft from the western end of the plenum. Several of these cylinders were found burning around the top. The burning cylinders were sprayed with water. The cylinders were loaded into four 55-gallon drums and one GI can. Four cylinders were placed in each drum and the drums were filled with vermiculite and water. The barrels were taken to the access shaft and lifted out with a crane. A burial pit was excavated north of the access shaft and the drums were lifted from the access shaft to the burial pit. Six cylinders were moved directly to the burial pit (DOE 1992).

Four 55-gallon drums, one GI can with two cylinders, and six loose cylinders of nickel carbonyl were removed from the burial pit west of Building 771 to a pit east of the SEP (PAC 000-101) (PIC 41). Explosive charges were used to destructively vent the cylinders and ignite any residual gas. No documentation was found that further detailed the fate of the constituents released to the environment (DOE 1992).

PAC Investigations

No additional investigation was required because the nickel carbonyl cylinders and gas were destroyed.

No Further Action Recommendation

PAC 700-1110 was addressed through the consultative process in NFA Working Group meetings on November 14, 2001, March 13, 2002, and April 3, 2002. Based on these discussions and additional information provided by DOE, agreement was reached that an NFA was justified. An NFA for PAC 700-1110 was verbally agreed to in the April 3, 2002, meeting and was formally approved by CDPHE (the LRA) and EPA in a letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, and T. Rehder, EPA, RE: Approval of NFA designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 700-1111

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Leaking Transformer – Building 750

This Final Update to the HRR for PAC 700-1111 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1111 is summarized in this update. The following HRR volumes contain PAC 700-1111 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Prior to 1987

Historical Summary

The location of PAC 700-1111 is shown on Figure 21. Transformer 750-1 was located on the northeastern side of Building 750, approximately 80 ft from a cafeteria entrance. In August 1985, Transformer 750-1 was reported as a potential PCB risk. The exposure risk was related to a small crack in the berm surrounding the transformer, and the proximity of the transformer to the cafeteria entrance. According to interviews with utility personnel, prior to 1987 this transformer leaked dielectric fluid containing PCBs (DOE 1992).

It was reported that Transformer 750-1 contained 465 gallons of PCB fluid weighing 2,533 kg. In October 1985, it was reported that Transformer 750-1 contained PCB fluid exclusively.

In August 1985, it was recommended that the concrete berm surrounding the transformer be sealed. In January 1986, it was anticipated that Transformer 750-1 would be removed and replaced under the FY1986 Environmental Hazards Elimination Project. In 1987, the transformer was retrofilled and relocated on a new concrete pad several feet east of its previous location (DOE 1992). The transformer was removed during the D&D of Building 750, which was completed on August 28, 2004.

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs (DOE 1991) conducted in July 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The highest PCB concentration was detected in a soil sample collected adjacent to the old concrete transformer pads (160 ppm) (DOE 1995).

Under the approved Final PAM for Remediation of PCBs (DOE 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil

samples were analyzed using EPA Method 4020 and concrete samples were analyzed using EPA Method 8080.

In accordance with the PAM (DOE 1995), approximately 26 cy of PCB-contaminated soil were excavated, containerized, and shipped offsite for disposal (DOE 1997). Cleanup verification analytical results for PCBs in the soil were less than 10 ppm using EPA Method 4020, and less than 5.9 ppm using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the EPA Method 4020 (Immunoassay Field Technique) analytical results. There were no detections of PCBs on the concrete transformer pad using EPA Method 8080 (DOE 1996).

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

In accordance with RFCA (DOE et al. 1996), NFAA was recommended as appropriate for PAC 700-1111 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c), based on the site remediation and confirmation data, and the White Paper findings noted above.

After review of the NFAA justification by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 700-1111 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), Colorado, May 6.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE, 1997, Closeout Report for the Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1112

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Leaking Transformer – Building 776-5

This Final Update to the HRR for PAC 700-1112 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1112 is summarized in this update. The following HRR volumes contain PAC 700-1112 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

June 1986 to August 1989

Historical Summary

The location of PAC 700-1112 is shown on Figure 21. Transformer 776-5 was located west of Building 714 within the PA. The 1500 KVA transformer was manufactured in 1969 and was reported as leaking coolant oil in June 1986 (DOE 1992). This transformer was retrofilled in 1986. The 308 gallons of dielectric fluid in Transformer 776-5 contained 807 ppm PCBs at one point prior to 1989 (DOE 1992). Transformer 776-5 was scheduled for cleanup on August 12, 1989. No documentation could be found to verify what cleanup was performed at this site if any.

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991 (DOE 1991), soil samples were collected in accordance with approved EPA sampling protocols and analyzed for PCBs using EPA Method 8080 (DOE 1995). The highest PCB detection in soil samples collected adjacent to the concrete transformer pad was 0.088 ppm (DOE 1996). Remediation was not conducted at this transformer; however, the transformer was removed as part of D&D activities, which were completed at Building 776 on June 17, 2005.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup

of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

In accordance with RFCA (DOE et al. 1996), an NFAA was recommended for PAC 700-1112 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c), based on the site data and White Paper findings noted above. After review of the NFAA justification by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 700-1112 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1113

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Water Released from the SEP Pond 207-C

This Final Update to the HRR for PAC 700-1113 consolidates the information in the Eleventh Quarterly HRR Update and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1113 is summarized in this update. The following HRR volumes contain PAC 700-1113 information:

Original Report – Eleventh Quarterly (DOE 1995); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

February 2, 1995

Historical Summary

The location of PAC 700-1113 is shown on Figure 21. On February 2, 1995, Plant personnel proceeded to pump snowmelt and rinse water that had accumulated in SEP Pond 207-C (PAC 000-101) to Building 374 for treatment after the pond had been emptied of contaminated sludge and water. Between 9:30 A.M. and 10:00 A.M. immediately after starting the small pump, a pinhole-sized leak was noticed in the pressurized hose. By the time the worker could turn off the pump (approximately 6 seconds later) the pinhole had expanded to approximately 2 cms. The release occurred at the southeastern corner of the pond in a radiologically controlled area (RCA). An estimated 5 gallons of low-level mixed wastewater were released back into the pond and on to soil across a bermed area outside of the pond. Several workers were sprayed during the release from the pressurized hose (DOE 1995).

The water released from this occurrence consisted of snowmelt and rinse water that had accumulated in the pond. The rinse water was used during the Phase 1 environmental remediation plan to empty the SEP and prepare the pond liner for a coating process. The SEP was previously used to hold RCRA-regulated hazardous waste that included listed hazardous wastes from nonspecific sources, such as spent halogenated solvents and electroplating waste. Pond 207-C also received radioactive waste from process waste lines. Samples of the liquid remaining in the pond were collected on February 2 and 3, 1995, to determine the level of hazardous waste constituents present. Based on historical usage of the pond, the following EPA waste codes were assigned to the pond water: F001, F002, F003, F005, F006, F007, F009, and F039 (DOE 1995).

The liquid released to the pond and the liquid remaining in the hose was drained back into the sump area located in the northeast corner of the pond. On February 6, 1995, the water was pumped to Building 374 for treatment. No radioactive contamination was detected on the

workers when they were monitored. The area of wetted soil on the southeastern berm was visually inspected and estimated to be 1.5 by 4 ft in size. Approximately 15 lbs of soil was removed from the wetted area on February 2, 1995, and managed as LLM waste. Samples of the liquid remaining in the pond were collected that afternoon and again on February 3, 1995, to determine the level of hazardous waste constituents present. Operations personnel removed the hose from service and replaced it with a new hose on February 3, 1995 (DOE 1995).

PAC Investigations

No further investigation was required because the soil was removed.

No Further Action Recommendation

PAC 700-1113 was addressed through the consultative process in an NFA Working Group meeting on March 13, 2002. Based on these discussions, agreement was reached that an NFA was justified. An NFA for PAC 700-1113 was verbally agreed to in the March 13, 2002, meeting and was formally approved by CDPHE (the LRA) and EPA in a letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, and T. Rehder, EPA, RE: Approval of NFA designation for IHSSs, PACs, and PICs, September 26.

DOE, 1995, Eleventh Quarterly Update for Historical Release Report, January 1, 1995 to March 31, 1995, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBERS: 700-1114a and 700-1114b

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Releases During Liquid Transfer Operations from B774

This Final Update to the HRR for PACs 700-1114a and 700-1114b consolidates the information in the 1997 HRR and subsequent HRR updates with information gained through the disposition of these PACs in accordance with the RFCA accelerated action process. The dispositions of PACs 700-1114a and 700-1114b are summarized in this update. The following HRR volumes contain PACs 700-1114a and 700-1114b information:

Original Report – 1997 Annual (DOE 1997); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

October 10 and 11, 1996

Historical Summary

The locations of PACs 700-1114a and 700-1114b are shown on Figure 21. On October 10 and 11, 1996, transfer of liquid mixed-waste PCB-containing oils from Building 774 to a tanker truck resulted in reportable/incidental releases at two separate locations. The first incident was identified when the tanker was temporarily staged west of Building 765 near the Portal 1 entrance (PAC 700-1114b). Personnel observed liquid dripping from the vacuum pump apparatus through the exhaust/demister unit onto the pavement. After responding to the incident at Building 765, workers involved in the liquid transfer operation immediately walked down the area near Building 774 where the pumping operation had taken place earlier. Approximately the same amount of liquid was released to soil at that location (PAC 700-1114a). The liquid was condensate from the vacuum pump apparatus. It was estimated that approximately 1 cup of liquid was released at each location (DOE 1996).

Laboratory analyses of the liquid indicated that both F001 and F002 waste codes were applicable and, therefore, waste generated during cleanup was identified as hazardous. Analysis for PCBs indicated less than 2 ppm PCBs. The following compounds were positively identified: trichloroethene (250 ppm), methylene chloride (33 ppm), and 1,1,1-trichloroethane (930 ppm). No radioactivity was identified (DOE 1996).

After the first two incidents on October 10, 1996, a plastic bag was placed under and around the exhaust condensate line to collect any residual release. Site personnel performed a thorough cleanup of the liquid using rags (for the asphalt surfaces) and partially filled one 55-gallon drum with soil contaminated by the October 11, 1996 release. The release was categorized and reported as an “incidental release,” in accordance with 29 CFR 1910.120, Incidental Response.

A third release to the soil occurred at the Building 774 (PAC 700-1114a) location the following day (October 11, 1996) involving approximately 1 gallon of the same type of liquid. The release

was due to the failure of a plastic bag affixed under the exhaust condensate line after the previous day's experience with the apparatus (DOE 1996).

All associated wastes were containerized and managed in accordance with Site requirements. The releases (at both locations) were reported in the 1997 Annual Update to the HRR as PACs 700-1114a and 700-1114b for the Building 774 location and the Building 765 location respectively (see Comments below).

PAC Investigations

No further investigation was required.

No Further Action Recommendation

PACs 700-1114a and 700-1114b were addressed through the consultative process in an NFA Working Group meeting on February 27, 2002. Based on these discussions, agreement was reached that an NFA was justified. An NFA for PACs 700-1114a and 700-1114b was verbally agreed to in the November 14, 2001, meeting and was formally approved by CDPHE (the LRA) and EPA in a letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

During the NFA Status meeting on February 27, 2002, it was agreed that the narrative for PACs 700-1114a and 700-1114b in the 2002 Annual Update for the HRR (DOE 2002) would be rewritten to clarify where and how the specific locations occurred and how they are numbered (that is, 1114a and 1114b). Although the 1997 HRR Annual Update, Plate 2, shows where the specific incidents occurred and properly assigned the PAC numbers, the text narrative did not specify the separate location numbers.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, and T. Rehder, EPA, RE: Approval of NFA designation for IHSSs, PACs, and PICs, September 26.

DOE, 1996, Occurrence Report (RFO-KHLL-LIQWASTE-1996-0004), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 700-1115

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-1
Unit Name:	Identification of Diesel Fuel in Subsurface Soil

This Final Update to the HRR for PAC 700-1115 consolidates the information in the 1997 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1115 is summarized in this update. The following HRR volumes contain PAC 700-1115 information:

Original Report – 1997 Annual (DOE 1997); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Discovered May 31, 1997

Historical Summary

The location of PAC 700-1115 is shown on Figure 21. PAC 700-1115 is a subsurface diesel fuel spill of unknown origin that was discovered near the northeastern corner of Building 708. On May 31, 1997, diesel fuel was observed in the soil dug from a 2-ft-deep trench (DOE 1997). Soil samples were collected from the trench and analyzed for BTEX, and TRPH. None of the BTEX constituents were detected at concentrations greater than RFCA Tier II subsurface soil ALs (DOE 1997, DOE et al. 1996). TRPH was detected at a concentration of 2,435.9 ppm, less than one-half of the 5,000 ppm cleanup threshold outlined in the RFCA Attachment 13, UST Closure Letter Agreement (DOE et al. 1996).

PAC Investigations

Accelerated action activities were conducted at IHSS Group 700-1 (PAC 700-1115) to characterize the nature and extent of contamination in soil. Characterization activities were conducted in accordance with IASAP Addendum #IA-04-15 (DOE 2004b). A total of 12 surface and subsurface soil samples were collected at six locations: five along the storm sewer line located in PAC 700-1115, and one in the center of the PAC. VOCs were identified as PCOCs for this PAC. No VOCs were detected at any of the sampling locations. Accelerated action characterization activities at PAC 700-1115 are discussed in detail in the Data Summary Report for IHSS Group 700-1 (DOE 2004c).

No Further Action Recommendation

NFAA was recommended for PAC 700-1115 in the Data Summary Report for IHSS Group 700-1 (DOE 2004c) based on the following:

- PCOCs 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 IHSS Group 700-1 is not located in an area prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because COCs were not detected in soil at any of the sampling locations for IHSS Group 700-1.

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 700-1115 on September 14, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Approval, Draft Data Summary Report for IHSS Group 700-1 PAC 700-1115 – Identification of Diesel Fuel in Subsurface Soil, dated August 2004, September 14.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Industrial Area Sampling and Analysis Plan Addendum #IA-04-15, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2004c, Data Summary Report for IHSS Group 700-1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 700-1116

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-3
Unit Name:	Transformer Leak South of Building 776

This Final Update to the HRR for PAC 700-1116 consolidates the information in the 1998 Annual Update to the HRR with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1116 is summarized in this update. The following HRR volume contains PAC 700-1116 information:

Original Report – 1998 Annual (DOE 1998).

Dates(s) of Operation or Occurrence

1957 to 1998

Historical Summary

The location of PAC 700-1116 is shown on Figure 21. On January 19, 1998, while conducting a surveillance audit in the 700 Building area, it was discovered that Transformer T-776-2 was leaking small amounts of dielectric fluid from a weep hole near the bushing/seal area. Additionally, staining of the concrete transformer pad and some of the adjacent rock/soil surrounding the pad was observed. It is not known how long the transformer had been leaking, and it was estimated that approximately 2 gallons were released. The oil leak was reportedly repaired on March 30, 1998 (DOE 1998).

The transformer went into service in April 1957 and was located within PAC 700-150.7. It is unclear whether the transformer underwent retrofilling in the late 1980s or at what other locations the transformer was used. The dielectric oil sampled contained Aroclor-1260 at 21 and 23 ppm. Documents reviewed do not reference the analytical method used, or whether leaks were detected or the soil was sampled. It is believed that the transformer and stained soil were inadvertently excluded from the Preliminary Assessment/Site Assessment of PCBs Site study (DOE 1998). Transformer 776-2 was removed during D&D of the 700 Area.

PAC Investigations

Surface and subsurface soil samples were collected from two locations situated north and east of the transformer, and were analyzed for radionuclides, metals, VOCs, and PCBs in accordance with IASAP Addendum #IA-03-04 (DOE 2003). Aroclor-1260 was estimated below the detection limit in one subsurface soil sample at a concentration of 14 µg/kg. No other Aroclors were detected in any of the samples. The maximum detected activities of americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238 were 0.993, 5.662, 2.296, 0.171, and 2.417 pCi/g, respectively. All contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2005, DOE et al. 2003).

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW soil AL of 12.4 ppm, adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

In accordance with RFCA (DOE et al. 1996), NFAA status was recommended for PAC 700-1116 in the Closeout Report for IHSS Group 700-3, Volume I (DOE 2005), based on the site data and White Paper findings noted above.

After review of the White Paper and the Closeout Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 700-1116 on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S.H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3, Volume I, April 19.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Dioxin-Like Compounds in Transformer Oil: An Evaluation of Their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2005, Closeout Report for IHSS Group 700-3, Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 700-1117

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Building 701 Water Line Soil Put-back

This Final Update to the HRR for PAC 700-1117 consolidates the information in the 1998 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 700-1117 is summarized in this update. The following HRR volumes contain PAC 700-1117 information:

Original Report – 1998 Annual (DOE 1998a); and
Update Report – 1999 Annual (DOE 1999).

Dates(s) of Operation or Occurrence

October 9, 1997

Historical Summary

The location of PAC 700-1117 is shown on Figure 21. On October 9, 1997, Building 776 management reported that water was surfacing at an area immediately south of Building 701. Upon further investigation, it was suspected that the Building 776 cooling tower return line was the source of the water and a work order was submitted for excavation and repair. The line was located and repaired; however, due to the urgency of the work, sampling for the required RCRA hazardous waste determination was done after the excavation spoils were generated. In the interim, the spoils (approximately 5 cy) were protected from the elements utilizing heavy plastic with bermed containment and a tarp cover (DOE 1998a).

PAC Investigations

An environmental assessment was conducted as part of the Soil Disturbance Permit and sampling was required because of the close proximity of the occurrence to PACs 700-118.1, 000-121, and 700-131. Work to repair the line proceeded on December 17, 1997, and the line was repaired several days later.

Samples were collected at 10 sampling locations in January 1998 and analyzed for VOCs, metals, and radionuclides. Upon receipt of the analytical data in February 1998, the excavation spoils were held outside the excavation because 100 ppb of carbon tetrachloride was detected in one sample. This decision was consistent with Plant practice under existing Site procedures for non-RFCA-related construction/maintenance activities.

There were no metals detected above background in any of the samples; however, plutonium-239/240 was detected at 10.4 pCi/g and americium-241 at 2.29 pCi/g. Both isotopic results were above background levels and were likely attributable to the 1969 fire associated with Building 776 (DOE 1992).

Because of the low detection of carbon tetrachloride and permissible put-back levels approved for RFCA environmental projects (230 ppb), it was decided to seek approval from the regulatory agencies for site-specific soil put-back at this location (DOE 1998b). Approval from the regulatory agencies to replace the spoils into the excavation was granted on July 8, 1998 (CDPHE 1998). The excavation was backfilled on August 12, 1998 (DOE 1998a).

No Further Action Recommendation

After consultation, CDPHE agreed that the soil (contaminated environmental media) could be managed as nonhazardous waste and replaced into the excavation if concentrations were below values in Table 1, Soil Cleanup Table Value Standards for Residential/Unrestricted Land Use in CDPHE's Soil Remediation Objectives Policy (CDPHE 1997). The carbon tetrachloride standard is 230 ppb.

DOE granted permission on July 8, 1998, to apply the values in the Soil Cleanup Table Value Standards from the CDPHE's Soil Remediation Objectives to the soils generated from the specific project (DOE 1998b). In addition, it was agreed that the RFCA Tier II soil ALs could be applied as put-back levels for the plutonium-239/240 and americium-241 (DOE et al. 1996). Based on these agreements, the spoils were returned to the site on August 12, 1998, and NFA was justified for PAC 700-1117.

After review of the 1998 Annual Update to the HRR (DOE 1998a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFA status for PAC 700-1117 on July 9, 1999 (CDPHE 1999).

Comments

Carbon tetrachloride releases are known to have occurred in this area (see IHSS 118.1). It has not been determined whether this occurrence is related.

Analytical data for samples collected in January 1998 show carbon tetrachloride at 100 ppb and chloroform at 63 ppb from one sampling location. Chloroform is commonly detected in this range due to the addition of chlorine for domestic water use.

References

CDPHE, 1997, CDPHE Proposed Soil Remediation Objectives Policy Document, Rocky Flats Environmental Technology Site, Golden, Colorado, December 31.

CDPHE, 1998, Excavated Soils Adjacent to Building 701 (cc mail from C. Spreng to L. Brooks), July.

CDPHE, 1999, Correspondence to J. Legare, DOE RFFO, from S.H. Gunderson, CDPHE, RE: Annual Update for the Historical Release Report (September 1998), July 9.

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

DOE, 1998b, Request to Apply Soil Cleanup Table Value Standards in CDPHE Soil Remediation Objectives to Building 701 Spoils, 98-DOE-03757, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

800 AREA

Figure 22
HRR 800 Area IHSSs and PACs

PAC REFERENCE NUMBER: 800-102

IHSS Number: 102

Current Operable Unit: 1

Former Operable Unit: 1

IHSS Group: Not Applicable

Unit Name: Oil Sludge Pit

This Final Update to the HRR for PAC 800-102 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 102 is summarized in this update. The following HRR volumes contain IHSS 102 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

1955 to 1963

Historical Summary

In 1958, 30 to 50 drums of nonradioactive materials were dumped in a pit south of Building 881. As shown on Figure 22, IHSS 102 is approximately 475 ft south of Building 881 with dimensions of 40 ft by 70 ft. The sludge pit was visible in a 1955 aerial photograph and appears to be closed in a 1963 photograph (DOE 1994). The pit was filled with material consisting of oil sludge from tank cleanouts. It is not known if one tank was involved or several, although one of the tanks involved may have stored No. 6 fuel oil. It is possible that the tanks were the USTs discussed in PACs 800-105.1 and 800-105.2.

IHSS Investigations

IHSS 102 was studied in accordance with the Final Phase III OU1 RFI/RI Work Plan (DOE 1991). The Final Phase III RFI/RI Report for OU 1 was issued in 1994 (DOE 1994). Eight boreholes were drilled adjacent to and downgradient of IHSS 102. The only VOCs detected were trichloroethene at 3 μg/kg and toluene at 270 μg/kg. The only SVOCs detected were naphthalene, phenanthrene, and pyrene with concentrations estimated below the detection limit. Radionuclide activities were very low with a maximum detected plutonium-239/240 activity of 0.024 pCi/g and a maximum detected americium-241 activity of 0.023 pCi/g. The report concluded that the nature and distribution of detected analyte concentrations at IHSS 102 was indicative of background.

No Further Action Recommendation

Based on the low levels of contamination in IHSS 102 and correspondingly low risk, IHSS 102 was approved for NFA by the regulatory agencies as documented in the CAD/ROD Declaration for OU 1, 881 Hillside Area (DOE 1997b).

Comments

IHSS 102, while part of OU 1, is geographically in the BZ OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

OU 1 CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to ensure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU 1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

DOE, 1991, Final Phase III RFI/RI Work Plan 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, March.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-103

IHSS Number: 103

Current Operable Unit: 1

Former Operable Unit: 1

IHSS Group: Not Applicable

Unit Name: Chemical Burial

This Final Update to the HRR for PAC 800-103 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 103 is summarized in this update. The following HRR volumes contain IHSS 103 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

Unknown

Historical Summary

IHSS 103 is an area south of Building 881 that was reportedly used to bury unknown chemicals. Based on 1963 aerial photographs, the area is described in the CEARP as a circular pit located approximately 150 ft southeast of Building 881, approximately 50 ft in diameter, and apparently filled with liquid. The location of IHSS 103 is shown on Figure 22.

IHSS Investigations

IHSS 103 was studied in accordance with the Final Phase III OU1 RFI/RI Work Plan (DOE 1991). The Final Phase III RFI/RI Report for OU 1 was issued in 1994 (DOE 1994). Five boreholes were drilled and sampled in and adjacent to IHSS 103. Of these, one was drilled within the approximate boundary of the IHSS, one downslope, and three upslope. Subsurface soil samples were analyzed for VOCs, SVOCs, and radionuclides. The only VOCs detected were trichloroethene and tetrachloroethene at 12 μg/kg each, and toluene at 150 μg/kg. The only SVOCs detected were fluoranthene, phenanthrene, and pyrene at concentrations near the detection limit. Plutonium-239/240 was detected at a maximum activity of 0.062 pCi/g and americium-241 was not detected at levels exceeding background (DOE 1994).

No Further Action Recommendation

Based on low level of contamination in IHSS 103 and correspondingly low risk, IHSS 103 was approved for NFA by the regulatory agencies as documented in the CAD/ROD Declaration for OU 1, 881 Hillside Area (DOE 1997b).

Comments

No documentation was found that verifies the existence of the site. Personnel who were employed by Rocky Flats during the time frame related to this site were interviewed. They could

not recall any incidents of dumping close to Building 881. It is possible that previous reports may have confused this site with Trench T-2, which is farther east (PAC 900-109). Trench T-2 is believed to have been used for the dumping of liquid chemicals.

IHSS 103, while part of OU 1, is geographically in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

OU 1 CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to assure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU 1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

DOE, 1991, Final Phase III RFI/RI Work Plan 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, March.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-104

IHSS Number: 104

Current Operable Unit: 1

Former Operable Unit: 1

IHSS Group: Not Applicable

Unit Name: Liquid Dumping

This Final Update to the HRR for PAC 800-104 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 104 is summarized in this update. The following HRR volumes contain IHSS 104 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

Prior to 1969

Historical Summary

The CEARP Phase 1 Report indicated that an area east of Building 881 was used for disposal of unknown liquids and drums. The location of IHSS 104 is shown on Figure 22.

IHSS Investigations

IHSS 104 was studied in accordance with the Final Phase III OU1 RFI/RI Work Plan (DOE 1991), and results were reported in the Final Phase III RFI/RI Report for OU 1 (DOE 1994). One borehole was drilled within the boundaries of IHSS 104. Plutonium-239/240 was detected at a maximum activity of 0.0315 pCi/g. Toluene was the only VOC detected, with a maximum concentration of 150 µg/kg. Several PAHs were detected at concentrations similar to the detection limits. Based on these results, the investigation concluded that IHSS 104 was not a source of radionuclide contamination (DOE 1994).

No Further Action Recommendation

Based on low amounts of contamination in IHSS 104 and correspondingly low levels of risk, IHSS 104 was approved for NFA by the regulatory agencies as documented in the CAD/ROD Declaration for OU 1, 881 Hillside Area (DOE 1997b).

Comments

No documentation was found that verifies the existence of the site. Personnel employed by Rocky Flats during this time could not recall any incidents of dumping close to Building 881. It is possible that previous reports may have confused this site with Trench T-2 farther east (PAC 900-109). Trench T-2 is believed to have been used for the dumping of liquid chemicals (DOE 1992). Results of the Phase III RFI/RI suggest that waste disposal at IHSS 104 did not occur or cause subsurface contamination (DOE 1994).

IHSS 104, while part of OU 1, is geographically in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

OU 1 CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to assure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU 1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

DOE, 1991, Final Phase III RFI/RI Work Plan 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, March.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-105.1 and 800-105.2

IHSS Number: 105.1 and 105.2

Current Operable Unit: 1

Former Operable Unit: 1

IHSS Group: Not Applicable

Unit Name: Building 881 East and West Out-of-Service Fuel Tanks

This Final Update to the HRR for PACs 800-105.1 and 800-105.2 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of IHSSs 105.1 and 105.2 is summarized in this update. The following HRR volumes contain IHSS 105.1 and 105.2 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

1958 to 1976

Historical Summary

Interviewees for the CEARP Phase 1 document mentioned that asbestos was placed in two underground, out-of-service diesel fuel tanks located south of Building 881. The tanks were later filled with concrete (DOE 1992). The locations for IHSSs 105.1 and 105.2 are shown on Figure 22.

IHSS Investigations

IHSSs 150.1 and 150.2 were studied in accordance with the Final Phase III OU1 RFI/RI Work Plan (DOE 1991). Six boreholes were drilled in the vicinity of IHSSs 105.1, 105.2, 106, 107, and 145. Trichloroethene was detected once in a borehole near IHSSs 105.1 and 105.2 at a concentration estimated below the detection limit. Americium-241 was detected at 0.10 pCi/g, plutonium-239/240 ranged from 0.0197 to 0.05 pCi/g, and uranium-238 ranged from 1.01 to 1.4 pCi/g (DOE 1994).

No Further Action Recommendation

Based on the low contaminant concentrations in IHSSs 150.1 and 150.2 and correspondingly low risk, IHSSs 150.1 and 150.2 were approved for NFA by the regulatory agencies as documented in the CAD/ROD Declaration for OU 1, 881 Hillside Area (DOE 1997b).

Comments

IHSSs 105.1 and 105.2, while part of OU 1, are geographically in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

OU 1 CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to assure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU 1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

DOE, 1991, Final Phase III RFI/RI Work Plan 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, March.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-106

IHSS Number:	106
Current Operable Unit:	1
Former Operable Unit:	1
IHSS Group:	Not Applicable
Unit Name:	Building 881, Outfall

This Final Update to the HRR for PAC 800-106 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 106 is summarized in this update. The following HRR volumes contain IHSS 106 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

Early 1950s to December 1977 (Date of last documented discharge)

Historical Summary

In the 1950s and 1960s, the intermittent discharging of untreated sanitary waste took place in an area south of Building 881. The location of IHSS 106 is shown on Figure 22. Although this practice was halted, the outfall continued to be used for discharges of cooling water blowdown into the late 1970s. The outfall was originally described as a 6-inch-diameter vitrified clay pipe; however, a site visit conducted on November 21, 1991, revealed that the pipe was made of iron. The pipe originated from Building 887 and was the cleanout pipe for an overflow line from the Building 881 cooling tower. Effluent was found discharging from this outfall onto the hillside on December 22, 1977. No liquid was discharging from the pipe in 1991 (DOE 1992).

Discharges occurring in the 1950s consisted of untreated sewage and any other waste that may have entered the sanitary system of Building 881. It is uncertain when these discharges began or ended. In 1955, sampling indicated the presence of high bacteria counts in Woman Creek below Building 881 east to the cattle fence. Radioactivity was not found above background levels. Sampling at the outfall in 1971 (known at that time as the sewage lift station) indicated activities of 1.05 and 0.30 dpm/g (DOE 1992).

The Draft RI Report for High-Priority Sites (881 Hillside Area) (DOE 1987) indicated there was a small pond below the outfall. (No pond was present in 1991.) A sample collected from the pond on May 26, 1987, indicated plutonium and americium levels of 0.69 and 0.18 pCi/L, respectively. No other hazardous substances were found in the sample (DOE 1992).

Concern was raised about the outfall because the discharge was allowed to enter Woman Creek. Several small retention ponds were built in 1955 (PACs SE-1600, SE-1601.1, and SE-1601.2), and an interceptor ditch was built in 1979 which carried the outfall water to Pond C-2 (PAC SE-142.11). Surface water samples were collected at all of these locations in addition to groundwater samples from monitoring wells in the vicinity (DOE 1992).

IHSS Investigations

IHSS 106 was studied in accordance with the Phase III OU 1 RFI/RI Work Plan (DOE 1991). Six boreholes were drilled in the vicinity of IHSSs 106, 105.1/105.2, 107, and 145. Sampling results were summarized in the Final Phase III RFI/RI Report for OU 1 (DOE 1994). Americium-241 was detected at a maximum activity of 0.84 pCi/g, plutonium-239/240 at 0.10 pCi/g, uranium-233/234 at 1.04 pCi/g, and uranium-238 at 1.188 pCi/g. Trichloroethene was detected at a maximum concentration of 120 μg/kg and tetrachloroethene was detected at a maximum concentration of 190 μg/kg.

No Further Action Recommendation

Based on the low concentrations of contaminants at IHSS 106 and the correspondingly low risk associated with the contamination, IHSS 106 was approved for NFA by the regulatory agencies as documented in the CAD/ROD Declaration for OU 1, 881 Hillside Area (DOE 1997b).

Comments

IHSS 106, while part of OU 1, is geographically in the BZ OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

OU 1 CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to assure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU 1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

DOE, 1987, Draft Remedial Investigation Report for High Priority Sites (881 Hillside Area), Rocky Flats Plant, Golden, Colorado, July.

DOE, 1991, Final Phase III RFI/RI Work Plan 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, March.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-107

IHSS Number: 107

Current Operable Unit: 1

Former Operable Unit: 1

IHSS Group: Not Applicable

Unit Name: Building 881 Hillside Oil Leak

This Final Update to the HRR for PAC 800-107 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 107 is summarized in this update. The following HRR volumes contain IHSS 107 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

1973

Historical Summary

On May 29, 1973, oil was discovered flowing from the slope south of Building 881. An investigation was initiated to discover the source of and stop the flow of oil to Woman Creek. Oil was also found in a 60-inch-diameter standpipe that was located just south of the security fence. The water on which the oil was floating was traced back to an outfall culvert 300 ft south of the security fence which was later found to be the footing drain from Building 881 (DOE 1992). The location of IHSS 107 is shown on Figure 22. The oil was soaked up with straw that was later deposited in the Present Landfill (PAC NW-114).

It was first thought that the oil was coming from leaks in two diesel fuel storage tanks (IHSS 105.1 and IHSS 105.2) because the footing drain passed directly under the tanks. The tanks and lines were tested and no leaks were detected. The pipes that carried the oil from the tanks to the building's furnace lay within a concrete-lined trench that had a drain hole in it. It was postulated that oil spills occurred during the filling of the tanks and flowed out the drain hole into the underlying gravel. After 20 years of use an underground reservoir of waste oil developed to the extent that it started seeping out of the hillside (DOE 1992). The tanks were in use from 1958 through 1976. After 1976, they were filled with ACM and then later with concrete (DOE 1994).

Another theory is that the oil may have originated from the oil sludge pit that is also located in this area (PAC 800-102). Groundwater data indicated the presence of VOCs in monitoring wells along the hillside. There have also been known releases and burial along this hillside including plutonium-contaminated soil, multiple solvent spills, and other unknown chemicals (DOE 1992).

A concrete "skimming pond" was constructed to contain the oil flowing from the footing drain and an interceptor ditch was constructed to prevent the water from reaching Woman Creek. The Phase III RI/RFI Report for OU 1 (DOE 1994) indicated the skimming pond was removed during construction of the French drain. The French drain was installed to collect potentially

contaminated groundwater for treatment. Groundwater monitoring wells were installed to identify the extent of contamination.

The Draft RI Report for High Priority Sites (881 Hillside Area) (DOE 1987) indicated that elevated levels of tetrachloroethene (128 ppb) and trichloroethene (14 ppb) were found in water samples collected from the northern end of a skimming pond (DOE 1992). Wells to the west have indicated the presence of VOCs and radionuclides (DOE 1992).

IHSS Investigations

IHSS 107 was studied in accordance with the Final Phase III OU 1 RFI/RI Work Plan (DOE 1991). Sampling results were summarized in the Final Phase III RFI/RI Report for OU 1 (DOE 1994). Samples were collected from boreholes located within the skimming pond portion of IHSS 107. Plutonium-239/240 was detected at a maximum of 0.019 pCi/g, uranium-234 at 1.195 pCi/g, uranium-235 at 0.08 pCi/g, uranium-238 at 1.07 pCi/g, and toluene at 170 µg/kg.

No Further Action Recommendation

Based on the low contaminant concentrations in IHSS 107 and correspondingly low risk, IHSS 107 was approved for NFA by the regulatory agencies as documented in the CAD/ROD Declaration for OU 1, 881 Hillside Area (DOE 1997b).

Comments

IHSS 107, while part of OU 1, is geographically in the BZ OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

OU 1 CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to assure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU 1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

DOE, 1987, Draft Remedial Investigation Report for High Priority Sites (881 Hillside Area), Rocky Flats Plant, Golden, Colorado, July.

DOE, 1991, Final Phase III RFI/RI Work Plan 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, March.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-145

IHSS Number: 145

Current Operable Unit: 1

Former Operable Unit: 1

IHSS Group: Not Applicable

Unit Name: Sanitary Waste Line Leak

This Final Update to the HRR for PAC 800-145 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 145 is summarized in this update. The following HRR volumes contain IHSS 145 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

January 1981

Historical Summary

The location of IHSS 145 is shown on Figure 22. On January 21, 1981, the 6-inch sanitary sewer line that originated at the Building 887 lift station leaked on the hillside south of Building 881. The line had conveyed sanitary wastes and low-level radioactive laundry effluent to the sanitary treatment plant from approximately 1969 to 1973 (DOE 1992). A review of construction drawings for the 1992 HRR indicated the only sanitary waste lines located south of Building 881 are the 6-inch cast-iron sanitary sewer line that originated at the Building 887 lift station and a 6-inch vitrified clay pipe that runs east-west into Building 887.

The January 1981 leak was contained by an earthen dike to prevent drainage to the SID and Woman Creek. The waste line was repaired January 30, 1981 (DOE 1992).

IHSS Investigations

IHSS 145 was studied in accordance with the Final Phase III OU 1 RFI/RI Work Plan (DOE 1991). The Final Phase III RFI/RI Report for OU 1 (DOE 1994) summarized the sampling data. Toluene was detected at a maximum of 160 µg/kg in two boreholes near IHSS 145 and plutonium-239/240 was detected at activities ranging from 0.028 to 0.044 pCi/g.

No Further Action Recommendation

Based on the low concentrations of contaminants in IHSS 145 and correspondingly low risk, IHSS 145 was approved for NFA by the regulatory agencies as documented in the CAD/ROD Declaration for OU 1, 881 Hillside Area (DOE 1997b).

Comments

IHSS 145, while part of OU 1, is geographically in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

OU 1 CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to assure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU 1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

DOE, 1991, Final Phase III RFI/RI Work Plan 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, March.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-147.2

IHSS Number:	147.2
Current Operable Unit:	IA
Former Operable Unit:	12
IHSS Group:	Not Applicable
Unit Name:	Building 881 Conversion Activity Contamination Area

This Final Update to the HRR for PAC 800-147.2 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 147.2 is summarized in this update. The following HRR volumes contain IHSS 147.2 information:

Original Report – 1992 (DOE 1992a);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Dates(s) of Operation or Occurrence

1964 to 1966

Historical Summary

The Building 881 Conversion Activity Contamination Area – IHSS 147.2 is shown on Figure 22. No documentation was found that detailed when items were first stored in an area northeast of Building 881. Interviews with former Rocky Flats employees indicated miscellaneous equipment was stored in this area, such as lathe parts and rolling mill parts. The equipment may have been stored there during the conversion activities that took place in Building 881 in 1964 (DOE 1992a). Interviews with former Rocky Flats employees also indicated it was possible that some of this equipment may have been contaminated with beryllium and/or enriched or depleted uranium; however, the activity levels would not have been high (DOE 1992a).

Aerial photographs show items in this area as early as 1964 and again in 1966. By 1969, the area had been covered by a parking lot. The site is located about 250 ft east of Building 883 and 450 ft south of Central Avenue. It measures approximately 50 ft by 150 ft (DOE 1992a).

IHSS Investigations

IHSS 147.2 was investigated in accordance with the Final RFI/RI Work Plan for OU 12 (DOE 1992b). Investigation results are documented in the OU 12 Technical Memorandum No. 2 (DOE 1995). IHSS 147.2 surface soil was sampled in nine locations for radionuclides and metals. The only positive detections of metals were for calcium (31,500 mg/kg) and zinc (251 mg/kg). Plutonium-239/240 was detected at a maximum activity of 0.49 pCi/g and americium-241 was detected at a maximum activity of 0.114 pCi/g.

No Further Action Recommendation

Based on OU 12 analytical data (DOE 1995), IHSS 147.2 poses no threat of adverse health effects to human receptors. Therefore, in accordance with RFCA (DOE et al. 1996), IHSS 147.2

was proposed for NFA in the 1997 annual update to the HRR (DOE 1997). DOE received approval of NFA status for IHSS 147.2 from CDPHE (the LRA) on July 9, 1999 (CDPHE 1999).

References

CDPHE, 1999, Letter to J. Legare, DOE, from S. Gunderson, CDPHE, RE: Annual Update for the Historical Release Report (September 1997), July 9.

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

DOE, 1992b, Final RFI/RI Work Plan – 400-800 Area – Operable Unit No. 12, Rocky Flats Plant, Golden, Colorado, September.

DOE, 1995, Technical Memorandum No. 2, Operable Unit 12, 400/800 Areas, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-164.2

IHSS Number: 164.2

Current Operable Unit: IA

Former Operable Unit: 14

IHSS Group: 800-4

Unit Name: Radioactive Site 800 Area, Site No. 2, Building 886 Spills

This Final Update to the HRR for PAC 800-164.2 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 164.2 is summarized in this update. The following HRR volumes contain IHSS 164.2 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

1965 to 1989

Historical Summary

The Radioactive Site 800 Area, Site No. 2, Building 886 Spills shown on Figure 22, surrounds former Building 886. Building 886 was a facility for Nuclear Safety Research and Development (R&D). A Summary of Events, provided in Appendix F of the original HRR (DOE 1992), indicated a contamination release on June 9, 1969; however, no details were provided. On September 26, 1989, a 500-gallon stainless steel portable tank (T-27) was found leaking a colorless liquid from its drain valve onto the concrete, creating a wet spot approximately 5 inches in diameter.

In response to the 1989 incident, a radiation monitoring survey of the area resulted in direct counts of 650 cpm, and 12 to 24 dpm on a smear. This was considered low-level contamination. At that time, the valves were tightened, decontaminated, and bagged, and the tank was shipped to the size reduction facility in Building 776. The concrete was decontaminated and sealed with acrylic paint. Soil samples indicated contamination from uranium.

IHSS Investigations

IHSS 164.2 was investigated in accordance with the Phase I RFI/RI Work Plan for OU 14 (DOE 1992b). Twenty-five surface soil samples were collected and analyzed for radionuclides and metals. Americium-241and plutonium-239/240 were detected at activities greater than background, but less than RFCA Tier II surface soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003). The maximum detected activity of americium-241 was 0.18 pCi/g and the maximum detected activity of plutonium-239/240 was 0.92 pCi/g (DOE 1995).

Accelerated action soil sampling at IHSS 164.2 was conducted in November 2002 in accordance with IASAP Addendum #IA-02-03 (DOE 2002). Sixteen surface soil samples and 24 subsurface soil samples were collected in IHSS 164.2. Samples were analyzed for radionuclides, metals, SVOCs, and VOCs. Surface soil results indicated aluminum, barium, beryllium, calcium,

chromium, cobalt, copper, iron, lead, lithium, manganese, nickel, selenium, and strontium were detected at concentrations slightly greater than background for at least one location. All results were less than RFCA Tier I surface soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003). Beryllium, detected at a maximum of 1.2 mg/kg, was the only metal reported at a concentration greater than the RFCA Tier II surface soil AL (1.04 mg/kg [DOE et al. 1996]), but less than the RFCA WRW soil AL (921 mg/kg [DOE et al. 2003]) at one location. The maximum detected activity of americium-241 in surface soil was 4.43 pCi/g. Plutonium-239/240 was not detected in surface soil at levels exceeding background.

Only eight subsurface soil samples had detections of any analytes and most of these were associated with the OPWL (PAC 000-121) locations. Barium, chromium, copper, mercury, and strontium were detected in subsurface soil at concentrations slightly greater than background, but less than RFCA Tier II subsurface soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003). Plutonium-239/240, uranium- 233/234, and uranium-235 were detected at activities greater than background but well below RFCA Tier II subsurface soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003). The maximum detected activities of radionuclides in subsurface soil were as follows: plutonium-239/240, 0.07 pCi/g; uranium-234, 11.9 pCi/g; uranium-235, 0.92 pCi/g; and uranium-238, 1.57 pCi/g. Americium was not detected in subsurface soil in excess of background levels. VOCs were rarely detected, and at concentrations several orders of magnitude below RFCA WRW soil ALs (DOE et al. 2003). Several PAHs were detected and all results were less than RFCA Tier II subsurface soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003). Sampling locations and analytical data are presented in the Final Closeout Report for IHSS Group 800-4 (DOE 2003b).

No Further Action Recommendation

Based upon sampling results, no current or potential contaminant source was identified for IHSS 164.2. As described in the Final Closeout Report for IHSS Group 800-4 (DOE 2003b), analytical results from the previous and the most recent sampling events indicated all COCs were less than RFCA WRW soil ALs. DOE received approval of NFAA status for IHSS 164.2 from CDPHE (the LRA) on May 15, 2003 (CDPHE 2003).

Comments

Building 886 was demolished in 2002.

References

CDPHE, 2003, Gunderson, S.H., Letter to R. DiSalvo, Approval of IHSS Group 800-4 Closeout Report, May 15.

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

DOE, 1992b, Final Phase I RFI/RI Work Plan Operable Unit 14 Radioactive Sites, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995, Data Summary 1 Operable Unit No. 14 Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-03, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-164.3

IHSS Number:	164.3
Current Operable Unit:	IA
Former Operable Unit:	14
IHSS Group:	800-6
Unit Name:	Radioactive Site 800 Area Site No. 2, Building 889 Storage Pad, including Tank 40

This Final Update to the HRR for PAC 800-164.3 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 164.3 is summarized in this update. The following HRR volumes contain IHSS 164.3 information:

Original Report – 1992 (DOE 1992a); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

1958 to the early 2000s

Historical Summary

The Radioactive Site 800 Area Site No. 2, Building 889 Storage Pad is north and west of former Building 889, and surrounds part of former Building 889 and all of former Building 884. Its location is shown on Figure 22. Building 889 was a decontamination facility that was first occupied in 1969. A storage pad north of the building, and an area to the west, were used to store uranium-contaminated equipment and contaminated drums prior to decontamination. A radioactive survey supports that there was contamination at this western location.

Two incidents occurred at Building 889 that involved contaminated drums. On June 16, 1982, uranium chips in a waste drum spontaneously ignited, and on July 20, 1984, a uranium chip fire started in an improperly packed drum. Another incident occurred in September 1983, when nine machine tools were stored outside waiting for decontamination. The plastic sheeting that was covering the equipment had blown off, possibly allowing contamination to spread.

Building 884 was constructed in 1958 as a storage facility for Building 883, and was later used as a mixed-waste storage building. In September 1966, drums were reported to be leaking in the drum storage area outside of this building. Approximately 700 ft^2 of soil and rock were contaminated. It is thought that this information refers to a storage area east of Building 884 that was used prior to the construction of Building 889. Building 884 was demolished in 2003.

Tank 40 was associated with the OPWL and was located in the 800 Area west of Building 889. Tank 40 was reportedly installed in the mid-1950s and was abandoned in 1981 or 1982. The tank consisted of two 400-gallon underground concrete tanks located in a concrete vault. The top of the vault was approximately 7 ft below grade.

IHSS Investigations

IHSS 164.3 was investigated in accordance with the Phase I RFI/RI Work Plan for OU 14 (DOE 1992b). Results are presented in Data Summary No. 1 OU 14 Radioactive Sites (DOE 1995). Surface soil samples were collected at 44 locations in IHSS 164.3 and analyzed for radionuclides. Americium-241 and plutonium-239/240 activities were greater than background levels in a southwest to northeast band across the IHSS. The maximum detected americium-241 activity was 0.36 pCi/g, and the maximum detected plutonium-239/240 activity was 2.2 pCi/g. These activities are well below RFCA WRW soil ALs (DOE et al. 2003).

Accelerated action characterization samples were collected for IHSS 164.3 in accordance with IASAP Addendum #IA-02-01 (DOE 2001). PCOCs at IHSS 800-164.3 and Tank 40 were determined based on process knowledge and data collected prior to the accelerated action during 2002 and included radionuclides, metals, VOCs, and SVOCs (DOE 2001). Nineteen surface soil and 21 subsurface soil samples were collected at IHSS 164.3. Only metals were analyzed in surface soil, as the OU 14 RFI/RI data were considered adequate for radionuclide characterization. Aluminum, barium, calcium, chromium, cobalt, copper, lithium, strontium, and vanadium were detected at least once at concentrations greater than background, but less than RFCA Tier II surface soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003).

Subsurface soil samples were analyzed for radionuclides, metals, and VOCs. Uranium-235 was the only radionuclide detected at activities greater than background and was well below RFCA Tier II subsurface soil ALs (DOE et al. 1996) and RFCA WRW soil ALs (DOE et al. 2003). The maximum activity of uranium-235 in subsurface soil was 0.35 pCi/g. VOCs were rarely detected, and then at concentrations very close to the RL.

A RFCA (DOE et al. 1996) accelerated action was implemented in accordance with ER RSOP Notification #02-02 (DOE 2002). Activities were conducted between May 8 and July 18, 2002, and involved the removal of process waste lines and Tank 40, site grading and vegetation, and characterization. Surface and subsurface soil samples were collected and analyzed after the removal activities. Following the accelerated action, residual contaminant concentrations in soil were less than RFCA WRW soil ALs (DOE et al. 2003). Details and analytical results are provided in the Final Closeout Report for IHSS Group 800-6 (DOE 2003b).

No Further Action Recommendation

Based on the actions taken and residual concentrations of contaminants in soil (DOE 2003b), an NFAA was justified for IHSS 164.3. DOE received approval of NFAA status for IHSS 164.3 from CDPHE (the LRA) on March 25, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. Gunderson, CDPHE, RE: Final Closeout Report for IHSS Group 800-6, March 25.

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

DOE, 1992b, Final Phase I RFI/RI Work Plan Operable Unit 14 Radioactive Sites, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995, Data Summary No. 1 Operable Unit No. 14 Radioactive Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol (ER RSOP) Notification #02-02, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-177

IHSS Number: 177

Current Operable Unit: IA

Former Operable Unit: 10

IHSS Group: 800-5

Unit Name: Building 885 Drum and Paint Storage

This Final Update to the HRR for PAC 800-177 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 177 is summarized in this update. The following HRR volumes contain IHSS 177 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1953 to 2001

Historical Summary

The location of IHSS 177 is shown on Figure 22. The Building 885 Drum Storage Area was first used in 1953 when Building 881 was first occupied. Since 1986, the area was used as a 90-day accumulation area and a satellite collection station until 2001. The storage area occupied two sections of Building 885, located south of Building 881. The western portion of the building was exposed to the north, and the eastern section was exposed to the north and east. A completely enclosed area used for paint storage was located between the two sections. The two exposed sections measured approximately 20 ft by 10 ft. Both had concrete floors; however, there were no berms around the storage areas. Both sections had drums stored on pallets and were used as satellite collection stations (DOE 1992).

Several circumstances that may have resulted in releases include the following:

- In 1972, the drain water from the sump that drains the floor of Building 885 was found to have a temperature of 150 degrees Fahrenheit. The cause of the elevated temperature was unknown as was the source and destination of the liquid (DOE 1992).
- Building 885 was known to have “poor housekeeping” conditions. Paint cans and drums were stored haphazardly, and rainwater was allowed to flow through the building. Any spilled organics would have been carried outside of the building (DOE 1992).
- Inadvertent dumping of radioactively contaminated oil sludge into an open top dumpster located at Building 885 was reported. It is not clear whether there was a release to the environment (DOE 1992).
- Drums contained waste oil, waste paints, waste solvents, and low-level radioactive waste. Radionuclides, metals, SVOCs, and VOCs were considered PCOCs for IHSS 177.

There have been no documented releases (DOE 1992). Building 885 was demolished in 2003.

IHSS Investigations

IHSS 177 was investigated in accordance with the Final Phase III RFI/RI Work Plan (DOE 1991). One borehole was placed downgradient of IHSS 177 to analyze for VOCs, radionuclides, and metals in subsurface soil. The following analytes were detected: americium-241 at 0.0053 pCi/g, plutonium-239/240 at 0.0197 pCi/g, uranium-233/234 at 1.099 pCi/g, uranium-235 at 0.1136 pCi/g, uranium-238 at 1.099 pCi/g, and toluene at 300 µg/kg (DOE 1994).

IHSS 177 was further characterized in accordance with IASAP Addendum #IA-02-04 for IHSS Groups 800-2 and 800-5 (DOE 2002). Two locations were sampled specific to IHSS 177, targeting VOCs, SVOCs, radionuclides, and metals in surface and subsurface soil. Analytical results from the characterization are presented in the Data Summary Report for IHSS Group-800-5 (DOE 2004b). All analytes in surface soil were either not detected or present at concentrations less than background levels. Benzo(a)pyrene was detected at concentrations greater than the RFCA WRW soil AL (DOE et al. 2003) at one subsurface soil location in IHSS 177. This 3,700 µg/kg concentration was determined to be an anomaly, most likely due to asphalt pavement in the area. Other SVOCs were detected at this location, but all were less than RFCA WRW soil ALs (DOE et al. 2003). Uranium-234, uranium-235, and uranium-238 were detected at activities greater than background in subsurface soil at both boreholes, but at activities less than RFCA WRW soil ALs (DOE et al. 2003). Uranium-234 was detected at maximum activities of 2.787 pCi/g, uranium-235 at 0.247 pCi/g, and uranium-238 at a maximum activity of 2.787 pCi/g.

No Further Action Recommendation

Based on analytical results and the SSRS presented in the IHSS Group 800-5 Data Summary Report (DOE 2004b), an NFAA determination was justified for IHSS 177. After review of the IHSS Group 800-5 Data Summary Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 177 on June 21, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Data Summary Report IHSS Group 800-5 (B887 and B885), NFAA - Approval, June 21.

DOE, 1991, Final Phase III RFI/RI Work Plan 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, March.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-04, IHSS Groups 800-2 and 800-5, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 800-5, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-178

IHSS Number: 178

Current Operable Unit: 15

Former Operable Unit: 15

IHSS Group: Not Applicable

Unit Name: Building 881 Drum Storage Area

This Final Update to the HRR for PAC 800-178 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 178 is summarized in this update. The following HRR volumes contain IHSS 178 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1996 Annual (DOE 1996).

Dates(s) of Operation or Occurrence

1953 to 1993

Historical Summary

The Building 881 Drum Storage Area, shown on Figure 22, was first used in 1953 when Building 881 operations began. It was subsequently designated for use as RCRA 90-day accumulation area. The storage area was located in Room 165 and measured 5 ft by 5 ft. A maximum number of five 55-gallon drums were stored at this location. The drums were stored directly on the floor with no surrounding berms (DOE 1992, 1995a).

The drums stored in the IHSS contained waste solvents (VOCs) and possibly low-level radioactive waste. There have been no documented releases or visual evidence of a release (DOE 1992, 1995a). Building 881 was demolished in 2004.

IHSS Investigations

Although no documentation was found to indicate a release to the environment, IHSS 178 was studied as part of OU 15, Inside Building Closures (DOE 1995a), in accordance with the Final Phase I RFI/RI Work Plan for OU 15 (DOE 1993). Thirty radiological smear samples were collected from the IHSS and three hot-water rinsate samples were obtained from the IHSS and associated perimeter and pathway areas. Final radiological surveys were conducted at each of the 30 initial smear sample locations.

No RCRA-regulated constituents of regulatory concern were identified in the IHSS 178 sampling. In addition, none of the data collected during the CERCLA evaluation with respect to radionuclides and beryllium exceeded the screening criteria. IHSS 178 met the federal occupational radiation protection standards, and posed no unacceptable risk to workers.

No Further Action Recommendation

Because IHSS 178 met the clean closure requirements of the Rocky Flats RCRA Permit and the Federal occupational radiation protection standards (DOE 1995a), a CAD/ROD was prepared

recommending clean closure under RCRA and NFA under CERCLA for IHSS 178 (DOE 1995b). The CAD/ROD received final agency approval on October 18, 1995.

Comments

While this is an OU 15 IHSS, it is also geographically situated in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

The CAD/ROD for OU 15 (DOE 1995b) indicates that a 5-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

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

DOE, 1993, Final Phase I RFI/RI Work Plan RFP Inside Building Closures (OU 15), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995a, Phase I RFI/RI Report for OU 15, Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1995b, Corrective Action Decision/Record of Decision for OU 15: Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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

PAC REFERENCE NUMBER: 800-179

IHSS Number: 179

Current Operable Unit: 15

Former Operable Unit: 15

IHSS Group: Not Applicable

Unit Name: Building 865 Drum Storage Area

This Final Update to the HRR for PAC 800-179 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 179 is summarized in this update. The following HRR volumes contain IHSS 179 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

1970 to 1998

Historical Summary

The Building 865 Drum Storage Area was first used in 1970 and was used as a RCRA 90-day accumulation area until late 1998 (exact date unknown). The storage area was in Room 145 and measured 12 ft by 8 ft and its location is shown on Figure 22. The maximum number of 55-gallon drums stored in the unit was 10. The drums were stored directly on a concrete floor with no berms or floor drains (DOE 1992).

The drums contained VOCs, beryllium, and radioactive waste. In the past, chlorinated solvents were also stored at this location. There have been no documented releases and, based on a visual inspection in November 1986, there was no visual evidence of spills (DOE 1992). Building 865 was demolished in 2003.

IHSS Investigations

A review of the inspection records and Room 145 (IHSS 179) was completed on July 11, 2001. No documentation could be found regarding a release or spill from this accumulation area. Moreover, there was no evidence of staining on the concrete floor.

IHSS 179 was studied as part of OU 15 in accordance with the Final Phase I RFI/RI Work Plan for OU 15 (DOE 1993). No releases were identified; however, upon signing of the CAD/ROD for OU 15, IHSS 179 was called out as “deferred” until D&D operations began (DOE 1995).

No Further Action Recommendation

Based upon the review of inspection records, a walk down of the area, and interpretation of the regulations as stated in Comments below, no current or potential contaminant source could be

identified in Room 145; therefore, consistent with criteria set forth in RFCA (DOE et al. 1996), IHSS 179 was proposed for NFA in the 2001 Annual Update to the HRR (DOE 2001).

IHSS 179 was addressed through the consultative process in an NFA Working Group meeting on December 19, 2001. Based on these discussions, agreement was reached that an NFA was justified for IHSS 179 because investigations did not identify any evidence of a release associated with this PAC. An NFA for IHSS 179 was verbally agreed to in the December 19, 2001 meeting and formally approved by CDPHE (the LRA) in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

IHSS 179 was above grade within Building 865 and considered part of the building "structure" removed under D&D programs. Building 865 was demolished to its main foundation slab during 2003. Characterization and removal of concrete slabs and other features associated with Building 865 was conducted during the RFCA (DOE et al. 1996) accelerated action implemented at IHSS Group 800-1 in accordance with ER RSOP Notification #03-02 (DOE 2003). Details are provided in the Closeout Report for IHSS Group 800-1 (DOE 2004).

While this is an OU 15 IHSS, it is also geographically situated in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

The CAD/ROD for OU 15 (DOE 1995) indicates that a 5-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA; RE: Approval of NFA Designation for IHSSs and PACs, Rocky Flats Environmental Technology Site, Golden, Colorado, February 14.

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

DOE, 1993, Final Phase I RFI/RI Work Plan RFP Inside Building Closures (OU15), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995, Corrective Action Decision/Record of Decision for OU15: Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-02 IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Closeout Report for IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-180

IHSS Number: 180

Current Operable Unit: 15

Former Operable Unit: 15

IHSS Group: Not Applicable

Unit Name: Building 883 Drum Storage Area

This Final Update to the HRR for PAC 800-180 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 180 is summarized in this update. The following HRR volumes contain IHSS 180 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

1981 to 1998

Historical Summary

The Building 883 Drum Storage Area was first used in 1981 and continued its use as a RCRA 90-day accumulation area until late 1998 (exact date unknown). The storage area was in Room 104 and measured 16 ft by 10 ft. The location of IHSS 180 is shown on Figure 22. The maximum number of 55-gallon drums stored in the unit was 30. The drums were stored directly on a concrete floor with no berms or floor drains (DOE 1992).

The drums contained waste oils that were usually contaminated with solvents and uranium. Analytical results indicated the presence of VOCs, beryllium, and radioactivity. There have been no documented releases and, based on a visual inspection in November 1986, there was no evidence of spills or leakage (DOE 1992).

IHSS Investigations

A review of the inspection records and Room 104 (IHSS 180) was completed on July, 2001. No documentation could be found regarding a release or spill from this accumulation area. Moreover, there was no evidence of staining on the concrete floor.

IHSS 180 was studied in accordance with the Final Phase I RFI/RI Work Plan for OU 15 (DOE 1993). No releases were identified (DOE 1995).

No Further Action Recommendation

Based upon the review of inspection records, walk down of the area, and interpretation of the regulations as stated in Comments below, no current or potential contaminant source could be identified in Room 104; therefore, consistent with criteria set forth in RFCA (DOE et al. 1996), IHSS 180 was proposed for NFA status in the 2001 Annual Update to the HRR (DOE 2001).

IHSS 180 was addressed through the consultative process in an NFA Working Group meeting on December 19, 2001. Based on these discussions, agreement was reached that an NFA was justified for IHSS 180 because investigations did not identify any evidence of a release associated with this IHSS. An NFA for IHSS 180 was verbally agreed to in the December 19, 2001 meeting and formally approved by CDPHE and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

IHSS 180 was above grade within Building 883 and was considered part of the building "structure" removed under D&D programs. A RFCA (DOE et al. 1996) accelerated action was implemented at IHSS Group 800-3 in accordance with ER RSOP Notification #04-06 (DOE 2003). The action was conducted between August 2004 and April 2005 and included removal of the Building 883 foundation slab and other associated features. These activities are described in the Closeout Report for IHSS Group 800-3 (DOE 2005).

While this is an OU 15 IHSS, it is also geographically situated in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

The CAD/ROD for OU 15 (DOE 1995) indicates that a 5-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA; RE: Approval of NFA Designation for IHSSs and PACs, Rocky Flats Environmental Technology Site, Golden, Colorado, February 14.

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

DOE, 1993, Final Phase I RFI/RI Work Plan RFP Inside Building Closures (OU15), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995, Corrective Action Decision/Record of Decision for OU15: Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #04-06, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2005, Closeout Report for IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 800-211

IHSS Number:	211
Current Operable Unit:	15
Former Operable Unit:	15
IHSS Group:	Not Applicable
Unit Name:	Building 881 Drum Storage Area, Unit 26

This Final Update to the HRR for PAC 800-211 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 211 is summarized in this update. The following HRR volumes contain IHSS 211 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1996 Annual (DOE 1996).

Dates(s) of Operation or Occurrence

1981 to 1993

Historical Summary

The Building 881 Drum Storage Area was first used as a RCRA 90-day accumulation area in 1981. The storage area was located in Room 266B and measured 20 ft by 10 ft and its location is shown on Figure 22. Building 881 was demolished in 2004. The maximum number of 55-gallon drums stored there was 29 (DOE 1992, 1995a).

The wastes stored in IHSS 211 historically included low-level radioactive combustibles (for example, rags and wipes), metals, glass, and materials that contained solvents and/or metals generated by laboratories in the building. There have been no documented releases or visual evidence of a release (DOE 1992, 1995a).

IHSS Investigations

Although no documentation was found to indicate a release to the environment, IHSS 211 was studied in accordance with the Final Phase I RFI/RI Work Plan for OU 15 (DOE 1993). Thirty-two radiological smear samples were collected from IHSS 211 and three hot-water rinsate samples were obtained from the IHSS, perimeter, and pathway areas. Final radiological surveys were performed at each of the 32 initial smear sample locations.

No RCRA-regulated constituents of regulatory concern were identified in the IHSS 211 sampling. In addition, none of the data collected during the CERCLA evaluation exceeded the screening criteria with respect to radionuclides.

No Further Action Recommendation

Because IHSS 211 met the clean closure requirements of the Rocky Flats RCRA Permit and the Federal occupational radiation protection standards (DOE 1995a), a CAD/ROD was prepared, recommending clean closure under RCRA and NFA under CERCLA for IHSS 211 (DOE 1995b). The CAD/ROD received final agency approval on October 18, 1995.

Comments

While this is an OU 15 IHSS, it is also geographically situated in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

The CAD/ROD for OU 15 (DOE 1995b) indicates that a 5-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

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

DOE, 1993, Final Phase I RFI/RI Work Plan RFP Inside Building Closures (OU15), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995a, Phase I RFI/RI Report for OU 15, Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1995b, Corrective Action Decision/Record of Decision for OU 15: Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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

PAC REFERENCE NUMBER: 800-217

IHSS Number:	217
Current Operable Unit:	15
Former Operable Unit:	15
IHSS Group:	Not Applicable
Unit Name:	Building 881 Cyanide Bench-Scale Treatment, Unit 32

This Final Update to the HRR for PAC 800-217 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 217 is summarized in this update. The following HRR volumes contain IHSS 217 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1996 Annual (DOE 1996).

Dates(s) of Operation or Occurrence

1986 through September 1988

Historical Summary

IHSS 217 was a hazardous waste treatment unit located in Room 131C in Building 881. The location of IHSS 217 in Building 881, which was demolished in 2004, is shown on Figure 22. IHSS 217 consisted of a 4-ft by 5-ft painted metal fume hood and laboratory table, three 4-liter polyethylene bottles, a glass beaker, and a chlorine-specific ion electrode. The bench-scale treatment that occurred at this location involved the analysis of the laboratory wastes for cyanide content by using a cyanide still. Wastes from the analysis were collected in 4-liter polyethylene bottles that usually took approximately 2 months to fill. The contents of the bottles were reacted with sodium or calcium hypochlorite to oxidize the cyanide to cyanate. After neutralization was complete, the contents of the bottles were poured down the process waste drain for transport to Building 374 for further treatment (DOE 1992, 1995a).

The wastes involved laboratory waste containing cyanide. There have been no documented releases or visual evidence of a release (DOE 1992, 1995a).

IHSS Investigations

Although no documentation was found to indicate a release to the environment, IHSS 217 was studied in accordance with the Final Phase I RFI/RI Work Plan for OU 15 (DOE 1993). Thirteen radiological smear samples were collected from IHSS 217, along with one hot-water rinsate sample. Final radiological surveys were performed at each of the 13 initial smear sampling locations.

No RCRA-regulated constituents of regulatory concern were identified in the IHSS 217 verification sampling. In addition, none of the data collected during the CERCLA evaluation, with respect to radionuclides, exceeded the screening criteria.

No Further Action Recommendation

Because IHSS 217 meets the clean closure requirements of the Rocky Flats RCRA Permit and the federal occupational radiation protection standards (DOE 1995a), a CAD/ROD was prepared recommending clean closure under RCRA and No Action under CERCLA for IHSS 217 (DOE 1995b). The CAD/ROD received final agency approval on October 18, 1995.

Comments

While this is an OU 15 IHSS, it is also geographically situated in the IA OU for purposes of approval of the Final Remedy CAD/ROD as delineated in RFCA Part 8.

The CAD/ROD for OU 15 (DOE 1995b) indicates that a 5-year review is not required for this IHSS/PAC because hazardous substances, pollutants, or contaminants do not remain above levels that allow for unlimited use and unrestricted exposure.

References

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

DOE, 1993, Final Phase I RFI/RI Work Plan RFP Inside Building Closures (OU 15), Rocky Flats Plant, Golden, Colorado, May.

DOE, 1995a, Phase I RFI/RI Report for Operable Unit 15, Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1995b, Corrective Action Decision/Record of Decision for OU 15: Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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

PAC REFERENCE NUMBER: 800-1200

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-3
Unit Name:	Valve Vault 2

This Final Update to the HRR for PAC 800-1200 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1200 is summarized in this update. The following HRR volume contains PAC 800-1200 information:

Original Report – 1992 (DOE 1992).

Dates(s) of Operation or Occurrence

April 25, 1989

Historical Summary

The location of PAC 800-1200 is shown on Figure 22. During a routine inspection of Valve Vault 2 on April 25, 1989, a leak in the south process transfer line (NPWL) was discovered. The line consisted of a 3-inch PVC Schedule 80 pipe inside a 6-inch polyethylene chase (containment) pipe and originated from the waste tanks in Building 883. Process waste consisted of nitric acid and/or rinsate water contaminated with depleted uranium. The waste was partially neutralized with KaOH before being discharged to Building 374 through Valve Vault 2. Total alpha activity measured 39,000,000 pCi/L (DOE 1992).

Upon detection of the leak, discharge valves from the waste tanks in Building 883 were closed and locked out. Plumbing changes took place within 2 days after the leak was detected to ensure that no more transfers were made through the line. Hydrostatic testing of the inner line began on May 8, 1989, and continued through the month. Removal of the inner line began on May 29 and continued through June 2, 1989. Salt encrustations were found at the elbow where the process waste line exited the nitrad (a combination of HFl and ammonium) pickling operation room (DOE 1992).

During the week of June 5 to 9, 1989, the secondary chase pipe was hydrostatically tested. When it was found to be leaking, the line was inspected by electronic visual imaging on June 15, 1989, to locate the leak (DOE 1992).

Because the release amounts exceed the reportable quantity, the event was reported to the National Response Center on June 15, 1989. RCRA CPIR No. 89-007 was submitted in compliance with 6 CCR 1007-3, 265.56(j).

PAC Investigations

PAC 800-1200 was characterized between August 5, 2004 and April 19, 2005, in accordance with IASAP Addendum #IA-04-06 (DOE 2004). Subsurface soil samples were collected from

eight sampling locations associated with PAC 800-1200, Valve Vault 2, and the NPWL (DOE 2005a). PCOCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated all contaminant concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003). Among these samples, the maximum plutonium-239/240 activity was 0.13 pCi/g, the maximum uranium-235 activity was 0.148 pCi/g, and the maximum uranium-238 activity was 1.675 pCi/g.

A RFCA (DOE et al. 1996) accelerated action was implemented at IHSS Group 800-3 in accordance with ER RSOP Notification #05-04 (DOE 2005b) and the Closure Description Document for Partial Closure of Unit 374.3; 700 and 800 Area Process Waste Transfer System (DOE 2003). As a result, Valve Vault 2 and associated NPWL within PAC 800-1200 were remediated. However, soil remediation was not required for PAC 800-1200 because all accelerated action sampling results were less than RFCA WRW soil ALs (DOE et al. 2003).

Remediation of PAC 800-1200 included removal of the top 4 ft of Valve Vault 2. The remainder of the vault was flow filled. Total uranium-233/234/235 in rinsate from the vault was 0.3.86 g, total plutonium/americium was $6.90E^{-07}$ g. The NPWL line segment from Valve Vault 1 to Valve Vault 2 was completely removed as was the segment from Building 883 to Valve Vault 2. The line from Valve Vault 2 to Valve Vault 3 was RCRA clean closed and left in place. Rinsate from this segment had a combined gross alpha/gross beta of 37.2 pCi/L (DOE 2005c).

No Further Action Recommendation

In accordance with RFCA, an NFAA was justified for PAC 800-1200 based on the following:

- Accelerated action data indicate all residual COC activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the IHSS Group 800-3 Closeout Report did not indicate additional action was necessary (DOE 2005a).

After review of the Closeout Report for IHSS Group 800-3 (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1200 on June 7, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-3, June 7.

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

DOE, 2003, Closure Description Document for Partial Closure of Unit 374.3; 700 and 800 Area Process Waste Transfer System, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004, Industrial Area Sampling and Analysis Plan Addendum #IA-04-06, IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2005a, Closeout Report for IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #05-04, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2005c, Closeout Report for IHSS Group 000-4, New Process Waste Lines (NPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-1201

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-3
Unit Name:	Radioactive Site South of Building 883

This Final Update to the HRR for PAC 800-1201 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1201 is summarized in this update. The following HRR volume contains PAC 800-1201 information:

Original Report – 1992 (DOE 1992).

Dates(s) of Operation or Occurrence

1958 to 1981

Historical Summary

The location of PAC 800-1201 is shown on Figure 22. Contamination in the area between Buildings 883 and 881 was documented as early as 1958. After the plutonium fire in 1957, studies were initiated to determine the spread of contamination. This study was extended to research the impact of Rocky Flats operations on the environment. One particular spot in the 800 Area with significant plutonium contamination was located 500 ft east of the Building 881 road and 500 ft north of Building 881 (prior to construction of Building 883) (DOE 1992).

In 1978, while conducting radiological soil surveys during excavation for a telephone line, readings above background were found approximately 30 ft south of Building 883. Radiological soil surveys found two other spots, one at the northwestern corner of Building 889 and the other at the southeastern corner of Building 865 (DOE 1992).

In 1958, soil samples were collected at the northwestern corner of Building 881 and 20 ft west of the building. Analysis indicated total activities of 4.5×10^4 and 1.5×10^5 dpm/kg, respectively, with some plutonium. During the excavation in 1978, the soil samples were found to contain uranium-235 (DOE 1992).

No documentation of cleanup activities was found in response to the 1958 incident. Removal of contaminated soil in two small areas near Building 883 was completed in April 1981. It is not known whether these are the contaminated areas mentioned in 1978 (DOE 1992).

PAC Investigations

PAC 800-1201 was characterized between August 5, 2004 and April 19, 2005 as part of IHSS Group 800-3 in accordance with IASAP Addendum #IA-04-06 (DOE 2004). Surface soil samples were collected from seven sampling locations and analyzed for radionuclides (DOE 2005a). Analytical results indicated all radionuclide activities were less than the RFCA WRW soil ALs (DOE et al. 2003). Uranium-234, uranium-235, and uranium-238 were detected

at maximum activities of 4.276, 0.268, and 4.276 pCi/g, respectively. No other radionuclides were detected above background levels.

A RFCA (DOE et al. 1996) accelerated action was implemented at IHSS Group 800-3 in accordance with ER RSOP Notification #05-04 (DOE 2005b). Although PAC 800-1201 did not require remediation, storm drain and sewer lines were removed from the PAC 800-1201 area as part of the accelerated action (DOE 2005a).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for PAC 800-1201 based on the following:

- Accelerated action data indicate all radionuclide activities were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 800-3 did not indicate additional action was necessary (DOE 2005a).

After review of the Closeout Report for IHSS Group 800-3 (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1201 on June 7, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-3, June 7.

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

DOE, 2004, Industrial Area Sampling and Analysis Plan Addendum #IA-04-06, IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2005a, Closeout Report for IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #05-04, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-1202

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Sulfuric Acid Spill – Building 883

This Final Update to the HRR for PAC 800-1202 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1202 is summarized in this update. The following HRR volumes contain PAC 800-1202 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

October 21, 1985

Historical Summary

The location of PAC 800-1202 is shown on Figure 22. On October 21, 1985, a battery fell from a forklift or truck. Acid was spilled in the middle of the roadway outside Door No. 11 of Building 883. Approximately 1 quart to 0.5 gallon of sulfuric acid was spilled on the roadway. Sodium bicarbonate was applied to the spill and the area was washed down. No radioactive contamination was involved. The battery was disposed of in the Present Landfill (PAC NW-114) (DOE 1992).

PAC Investigations

No other investigation was required because the spill was cleaned up.

No Further Action Recommendation

PAC 800-1202 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified for PAC 800-1202 because the spill was cleaned up. An NFA for PAC 800-1202 was verbally agreed to in the November 14, 2001 meeting and formally approved by CDPHE and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA; RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 800-1203

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Sanitary Line Break between Buildings 865 and 886

This Final Update to the HRR for PAC 800-1203 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1203 is summarized in this update. The following HRR volumes contain PAC 800-1203 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

June 1982

Historical Summary

The location of PAC 800-1203 is shown on Figure 22. In June 1982, construction crews broke the sanitary sewer line between Buildings 865 and 886. An unknown quantity of sanitary sewage waste was released. The sewage did not reach the Central Avenue ditch; therefore, it was considered at the time that no impact was made to the downstream ponds. No documentation was found that indicated the line was repaired or replaced (DOE 1992).

PAC Investigations

No other investigation was required because there was no environmental impact.

No Further Action Recommendation

PAC 800-1203 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified for PAC 800-1203 because the spill did not reach the local surface water drainage. An NFA for PAC 800-1203 was verbally agreed to in the November 14, 2001 meeting and formally approved by CDPHE and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA; RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 800-1204

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-1
Unit Name:	Building 866 Spills

This Final Update to the HRR for PAC 800-1204 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1204 is summarized in this update. The following HRR volumes contain PAC 800-1204 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1978 to 1998

Historical Summary

As shown on Figure 22, PAC 800-1204 is located west of Building 866. Building 866 contained five process waste tanks that serviced Buildings 865 and 889. Three documented contamination releases associated with filling these tanks are listed below (DOE 1992).

January 1978 - Vent Pipe Overflow

A faulty vacuum breaker for a process waste line vent pipe between Buildings 864 and 881 allowed liquid to be released to the environment. Apparently gravel caused the vent line to stick open, and approximately 2 gallons spilled onto the ground, affecting approximately 16 ft^2 of ground area near the 865 Guard Post. The day following the incident 3 inches of moist gravel were removed (DOE 1992).

Laboratory analysis of the liquid indicated 410,000 dpm/L alpha activity, which consisted predominately of depleted uranium activity. A FIDLER survey of the soil did not indicate any above-background readings (DOE 1992).

1984 - Tank Overflow

A valve was left open while pumping decontamination water to a fill tank in Building 889. When the tank overfilled, the water ran into the sump pump and was then pumped to the process waste tanks in Building 865. These tanks also overfilled, and the water passed up through the vent to the roof where it drained to the ground through the downspouts. The drainage ditch west of Building 866 was dammed with gravel to contain the liquid. Surface gravel from the area of the overflow was supposed to have been removed and shipped as waste. Forty to 45 gallons of liquid were vacuumed up and taken to the Building 889 waste drains (DOE 1992).

The interiors of Buildings 866 and 889 were reportedly decontaminated, and radiation monitoring indicated no contamination. Water samples collected from the northern and southern

ditch revealed 2.2 x 10^3 µg/L total uranium, and a maximum of 7.9 x 10^2 and 5.8 x 10^2 pCi/L for total beta activity and tritium, respectively (DOE 1992).

A similar incident occurred in 1983; however, the water apparently ran into Building 866 instead of outside the building.

1986 - Tank Overflow

The filling of the process waste tanks in Building 866 resulted in an overflow of process waste through the roof vent and out the downspout, releasing approximately 20 gallons to the ground. No contamination was found on the ground or in the building. Liquid-level alarms were installed for each tank (DOE 1992).

The tanks in Building 866 were closed pursuant to RCRA and removed prior to building demolition, which occurred during 2003 (DOE 2004b).

PAC Investigations

PAC 800-1204 was characterized between August 14, 2003 and December 12, 2003 as part of IHSS Group 800-1 in accordance with IASAP Addendum #IA-03-01 (DOE 2003a). Surface and subsurface soil samples were collected from five sampling locations (DOE 2004c). COCs included radionuclides, metals, and VOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003). The maximum activities of uranium isotopes in surface soil were as follows: uranium-234 at 4.59 pCi/g; uranium-235 at 0.28 pCi/g, and uranium-238 at 4.59 pCi/g. Maximum activities observed in subsurface soil were slightly lower. Plutonium-239/240 and americium-241 did not exceed background levels in any of the PAC 800-1204 samples (DOE 2004c).

Remediation of soil in PAC 800-1204 was not necessary because all sampling results were less than RFCA WRW soil ALs (DOE et al. 2003). However, other portions of IHSS Group 800-1 were remediated in a RFCA (DOE et al. 1996) accelerated action implemented in accordance with ER RSOP Notification #03-12 (DOE 2003b). NPWL was removed from the PAC 800-1204 area as part of RFCA accelerated actions (DOE 2004c, 2005a). OPWL was grouted and left in place (DOE 2005b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for PAC 800-1204 based on the following:

- Accelerated action data indicate all residual COC activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 800-1 indicated additional action is not necessary (DOE 2004c).

After review of the Closeout Report for IHSS Group 800-1 (DOE 2004c) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1204 on March 19, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-1, March 19.

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

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY03 Notification #03-12 IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Final Project Closeout Report for Building 865 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004c, Closeout Report for IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2005a, Closeout Report for IHSS Group 000-4 New Process Waste Lines (NPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005b, Closeout Report for IHSS Group 000-2 Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-1205

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-2
Unit Name:	Building 881 – East Dock

This Final Update to the HRR for PAC 800-1205 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1205 is summarized in this update. The following HRR volumes contain PAC 800-1205 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

1953 (date Building 881 occupied) to 2001

Historical Summary

The location of PAC 800-1205 is shown on Figure 22. Building 881's east dock was an area of potential concern because of the production activities that took place in the building. The Draft CEARP Phase I Report indicated the dock was contaminated in February 1960; however, there is no mention of what caused the contamination. The only documented incident occurred on January 7, 1990. Fire Department personnel found a large puddle on the dock. The SOE identified the source as overflow from a condensate pan.

PAC Investigations

PAC 800-1205 was characterized between July 16, 2002 and September 5, 2002 in accordance with IASAP Addendum #IA-02-04 (DOE 2002). Soil samples were collected from five sampling locations and analyzed for radionuclides and metals (DOE 2003b). Radionuclide activities did not exceed background in any of the samples. Metal concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003), with two exceptions:

- The arsenic concentration at sampling location CG34-016 (0 - 2 ft bgs) was 28.1 mg/kg, and the AL is 22.2 mg/kg.
- The barium concentration at sampling location CG34-016 (0 - 2 ft bgs) was 44,500 mg/kg, and the AL is 26,400 mg/kg.

Both concentrations were less than three times their ALs. The arsenic concentration was also very close to its AL and was within its background range. In the case of barium, the 95% UCL of the mean concentration within the AOC was considerably less than the barium WRW soil AL. Based on these findings, soil remediation was not warranted. Characterization results are presented in the Data Summary Report for IHSS Group 800-2 (DOE 2003b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for PAC 800-1205 based on the following:

- Accelerated action data indicate all residual COC activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with the two exceptions noted above, which did not require remediation because they were isolated detections less than three times the RFCA WRW soil AL (DOE et al. 2003).
- Results of the SSRS presented in the Data Summary Report for IHSS Group 800-2 did not indicate additional action was necessary (DOE 2003b).

After review of the Data Summary Report for IHSS Group 800-2 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1205 on July 16, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 800-2, July 16.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-04, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-1206

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Fire, Building 883

This Final Update to the HRR for PAC 800-1206 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1206 is summarized in this update. The following HRR volumes contain PAC 800-1206 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

October 27, 1982

Historical Summary

The location of PAC 800-1206 is shown on Figure 22. A contaminated trash container fire occurred in Building 883 because of grinding operations. Maintenance personnel placed the container outside the building and left it unattended. The Fire Department responded and spread the contents on the ground. No documentation was found that detailed constituents released, except that the container contained contaminated trash. No documentation was found that detailed the fate of constituents released to the environment (DOE 1992).

PAC Investigations

No further investigation was necessary because the spill was trash.

No Further Action Recommendation

PAC 800-1206 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified for PAC 800-1206. An NFA for PAC 800-1206 was verbally agreed to in the November 14, 2001 meeting and formally approved by CDPHE and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA; RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 800-1207

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Transformer 883-4

This Final Update to the HRR for PAC 800-1207 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1207 is summarized in this update. The following HRR volumes contain PAC 800-1207 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1985 to 1987

Historical Summary

The location of PAC 800-1207 is shown on Figure 22. Transformer 883-4 was located at the southeastern corner of Building 883. The transformer was found leaking during an inspection on November 7, 1985. Leaks were also found on January 30, 1986, during an EPA TSCA compliance inspection. This transformer was on the list for cleanup and/or repair on February 11, 1986, because of oil leaks around the top and bottom valves, and the presence of oil on the surface of the concrete transformer pad and the transformer wall (DOE 1992). It was reported that it may have leaked prior to being drained and refilled with non-PCB dielectric oil in either 1986 or 1987 as part of the Rocky Flats Environmental Hazard Elimination Program (Appendix I of 1992 HRR). By 1991, the original pad had been partially removed, and the top was scarified to make room for a new pad that was constructed several feet west (DOE 1991). After retro-filling, the transformer was relocated on the new pad.

Historical records indicate Transformer 883-4 contained dielectric oil with greater than 500 ppm PCBs prior to 1986 (DOE 1992); however, another document indicates the transformer oil was sampled in 1992 and found to contain 6 ppm PCBs. No documentation could be found as to whether smear samples were ever collected at this location (DOE 1996).

The boundaries of the original PAC location were estimated. The boundaries for PAC 800-1207 were revised in the 2004 Annual Update to the HRR, based on sampling location surveys and field reconnaissance.

D&D of Building 883 and associated structures was completed on April 7, 2005.

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, soil samples were collected and analyzed (DOE 1991). The results indicated PCB contamination existed in the soil surrounding the old transformer pad. PCB concentrations were identified at 160 ppm immediately east of the pad, and 12 ppm immediately north of the pad (DOE 1991).

Under the approved Final PAM for Remediation of PCBs (DOE 1995), further sampling was completed in July and August 1995 to verify the lateral and vertical extent of PCB migration. Approximately 28 cy of PCB-contaminated soil were excavated from the old transformer site. The soil was containerized and shipped offsite for disposal (DOE 1997). PCB levels remaining in the soil following the 1995 excavation were less than 10 ppm using EPA Method 4020 and less than 3.1 ppm using EPA Method 8080. Analytical results from the concrete sampling were less than 2.5 ppm PCBs, and the old pad was disposed of in the Present Landfill (PAC NW-114). The excavation site was backfilled and resurfaced with asphalt in August 1995.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on the site remediation and confirmation data, and the White Paper findings noted above, NFAA was recommended as appropriate for PAC 800-1207 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c).

After review of site data and the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1207 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE, 1997, Closeout Report for the Source Removal of PCBs, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in the 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-1208

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Transformer 881-4

This Final Update to the HRR for PAC 800-1208 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1208 is summarized in this update. The following HRR volumes contain PAC 800-1208 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Unknown through 1987

Historical Summary

The location of PAC 800-1208 is shown on Figure 22. Transformer 881-4 was located on the northern side of Building 881. Utilities personnel reported the transformer may have leaked prior to being retrofilled in September 1986 as part of the Rocky Flats Environmental Hazard Elimination Program (Appendix I of 1992 HRR). Visual inspection of the transformer on February 11, 1986, revealed a leak on the top and bottom valves, tap changer, and pad. Another document indicates that residual stains existed on the concrete in January 1987 and that the oil in transformer 881-4 contained 8.4 ppm total PCBs (DOE 1991). In 1992, the transformer was located in a gravel-filled berm with no indication of leaks. The previously mentioned concrete may have existed beneath the gravel. There were no drains in the vicinity (DOE 1992).

Transformer 881-4 contained 435 gallons of dielectric coolant oil while in service. Historical records indicate the oil contained 110 ppm PCBs prior to being retrofilled (DOE 1992).

D&D of Building 881 and associated structures was completed on July 17, 2004.

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, soil samples were collected in accordance with approved EPA sampling protocols and analyzed for PCBs using EPA Method 8080 (DOE 1995). Based on the analytical results, PCB contamination levels in the soil were less than 4.5 ppm (DOE 1996).

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain

dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on the site data and White Paper findings noted above, NFAA was recommended as appropriate for PAC 800-1208 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c).

After review of site data and the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1208 on May 6, 2004 (CDPHE 2004).

Comments

The boundaries of the original PAC 800-1208 location were estimated. For the 2004 Annual Update to the HRR, the boundaries were revised based on sample location surveys and field reconnaissance.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-1209

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Leaking Transformers, 800 Area

This Final Update to the HRR for PAC 800-1209 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1209 is summarized in this update. The following HRR volumes contain PAC 800-1209 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Unknown to 1991

Historical Summary

The location of PAC 800-1209 is shown on Figure 22. Three transformers (883-1, 883-2, and 883-3) and a switchgear apparatus were located on the northern side of Building 883. Utilities personnel reported that all components within this complex may have leaked prior to being retrofilled in 1987 as part of the Rocky Flats Environmental Hazard Elimination Program (Appendix I of 1992 HRR). Oil stains were visible at the valve on one of the transformers. The area was bermed, with rock and gravel placed inside and outside of the berm. There were no drains at this site (DOE 1992).

The boundaries of the original PAC location were estimated. For the 2004 Annual Update to the HRR, the boundaries were revised based on sampling location surveys and field reconnaissance.

Analytical results obtained in 1985 for PCBs in the oil of transformers 883-1, 883-2, and 883-3 were 84, 42, and 17 ppm, respectively. The transformers were retrofilled in 1987 (DOE 1996). Based on 1992 analytical results, PCB contamination levels in the oil of transformers 883-1, 883-2, and 883-3 were 3, 35, and 16 ppm, respectively.

D&D of Building 883 and associated structures was completed on April 7, 2005.

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted July of 1991, soil samples were collected in the vicinity of these transformers and analyzed for PCBs using EPA Method 8080. Based on the analytical results, PCB levels in the soil were less than 6.8 ppm (DOE 1991, DOE 1995).

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the RFCA WRW soil AL of 12.4 ppm (DOE et al. 2003), adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on the site data and White Paper findings noted above, NFAA was recommended as appropriate for PAC 800-1209 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c).

After review of site data and the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1209 on May 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-1210

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-1
Unit Name:	Transformers 865-1 and 865-2

This Final Update to the HRR for PAC 800-1210 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1210 is summarized in this update. The following HRR volumes contain PAC 800-1210 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Unknown to 1987

Historical Summary

The location of PAC 800-1210 is shown on Figure 22. Transformers 865-1 and 865-2 were located north of Building 886 and west of Building 865. Utilities personnel indicated the transformers had leaked in the past. In 1987, the transformers were removed, retrofilled, and placed on a new pad, with berms, several feet to the north as part of the Rocky Flats Environmental Hazard Elimination Program (Appendix I of 1992 HRR). The old pad was partially removed to make room for the new pad. It is unknown whether the old pad had a secondary containment berm (DOE 1996).

That these transformers were retrofilled indicates PCBs may have been involved, but no historical data could be found on PCB concentrations of dielectric coolant oils at PAC 800-1210.

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, surface soil samples were collected and analyzed in accordance with approved EPA protocols (DOE 1991, DOE 1995). PCBs were analyzed using EPA Method 8080 (DOE 1996). PCB results were less than 1.3 ppm in the soil.

PAC 800-1210 was characterized between August 14, 2003 and December 12, 2003 in accordance with IASAP Addendum #IA-03-01 (DOE 2003a). Surface soil samples were collected from seven sampling locations (DOE 2004b). COCs for PAC 800-1210 included radionuclides and PCBs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003). Aroclor-1016, Aroclor-1254, and Aroclor-1260 were detected at the following maximum concentrations: 2.6, 39, and 29 μg/kg, respectively (DOE 2004b).

A RFCA (DOE et al. 1996) accelerated action was implemented at IHSS Group 800-1 in accordance with ER RSOP Notification #03-12 (DOE 2003b). Although soil removal at PAC 800-1210 was not required, the transformer slabs were removed as part of the accelerated action (DOE 2004b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for PAC 800-1210 based on the following:

- Accelerated action data indicate all residual COC concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 800-1 did not indicate additional action was necessary (DOE 2004b).

After review of the Closeout Report for IHSS Group 800-1 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1210 on March 19, 2004 (CDPHE 2004).

Comments

The boundaries of the original PAC 800-1210 location were estimated. For the 2004 Annual Update to the HRR, the boundaries were revised based on sampling location surveys and field reconnaissance (DOE 2004a).

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-1 (B865) - Approval, March 19.

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

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

DOE, 1995, Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

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

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-12, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report for IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden Colorado, March.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 800-1211

IHSS Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Capacitor Leak, Building 883

This Final Update to the HRR for PAC 800-1211 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1211 is summarized in this update. The following HRR volumes contain PAC 800-1211 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

July 5, 1988

Historical Summary

The location of PAC 800-1211 is shown on Figure 22. A capacitor was found leaking at the south entrance of Building 883. The spill involved approximately one pint of oil. A smear sample revealed negative results for PCBs. No documentation was found that detailed the fate of constituents released to the environment.

A smear sample was collected from the concrete where the leak occurred. A glass bottle was placed under the leak and absorbent pads were put on the spill and the area was barricaded.

PAC Investigations

No other PAC 800-1211-specific investigation was deemed necessary.

No Further Action Recommendation

PAC 800-1211 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified for PAC 800-1211 because of the response action taken after the leak was discovered. An NFA was verbally agreed to in the November 14, 2001 meeting and formally approved by CDPHE and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA; RE: Approval of NFA Designation for IHSSs and PACs, Rocky Flats Environmental Technology Site, Golden, Colorado, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 800-1212

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-1
Unit Name:	Building 866 Sump Spill

This Final Update to the HRR for PAC 800-1212 consolidates the information in the Fifth Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 800-1212 is summarized in this update. The following HRR volumes contain PAC 800-1212 information:

Original Report – Fifth Quarterly (DOE 1993); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1992

Historical Summary

The location of PAC 800-1212 is shown on Figure 22. In 1992, liquid and sludge waste was found in a Building 866 concrete sump pit within the secondary containment system for the waste collection tanks (RCRA Units 40.17, 40.18, 40.19, 40.32, and 40.33). Approximately 35 gallons of liquid waste and sludge were retrieved from the pit and determined to contain gross alpha and beryllium contamination. After visual inspection of the sump, it appeared groundwater was seeping into the sump along the northwestern wall, and seepage was especially evident in the northwestern corner. It was concluded that the sump had a visible pathway for waste to enter the environment. Based on noted groundwater seepage into the sump, the possibility also existed that the material in the sump may have been contamination from past spills documented in PAC 800-1204 (DOE 1993).

Responses to the occurrence included the following:

- The associated waste generating processes in Buildings 865 and 889 were shut down.
- The tanks in Building 866 were emptied, with the exception of a very small amount of steam condensate.
- The sump in Building 866 was emptied, the sludge removed, and the sump cleaned.

Secondary containment for the tanks in Building 866 was provided with adequate epoxy sealing of the 2-ft curb surrounding the tanks, as well as the floor and walls of the building. The sump was sealed off from the activities of the building with a steel plate containing a glass window to monitor water levels in the sump pit (DOE 1993).

The tanks in Building 866 were closed pursuant to RCRA, and removed prior to building demolition, which occurred during 2003 (DOE 2004b).

PAC Investigations

PAC 800-1212 was characterized between August 14, 2003 and December 12, 2003 in accordance with IASAP Addendum #IA-03-01 (DOE 2003a). Surface and subsurface soil samples were collected from three sampling locations (DOE 2004c). COCs included radionuclides, metals, and VOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003).

Remediation of soil in PAC 800-1212 was not necessary because all sampling results were less than RFCA WRW soil ALs (DOE et al. 2003). However, other portions of IHSS Group 800-1 were remediated in a RFCA (DOE et al. 1996) accelerated action implemented in accordance with ER RSOP Notification #03-12 (DOE 2003b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996) an NFAA was justified for PAC 800-1212 based on the following:

- Accelerated action data indicate all residual COC activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).
- Results of the SSRS presented in the Closeout Report for IHSS Group 800-1 did not indicate additional action was necessary (DOE 2004c).

After review of the Closeout Report for IHSS Group 800-1 (DOE 2004c) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for PAC 800-1212 on March 19, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-1 (B865) - Approval, March 19.

DOE, 1993, Fifth Quarterly Update for Historical Release Report, July 1, 1993 to October 1, 1993, Rocky Flats Plant, Golden, Colorado, October.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-12, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Final Project Closeout Report for Building 865 Cluster, Draft, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004c, Closeout Report for IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

900 AREA

Figure 23
HRR 900 Area IHSSs and PACs

PAC REFERENCE NUMBER: 900-108

IHSS Number:	108
Current Operable Unit:	BZ
Former Operable Unit:	2
IHSS Group:	Not Applicable
Unit Name:	Trench T-1

This Final Update to the HRR for PAC 900-108 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 108 is summarized in this update. The following HRR volumes contain IHSS 108 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 1998 Annual (DOE 1998a);
Update Report – 1999 Annual (DOE 1999a);
Update Report – 2000 Annual (DOE 2000);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

November 1954 to December 1962

Historical Summary

Trench T-1 is located northwest of the former inner east gate, about 40 ft south of the southeastern corner of the former PA fence. The location of Trench T-1 is shown on Figure 23. Historical documents indicated at least 125 drums of depleted uranium chips (lathe and machine turnings) from Building 444 were packed with lathe coolant and buried in the western and possibly eastern ends of Trench T-1. It was estimated that approximately 25,000 kg of depleted uranium chips were contained in the 125 drums.

Ten drums of cemented cyanide and one drum of still bottoms (recovered waste solvents or evaporated lathe coolant sludge) were also reported buried in Trench T-1. Drums were reportedly double stacked end-on-end and covered with 1-2 ft of soil. Interviews with Site workers suggested that the eastern two-third of the trench was likely to contain trash consisting of pallets, paper, and other debris. The original Trench T-1 dimensions were approximately 200 ft long, 15 ft wide, and 5 ft deep; however, the trench was extended in 1955. Drum packing methods were unclear and varied.

In October 1982, a metal drum was punctured during routine weed cutting. The drum contained a mixture of water and oil. The liquid was pumped into a new drum to await disposal. Another account of a 1982 event may describe the same or a similar incident involving two drums uncovered by weed cutting activities. One drum reportedly contained an oily sludge with 4.3 pCi/g plutonium and 1.2 microcuries per gram (μCi/g) uranium (DOE 1992).

Site inventory lists and receipts indicated the following material may have been placed in the trench:

- Thirty-eight drums of metal turnings and still bottoms were disposed in the trench from November 17, 1954 to June 1, 1956, 10 of which contained cemented cyanide waste. Some of the drums contained copper alloy.
- Eighty-five drums listed in inventories from April 1954 through April 1966 with the exception of a gap from August 1957 through August 1958.
- Two drums of "special" wastes from Building 444, which were placed in Trench T-1 in 1955, were removed and returned to Building 444 in 1956.
- In 1958, authorization was granted for additional disposal in the trench of over 15,000 lbs of depleted uranium chips from Building 444.
- In 1962, authorization was granted for the disposal of approximately 7,500 lbs of depleted uranium chips.

A radiological survey was conducted in the area in October 1977 and an additional radiometric survey was conducted in June 1980. Both identified suspected depleted uranium hot spots. In the summer of 1995, electromagnetic and GPR surveys confirmed the presence of drums and/or metallic objects in the Trench T-1 location. The surveys indicate a majority of the metallic objects were located in the westernmost half of the trench (DOE 1997).

IHSS Investigations

A PAM (DOE1998b), that described proposed RFCA (DOE et al.1966) accelerated action activities at Trench T-1, was developed as part of a CERCLA Accelerated Source Removal Action. The action included the excavation of buried drums and containers, soil, and debris.

The excavation phase of the source removal action was initiated on June 10, 1998 and completed on August 20, 1998. The excavated trench length was 230 ft with 160 drums of depleted uranium, 10 drums of cemented cyanide, and one cardboard carton containing depleted uranium removed from the excavation.

One hundred and seventy-one drums or containers were removed from Trench T-1. Intact drums containing depleted uranium and cemented cyanide were removed, characterized, and overpacked, if possible. If drums did not have sufficient structural integrity, they were place in 1.6 yd^3, B-12 type waste boxes. Debris, including drum fragments, lids, and rings; pipe; cardboard cartons; and sandpaper type material were verified free of depleted uranium and placed in waste containers.

After the removal action was completed, verification samples were collected from the excavation bottom and side-walls. Forty-eight samples were analyzed for radionuclides and VOCs, 38 for PCBs, and 6 for cyanide. Radionuclide results were less than RFCA Tier II soil ALs (DOE et al. 1996), but greater than background values. Americium-241 ranged from 0.38 to 0.54 pCi/g, plutonium-239/240 ranged from 1.69 to 2.36 pCi/g, uranium-234 ranged from1.49 pCi/g to 11.88 pCi/g, uranium-235 ranged from 0.13 to 0.32 pCi/g, and uranium-238 ranged from 1.49 to 11.88 pCi/g in excavation floor and sidewalls. VOC concentrations were very low, and most were below detection levels. Acetone was detected from 35 to 60 µg/kg and all other VOC concentrations were estimated or nondetections. All PCB concentrations were nondetections.

Cyanide results were not compared to RFCA WRW soil ALs (because one does not exist); however, concentrations ranged from nondetection to 29,000 μg/kg (DOE 1999b).

Sampling of the clean soil stockpile (segregated using a FIDLER and organic vapor analyzers during excavation) was conducted and results indicated ALs specified in the PAM were met. This soil stockpile was therefore returned to the excavation. In addition, soil from 1,434 drums of investigation-derived material (IDM) was returned to Trench T-1 as part of the trench backfilling operations. Approval for placement of this material was given by EPA with concurrence by CDPHE. Trench T-1 activities are documented in the Closeout Report for the Source Removal at Trench 1 Site, IHSS 108 (DOE 1999b).

No Further Action Recommendation

No further action was recommended for Trench T-1 (IHSS 108), because a source removal action was completed and verification sampling results indicated all residual concentrations were less than RFCA Tier II soil ALs. Because the source of contamination was successfully removed, IHSS 108 meets the criteria set forth in RFCA (DOE et al. 1996) for NFA.

DOE received approval from EPA (the LRA) and CDPHE of the NFAA status for IHSS 108 on February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

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DOE, 1998b, Final Proposed Action Memorandum for the Source Removal at Trench 1, IHSS 108, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

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DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-109

IHSS Reference Number: 109

Current OU: BZ

Former OU: 2

IHSS Group: NE-2

Unit Name: Trench T-2 (Ryan's Pit)

This Final Update to the HRR for PAC 900-109 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 109 is summarized in this update. The following HRR volumes contain IHSS 109 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996a);
Update Report – 1997 Annual (DOE 1997a); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

Approximately 1969 to 1971

Historical Summary

IHSS 109 (PAC 900-109), a disposal trench located south of the 903 Pad (PAC 900-112), was generally referred to as Ryan's Pit. The location of IHSS 109 is shown on Figure 23. The area was primarily used for disposal of solvents, paint thinners, diesel fuel, and other construction related chemicals/materials (DOE 1992). The waste solvents were reportedly screened for radioactivity and then disposed of in Ryan's Pit if identified as nonradioactive. The trench is referred to as Ryan's Pit (DOE 1996a).

After a review of the information gathered in preparation of the original HRR (DOE 1992), it is believed that Ryan's Pit was not used in the same manner as the East Trenches as previously indicated in the RCRA 3004(u) report (DOE 1987). Based on a review of historical documents, an evaluation of many historical photographs, and interviews with former Plant personnel who were directly involved with Plant waste disposal activities, it is probable that Ryan's Pit was used from approximately 1969 to 1971 for the disposal of supposedly nonradioactive liquid chemical wastes. Previously, Ryan's Pit was believed to have been used similarly to the East Trenches because of discussion in a 1970 document entitled "A Summary of On Site Radioactive Waste Disposal."

Aerial and low-angle oblique photographs dated 1953, 1955, 1957, 1964, 1969, 1970, and 1971 were evaluated. Activities involving on-site burial of sludge from the sanitary wastewater treatment plant occurred from July 1954 through August 1968. These photographs clearly indicate the existence of the East Trenches in various stages of development. Yet none of the photographs from 1953 through 1968 provides any indication of ground disturbances in the area of Ryan's Pit. In 1969 and 1970, there clearly is an open trench in the area south of the 903 Pad

and in the general area as located in the 1970 report. In a May 1971 photograph, the trench is backfilled and graded, but still visible (DOE 1996a).

Solvents that may have been disposed in Ryan's Pit included tetrachloroethane, trichloroethene (TCE), and possibly carbon tetrachloride. These were the solvents typically used at the Plant during 1969 through 1971. Paint thinner, diesel fuel (used as a brush softener), and small quantities of construction-related chemicals were also reportedly disposed. Waste disposal at Ryan's Pit was discontinued in 1971 and the trench was backfilled.

IHSS Investigations

OU2 RFI/RI Activities

IHSS 109 was investigated as part of the Phase II OU 2 RFI/RI in accordance with the OU 2 Phase II Work Plans for alluvium and bedrock (DOE 1991a, 1991b). Soil samples were collected from four boreholes at IHSS 109 and were analyzed for VOCs and radionuclides. trichloroethene and tetrachloroethane were detected at concentrations up to 16,000 μg/kg and 10,000 μg/kg, respectively. BTEX compounds were also detected at elevated levels. Plutonium-239/240 and americium-241 were present in samples at activities up to 83 pCi/g and 12 pCi/g, respectively. Radionuclide contamination was attributed to wind dispersion from the 903 Pad (DOE 1995a).

Trench and Mound Site Characterization Activities

Ryan's Pit characterization was conducted in accordance with the Trench and Mound Site Characterization Work Plan (DOE 1995b). Geophysical surveys determined the exact location of Ryan's Pit. Subsurface samples from four boreholes were analyzed for VOCs. trichloroethene and tetrachloroethane were detected at maximum concentrations of 20,000 μg/kg and 470,000 μg/kg. A groundwater plume of VOCs appeared to be emanating from the Ryan's Pit area (DOE 1996b).

Accelerated Action Activities

Based on the characterization data discussed above, an accelerated action was conducted at IHSS 109 to remediate VOC-contaminated soil and debris. The IHSS 109 Accelerated Action Project was initiated in September of 1995 as a source removal in accordance with the Final PAM approved by the agencies on August 28, 1995 (DOE 1995c). Approximately 180 cy of contaminated soil and debris (primarily crushed drums) were excavated from IHSS 109 and treated by low temperature thermal desorption to eliminate the volatile organic component of contamination in the soil. Treatment of the soil required a CDPHE-approved modification to the existing RCRA Part B permit (DOE 1995d). The removal of contaminated soil from Ryan's Pit was completed in September 1995 and treatment completed in February 1996 in accordance with the RAOs set forth in the approved PAM.

Following excavation, 10 confirmation samples were collected around the periphery of the excavation. All confirmation sampling results were well below the August 1995 construction worker subsurface soil PPRGs (DOE 1997b). Following thermal desorption soil was sampled and analyzed for VOCs to confirm that thermal desorption treatment had reduced VOC concentrations to the performance standards established in the PAM. All results were well within the acceptable range. Treated soil was also analyzed for radionuclides to determine whether or not it met the regulatory requirements to be returned to the excavation. Thirty-three samples were analyzed by HPGe-detection gamma spectroscopy and radionuclide SORs were computed

using RFCA Tier I and Tier II subsurface soil ALs (DOE et al. 1996), and the 95% UCL of uranium-234, uranium-235, uranium-238, americium-241, and plutonium-239/240. The resulting Tier I SOR was 0.11 and the resulting Tier II SOR was 0.6, indicating that soil could be returned to the excavation based on the requirements agreed upon by the agencies and DOE (DOE 1997b).

No Further Action Recommendation

Radiological samples showed plutonium-239, americium-241, uranium-233/234, uranium-235 and uranium-238 at levels above background in the excavated soils; however, these radiological levels were below RFCA Tier II soil ALs and less than the 15 millirem (mrem) hypothetical future resident scenario, the most restrictive scenario for the future land use of the site (DOE 1996a).

Following the accelerated action, on April 3, 2002, during an NFA Status Meeting, EPA and CDPHE concurred with the recommendation for NFA submitted in the 1997 Annual Update to the HRR (DOE 1997). The agencies however requested that the PAC Narrative for PAC 900-109 be amended in the Annual Update to reflect that contaminants in a nearby downgradient groundwater monitoring well(s) (specifically well 07391) had not shown evidence of plume degradation. These comments were incorporated into the narrative and PAC 900-109 was granted NFA status as agreed (CDPHE and EPA 2002).

Comments

The post-treatment levels of VOCs in the treated soils returned to Ryan's Pit were less than the thermal desorption unit performance standards specified in the PAM Permit Modification (DOE 1995d) as documented in the completion report (DOE 1997b).

Potential impacts to surface water were evaluated from existing groundwater data. One un-named seep location near the Woman Creek drainage, that potentially could be related to Ryan's Pit, was sampled in FY2000 and showed tetrachloroethane concentrations at the groundwater Tier II groundwater AL (actual results were 4 ppb) for VOCs. In accordance with RFCA Attachment 5, Section 3, groundwater with contaminant concentrations greater than Tier II groundwater ALs must be evaluated by modeling to determine whether surface water ALs will be exceeded in surface water. In this case, a detection at or just below the Tier II groundwater AL from a seep with nearly zero flow rates could not result in an exceedance of RFCA surface water ALs. Analytical results for the verification samples are presented in the completion report for the project (DOE 1997b).

In accordance with the IM/IRA for Groundwater (DOE 2005) HRC® and HRC-X™ was inserted at 10 locations within an area along the southern wall of the previous source removal action at the southern wall of the former Ryan's Pit excavation. This is the area where the highest residual contamination was present. The 10 insertion points were completed to a depth of 9 ft. This activity was completed on July 6, 2005.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1987, Appendix 1, Resource Conservation and Recovery Act 3004 (u) Waste Management Units, Rocky Flats Plant, Golden, Colorado, December.

DOE, 1991a, Final Phase II RFI/RI (Alluvial) Work Plan, 903 Pad, Mound, and East Trenches Area, Rocky Flats Plant, Golden, Colorado, August.

DOE, 1991b, Final Phase II RFI/RI (Bedrock) Work Plan, 903 Pad, Mound, and East Trenches Area, Rocky Flats Plant, Golden, Colorado, June.

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

DOE, 1995a, Final OU 2, Phase II RFI/RI Report, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1995b, Final Trenches and Mound Site Characterization Work Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1995c, Final Proposed Action Memorandum for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 1995d, Proposed Action Memorandum and Draft Modification of the Corrective Action Section for the Operating Permit for the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

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

DOE, 1996b, Trench and Mound Site Characterization Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Closeout Report for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit, July.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Groundwater Interim Measure/Interim Remedial Action, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-112

IHSS Number:	112
Current Operable Unit:	BZ
Former Operable Unit:	2
IHSS Group:	900-11
Unit Name:	903 Pad

This Final Update to the HRR for PAC 900-112 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 112 is summarized in this update. The following HRR volumes contain IHSS 112 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 1998 Annual (DOE 1998);
Update Report – 1999 Annual (DOE 1999a); and
Update Report – 2000 Annual (DOE 2000)

Date(s) of Operation or Occurrence

1958 to 1968

Historical Summary

Releases from drums stored at the 903 Pad (IHSS 112), shown on Figure 23, were considered the primary source of radiological contamination in the surficial soil in this part of RFETS. Drums that contained hydraulic fluids and lathe coolant contaminated with plutonium and uranium were stored at this location from the summer of 1958 to January 1967. Approximately three-fourths of the drums contained plutonium-contaminated liquids while most of the remaining drums contained uranium-contaminated liquids. Of the drums containing plutonium, the liquid was primarily lathe coolant and carbon tetrachloride in varying proportions. Also stored in the drums were vacuum pump oils, trichloroethene, perchloroethylene, silicone oils, and acetone still bottoms (DOE 1995a).

Leaking drums were noted in 1964 during routine handling operations. The contents of the leaking drums were transferred to new drums, and the area was fenced to restrict access in November 1964. Air samplers at the east fence detected contamination following high winds (DOE 1992). Building 903A was constructed in 1966 to filter and transfer contaminated oil from leaking drums. The building was used to pre-filter the oil from the drums on the 903 Pad that could not be safely moved to Building 774. Oil filtered in Building 903A was also transferred to Building 774 for final processing. The pre-filtering process was considered too time consuming, and the step was eliminated several months after it began (DOE 1992).

In 1967 a total of 5,237 drums were at the 903 Pad. Approximately 420 drums leaked to some degree. Of these, an estimated 50 drums leaked their entire contents. The total amount of leaked material was originally estimated at around 5,000 gallons of contaminated liquid containing approximately 86 g of plutonium (DOE 1995a). Drum removal from the area began in

January 1967 and included drums that were in the storage area for 6 months or less. Soil and rock contaminated by rainwater runoff from the fenced area (east and downgradient of the 903 Pad) were shoveled up and deposited inside the 903 Pad fence.

In June 1968, the drums and pallets were cleared from the area and shipped offsite in waste boxes. The 100,000-ft^2 area was contaminated with activities ranging from 2,000 to 300,000 dpm/100 cm^2. Depth of contamination was to 8 inches or more, possibly up to 18 inches. From 1968 through 1970, some of the radiologically contaminated material was removed, the surrounding area was regraded, and approximately 148,104 ft^2 was covered by an imported fill material, soil sterilant, and an asphalt cap in November 1969. However, during drum removal and remedial activities, wind and rain spread plutonium-contaminated soil to the east and southeast from the 903 Pad area resulting in IHSS 155 (903 Lip Area [PAC 900-155]). Modification to the topography in and around the 903 Pad was completed in April 1971 to allow runoff to flow into Pond C-1 (PAC SE-142.10) on Woman Creek (DOE 1992).

Historic soil removal areas are shown in the Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone, Figure 1-4 (DOE 1999b).

IHSS Investigations

Seven groundwater wells and boreholes were installed in the 903 Pad in 1987. Soil samples from the boreholes indicated VOC concentrations in subsurface soil were equal to or greater than RFCA Tier I subsurface soil ALs (DOE et al. 1996). Monitoring in the alluvial groundwater system indicated elevated concentrations of trichloroethene, tetrachloroethane, and carbon tetrachloride.

Twenty-five surface and subsurface soil samples were collected at the 903 Pad in 1998. Soil samples were analyzed for radionuclides. In the soil horizon directly beneath the asphalt, results at 11 locations were greater than RFCA Tier I soil ALs and results at eight locations were greater than RFCA Tier II soil ALs. In the second soil interval, 0.5 to 1.0 ft, results from one sampling location were greater than RFCA Tier I soil ALs and results from three sampling locations were greater than RFCA Tier II soil ALs. There were no RFCA Tier I or Tier II soil AL radionuclide exceedances in samples collected in the third interval (1.0 to 1.5 ft) (DOE 1999b).

Sixteen boreholes were completed in 1998 in the 903 Pad, and the soil was sampled for the presence of VOCs. Carbon tetrachloride, tetrachloroethane, trichloroethene, and 1,2-cis-dichloroethylene were detected at several boreholes. Detections of VOCs ranged from 1.1 µg/kg to 6,100 µg/kg. All VOCs were less than RFCA Tier I soil ALs. Most VOCs were detected in the northeastern quadrant of the 903 Pad (DOE 1999b).

Based on these data, RFCA (DOE et al. 1996) accelerated actions to remove radionuclide-contaminated soil were conducted at the 903 Pad in accordance with ER RSOP Notification #02-09 (DOE 2002). The accelerated action consisted of the following activities:

1. The asphalt (approximately 6 inches thick) was removed.
2. The gravel base and a minimum of 1 ft of native soil were excavated.
3. A confirmation sample was collected from the bottom of each excavation cell and analyzed at an on-site laboratory.

4. If the result was less than 50 pCi/g between 0 and 3 ft in depth, the cell was backfilled with imported, clean soil.
5. If the result was greater than 50 pCi/g between 0 and 3 ft in depth, additional soil was excavated from the entire excavation cell, and another confirmation sample was collected and analyzed. In many instances, the excavations extend beyond 3 ft in depth.
6. If plutonium-239/240 activities were greater than 1 nCi/g based on confirmation sampling, between 3 and 6 ft in depth, additional soil was excavated and another confirmation sample was collected. There were no plutonium-239/240 activities greater than 1 nCi/g.
7. Removed approximately 4,467 cy of asphalt for disposal as LLW.
8. Removed and characterized fill material for appropriate disposal (including 43 cy of concrete associated with a concrete slab on the western side of the 903 Pad).
9. Removed and disposed of approximately 20,213 cy of soil with contaminant concentrations greater than RFCA WRW soil ALs (DOE et al. 2003). Some of the soil contained VOCs and was disposed of as mixed waste.
10. Collected confirmation samples in accordance with ER RSOP Notification #02-09 (DOE 2002).
11. Backfilled with clean soil, regraded, and revegetated the disturbed area, and added erosion matting to the disturbed area (DOE 2005a).

Confirmation sampling was conducted throughout the removal activity in accordance with ER RSOP Notification #02-09 (DOE 2002). One confirmation sample was collected in each of the 225 grid cells covering the 3.4 acres of the 903 Pad.

Based on the WRW soil ALs, RFCA SORs were calculated for IHSS 112 sampling locations down to 3 ft. SOR calculations were based on accelerated action analytical data for the radionuclides of concern, and all SORs for radionuclides in surface soil from 0 to 3 ft were less than 1. Plutonium-239/240 activities from 0 to 3 ft ranged from 0.08 pCi/g to 44.16 pCi/g. Cell K-2 with plutonium-239/240 activity of 3,463.1 pCi/g in the top 3 ft of soil was remediated as part of the 903 Lip Area (PAC 900-155) accelerated action. All sampling locations within 3 ft of the surface had plutonium-239/240 activities less than 50 pCi/g (DOE 2005a).

Plutonium-239/240 activities between 3 and 6 ft in depth ranged from 1.1 to 297.35 pCi/g. All sampling locations within 6 ft of the surface had plutonium-239/240 activities less than 1 nCi/g. Plutonium-239/240 activities at depths greater than 6 ft ranged from 45.6 to 423.40 pCi/g.

Additional accelerated action analytical data for the 903 Pad were collected during 2005 in accordance with IABZSAP Addendum #IABZ-05-02 (DOE 2005b) to evaluate VOCs in the subsurface. Soil samples were collected from the shallow subsurface (3 to 6 ft) and near the bedrock interface (approximately 15 to 25 ft depending on location). All samples were analyzed for VOCs. Most VOCs were not detected, however, the maximum concentration of the detected VOCs are 1,1,1-trichloroethane at 34.5 μg/kg, acetone at 12.99, carbon tetrachloride at 429.68 μg/kg, chloroform at 43.8 μg/kg, tetrachloroethane at 210 μg/kg, and trichloroethene at 33.7μg/kg.

In accordance with the Groundwater IM/IRA (DOE 2005c), HRC® and HRC-X™ were inserted at 36 points at the 903 Pad. The insertion points were placed along a series of three arcs along the

major groundwater flow path. A combined 5,710 lbs of HRC® and HRC-X™ were used (RCR dated September 9, 2005).

No Further Action Recommendation

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

- Soil removal based on previous investigation results;
- Soil removal based on confirmation sampling results;
- Removal of soil with contaminant concentrations greater than WRW ALs to a depth of 3 ft;
- Final confirmation sampling results;
- Results of the SSRS; and
- Results of the stewardship evaluation.

After review of the Closeout Report for IHSS Group 900-11, IHSS 112, 903 Pad (DOE 2005a) by regulatory agencies, DOE received approval from EPA (the LRA) of the NFAA status for IHSS 112 on January 13, 2005 (EPA 2005).

Comments

None

References

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

DOE, 1995a, Final OU 2 Phase II RFI/RI Report, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1995b, Final Phase II RFI/RI Report, 903 Pad, Mound, and East Trenches Area, Operable Unit No. 2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, 1999a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999b, Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #02-09, Rocky Flats Environmental Technology Site, Golden, Colorado, October

DOE, 2005a, Closeout Report for IHSS Group 900-11, IHSS 112-903 Pad (903 Drum Storage Area), Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2005b, Industrial Area and Buffer Zone Sampling and Analysis Plan Addendum #BZ-05-02, 903 Pad Volatile Organic Compounds, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005c, Groundwater Interim Measure/Interim Remedial Action, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005, Correspondence to J. Legare, DOE, from Mark Aguilar, EPA RE: Closeout Report for IHSS Group 900-11, IHSS 112-903 Pad (903 Drum Storage Area), January 13.

PAC REFERENCE NUMBER: 900-113

IHSS Reference Number: 113

Current Operable Unit: Not Applicable

Former Operable Unit: 2

IHSS Group: Not Applicable

Unit Name: Mound Area

This Final Update to the HRR for PAC 900-113 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 113 is summarized in this update. The following HRR volumes contain IHSS 113 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997a); and
Update Report – 1999 Annual (DOE 1999a).

Date(s) of Operation or Occurrence

August 1954 to September 1958

Historical Summary

In April 1954, the mounding of contaminated combustible wastes from Building 444 was suggested as a method of disposal. The Mound was developed by scraping a shallow trench, aligning drums in rows, and covering them with soil with the resulting burial site extending above initial ground level. The location of the Mound Area (IHSS 113 is shown on Figure 23. Plant photographs from April 21, 1954, show the mounding of the first 869 drums of contaminated wastes from Building 444. The drums were shipped to the Mound area between April 12, 1954, and April 21, 1954. Several drums had pinhole leaks at the time of burial (DOE 1992).

Mounding activities continued until September 1958. Drums from Building 444, Building 869, Building 883, Building 771, and Building 776 were placed in the Mound. Different sides of the Mound were opened periodically for the placement of additional drums. After September 1958, drums were moved to the Mound area but not placed in the mound. In July 1959, they were moved to the 903 Pad area. The burning of uranium-contaminated oil at PAC 900-153 became an acceptable method of disposal in 1959 and mounding was discontinued (DOE 1992).

On February 9, 1959, one drum of liquid waste from Building 776 was punctured at the Mound. Two trucks were contaminated to a level greater than 100,000 cpm and were cleaned at Building 774. Soil contaminated as a result of the punctured drum was removed to a level of 1,000 cpm. One drum of liquid waste from Building 881 leaked at the Mound in April 1960 (DOE 1992), causing contamination greater than 100,000 cpm to the ground and pallets. The area was roped off to be cleaned, but no documentation was found detailing the results of the cleaning effort.

During the construction of the PSZ in 1981, solvent odors were observed at the water table in the Mound area and several areas of uranium-contaminated soil were detected and removed from the Mound area (DOE 1992).

Soil and groundwater contamination resulted from the release of organic liquid wastes from drums stored in the Mound. Radioactive elements of the waste included depleted uranium and enriched uranium with lesser quantities of plutonium.

Beginning on April 14, 1970, the Mound was excavated and all drums were removed by the end of May 1970. Approximately 10 percent of the drums were thought to have holes. No detectable alpha contamination was found in the soil at the time of removal. Solid material was shipped offsite for burial and drums with liquids were sent to Building 774 for processing. Those that were leaking at the time of excavation were pumped into sound drums before processing in Building 774. Empty drums were boxed with absorbent material and shipped for off-site burial. No personnel or equipment contamination resulted from the excavation of the mound and no airborne contamination was detected. Soil from the excavation was graded and excess was placed in the Present Landfill (PAC NW-114). Four wells were drilled in the four corners of the Mound area for groundwater monitoring (DOE 1992).

IHSS Investigations

Phase II OU 2 RFI/RI Activities

The Mound Site (IHSS 113) was investigated in accordance with the Final Phase II RFI/RI Work Plans (Alluvial and Bedrock) (DOE 1991a, 1991b). Six boreholes were sampled within IHSS 113 to characterize the Mound site. VOCs detected in subsurface soil samples were acetone, methylene chloride, tetrachloroethane , trichloroethene, and cis-1,3-dichloropropene. tetrachloroethane was detected at a maximum of 180 µg/kg and trichloroethene was detected at a maximum concentration of 20 µg/kg. In general, VOC concentrations increased with depth to approximately 30 ft bgs, and then decreased. Aroclor-1254 was detected in 2 of 16 samples at a maximum concentration of 21 µg/kg at 0 to 5 ft bgs. Cadmium was detected in 7 of 21 samples at a maximum concentration of 3.3 mg/kg, and arsenic was detected in 2 of 21 samples at a maximum concentration of 20 mg/kg.

Tetrachloroethane was detected in Mound site groundwater at up to 13,000 µg/L. This value exceeds 1 percent of the solubility (150,000 µg/L), indicating that DNAPL may be present (DOE 1995).

Trench and Mound Site Characterization Activities

IHSS 113 was characterized in accordance with the Trench and Mound Site Characterization Work Plan (DOE 1995). The exact location of the Mound site was determined in the field using aerial photographs and by recognizing disturbed soil. Geophysical surveys were not appropriate because all buried material had been previously removed from the site. The Mound Site had been disturbed during the construction of the PA fence, and the Central Avenue Ditch.

Subsurface soil samples were collected from four boreholes at IHSS 113. Methylene chloride was detected at a maximum concentration of 44 µg/kg, tetrachloroethane was detected at a maximum concentration of 760 µg/kg, plutonium-239/240 was detected at a maximum activity of 2.6 pCi/g, and americium-241 was detected at a maximum activity of 0.36 pCi/g (DOE 1996).

Groundwater downgradient from the Mound site contained elevated levels of VOCs, metals, and radionuclides.

Accelerated Action Activities

In accordance with the Agency-approved PAM for the Source Removal at the Mound Site, IHSS 113 in February 1997 (DOE 1997b), a RFCA (DOE et al. 1996) source removal action was initiated at IHSS 113 on March 21, 1997 and completed on April 8, 1997. Contaminated soil was excavated to a depth of 17 ft, approximately 2 ft below the alluvium-bedrock contact. A sampling grid was established whereby 25 nodes were identified along the sidewalls and bottom of the excavation to confirm that the cleanup criteria were met. Two of the excavation bottom samples indicated VOC contamination in excess of the cleanup standard (DOE 1997b). However, the PAM specified that alluvium and highly weathered bedrock would be removed, and did not foresee the removal of unweathered bedrock, which is significantly more difficult to excavate. CDPHE and EPA were consulted and it was agreed to discontinue excavation. There was no radiological contamination identified during removal of the contaminated soils.

Excavated soil from the Mound Site (IHSS 113) was temporarily staged and managed in an area designed for this purpose until treatment could begin. Treatment began on August 5, 1997, using (LTTD) and was completed by August 22, 1997. Treated soil was placed back into the Mound excavation by September 8, 1997. VOC concentrations in treated soils met the treatment goals specified in the PAM, but tetrachloroethane was detected in two confirmation samples in unweathered bedrock from the bottom of the excavation at a maximum concentration of 86,000 µg/kg, exceeding the tetrachloroethane cleanup target of 11,500 µg/kg.

The Mound Site Plume Treatment System was installed in 1998 pursuant to the Final Mound Site Plume Decision Document: A Major Modification to the Final Surface Water IM/IRA Plan/Environmental Assessment and Decision Document for South Walnut Creek (Mound Site Plume Decision Document) (DOE 1997c). System installation is documented in the Final Mound Site Completion Report (DOE 1999b).

The system was installed to prevent contaminated groundwater from the Mound Site from reaching surface water. trichloroethene and tetrachloroethane were the major COCs in groundwater at this site. The Mound Site Plume Treatment System collects and treats contaminated groundwater from the Mound Site and Oil Burn Pit No. 2 (PAC 900-153) area. Installation of the 220-ft-long collection system and two treatment cells containing reactive iron was completed in 1998. Treated water is discharged back into the groundwater on the downgradient side of the treatment cells through a discharge gallery designed to overflow to the surface when the surrounding soils are saturated. Overflow discharges to the surface immediately downgradient of the treatment cell near South Walnut Creek.

<u>No Further Action Recommendation</u>

No further action was recommended for IHSS 113 following the completion of the Mound Source Removal project in 1997, which involved excavating VOC-contaminated soil and treating it with LTTD. The cleanup criteria and objectives as set forth and approved by the regulatory agencies in the PAM for this project (DOE 1997b) were met. Two confirmation samples indicated that VOCs in soil were higher than the cleanup standard. However, because the exceedances were in unweathered bedrock, the agencies agreed to discontinue excavation.

DOE received approval from CDPHE and EPA (the LRA) of the NFA status of IHSS 113 on July 9, 1999 (CDPHE and EPA 1999).

There is groundwater contamination in the IHSS 113 area, which was addressed in the Groundwater IM/IRA (DOE 2005).

Comments

Many references document that the Mound was no longer used for the burial of waste materials after 1959; however, several documents indicate activities at the Mound at later dates. A request was made and approval was given in December 1962 for the burial of 14 drums of depleted uranium waste in the Mound burial area. No documentation was found stating that the burial occurred; yet, documents indicate that Trench T-1 (PAC 900-108), located adjacent to the mound, accepted these drums. Therefore it is assumed that activities occurring at the Mound after September 1958 related to storage activities and not burial (DOE 1992).

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA, RE: Annual Update for the Historical Release Report (September 1997), July 9.

DOE, 1991a, Final Phase II RFI/RI Work Plan (Alluvial), 903 Pad, Mound, and East Trenches, Operable Unit No. 2, Rocky Flats Plant, Golden Colorado, August.

DOE, 1991b, Final Phase II RFI/RI Work Plan (Bedrock), 903 Pad, Mound, and East Trenches, Operable Unit No. 2, Rocky Flats Plant, Golden Colorado, June.

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

DOE, 1995, Final Trenches and Mound Site Characterization Work Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1996, Trench and Mound Site Characterization Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Proposed Action Memorandum for the Source Removal at the Mound Site IHSS 113, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1997c, A Major Modification to the Final Surface Water Interim Measures/Interim Remedial Action Plan/Environmental Assessment and Decision Document for South Walnut Creek (Mound Site Plume Decision Document), Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 1999a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999b, Final Mound Site Completion Report Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005, Groundwater Interim Measure/Interim Remedial Action, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-119.1

IHSS Number: 119.1

Current Operable Unit: 1

Former Operable Unit: 1

IHSS Group: Not Applicable

Unit Name: West Scrap Metal Storage and Solvent Spill Area

This Final Update to the HRR for PAC 900-119.1 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 119.1 is summarized in this update. The following HRR volumes contain IHSS 119.1 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996);
Update Report – 1997 Annual (DOE 1997a);
Update Report – 1998 Annual (DOE 1998); and
Update Report – 1999 Annual (DOE 1999).

Dates(s) of Operation or Occurrence

September 1968 to November 1971

Historical Summary

The location of IHSS 119.1 is shown on Figure 23. This area was one of two sites used for scrap metal storage. IHSS 119.1 was the western site located on a flat area just north of the Southeast Perimeter Road. In September 1968, arrangements were made to move a scrap metal pile (PAC 900-119.2) from its location near the lithium disposal pit (PAC 900-140) to a new area 200 yds to the west. Aerial photographs reveal material in piles and rows in 1969 and 1970. Some of the material stored may have been in drums. The scrap metal was stored for eventual recycle offsite (DOE 1992).

Residual oils and/or hydraulic coolants may have been present on pieces of scrap metal, which could have dripped off into the soil. Higher than normal air samples in November 1971 were attributed to bulldozing the area during scrap metal cleanup activities. Three radiological "hot spots" were found during a routine radiological survey in August 1981 (DOE 1992). Two additional radiological "hot spots" were identified during OU 1 Phase III Final RFI/RI investigations in 1994 (DOE 1994a).

Further investigation during source removal activities indicated the hot spot dimensions were approximately 10 inches in diameter and 12 inches deep, with plutonium-239/240 activities ranging from 10 nCi/g (surface) to 50 pCi/g (at 1 ft) (DOE 1994a).

IHSS Investigations

Groundwater samples collected from monitoring wells installed in the area in 1974 had anomalous concentrations of uranium and nitrate. Additional test holes were drilled in April 1982 to attempt to locate buried materials that might have been contributing leachate into the

well water. No buried debris was located, but several of the test holes were maintained as test sites for water sampling during the three subsequent months (DOE 1992).

The OU 1 881 Hillside groundwater collection and treatment system was installed in 1992. It consisted of a 1,435-ft-long French drain and a separate upgradient collection well within IHSS 119.1. The recovered groundwater was sent to the Building 891 water treatment system, which used ultraviolet light with the addition of hydrogen peroxide to catalyze the breakdown of contaminants to innocuous chemicals (DOE 1995a). The French drain was decommissioned in 2000. Data are no longer collected at this location.

As a result of declining contaminant concentrations at the collection well, the Final Major Modification to the OU 1 CAD/ROD, signed in January 2001 (DOE 2001), included continued extraction and treatment of groundwater from the collection well for an additional 1-year period to verify this downward trend. In accordance with the terms of the Final Major Modification, water recovery and treatment from the collection well were terminated in April 2002, because of the continued decline in contaminant concentrations

In 1994, an Accelerated Response Action (ARA) (DOE 1994b) consisting of the removal of radionuclide contaminated soil at five specific locations within IHSS 119.1 and one location within IHSS 119.2 was conducted. The areas were localized, shallow, contaminated soil that contained substantial activities of either plutonium-239/240, americium-24,1 or uranium, as well as traces of several organic compounds. The ARA included excavation, containerization, storage, and disposal of twenty-one 55-gallon drums of radionuclide-contaminated soil. The drums were disposed of as LLM wastes. The source removal of contaminants from these hot spot areas reduced potential risks by several orders of magnitude (DOE 1995b).

In addition to the ARA, a proposed remedial action for IHSS 119.1 was agreed upon with the regulatory agencies in 1995 as part of the OU 1 CAD/ROD (DOE 1997b). The selected remedial alternative for IHSS 119.1 was to excavate soil with VOC concentrations greater than RFCA Tier I subsurface soil ALs (DOE et al. 1996), treat the soil with thermal desorption, and return the treated soil to the excavation. Additional sampling within IHSS 119.1 was conducted in June 1997 to support implementation of the selected remedial alternative (RMRS 1997). Eleven Geoprobe boreholes were placed downgradient of IHSS 119.1 and an additional 11 Geoprobe boreholes were place in other portions of IHSS 119.1 tentatively identified in the CAD/ROD for excavation. No significant VOC contamination was observed in any of the samples from these borings. Only one contaminant (tetrachloroethane) exceeded the detection limit and none of the sample results were greater the RFCA Tier I subsurface soil ALs (RMRS 1997). As a result, no soil remediation was required or performed. The Final Major Modification to the OU 1 CAD/ROD was signed in January 2001, which eliminated soil excavation as a remedy (DOE 2001).

In accordance with the IM/IRA for IHSS Group 900-11 (903 Lip Area) (DOE 2004), radionuclide hot spots with RFCA radionuclide SORs (DOE et al. 2003) greater than 1 in surface soil were excavated as a RFCA (DOE et al. 1996) accelerated action. Soil was removed, from two locations, in a 10-meter-diameter circle centered on the location of the original sampling point. Excavation continued until confirmation sampling results at the center of the circle was less than RFCA WRW soil ALs (DOE 2005). Residual plutonium-239/240 activities were 4.61 and 5.52 pCi/g.

No Further Action Recommendation

A no further action determination was justified for this IHSS because of the following:

- This IHSS was extensively evaluated as part of OU 1 and is documented in the Final Phase III RFI/RI Report for OU 1, issued in 1994 (DOE 1994a). Removal of the OU 1 radiological "hot spots" within IHSS 119.1 further reduced potential risk to human health and the environment by removing known "source areas" (DOE 1996). The June 1997 sampling demonstrated that subsurface soil at IHSS 119.1 did not serve as a source for groundwater contamination in the vicinity of IHSS 119.1. Additional hot spot removal was conducted as part of the 903 Lip Area IM/IRA (DOE 2004).
- Based upon the June 1997 sampling (RMRS 1997) and observed declining contaminant (trichloroethene) concentrations in the collection and downgradient monitoring wells, an amended remedy for IHSS 119.1 was agreed upon by the Agencies and documented in the Final Major Modification to the OU 1 CAD/ROD (DOE 2001). The amended remedy focused on continued extraction of groundwater from the collection well for a period of one year, coupled with monitoring of groundwater during and after groundwater extraction is discontinued. The remainder of the IHSS was designated for NFA.
- The French drain was decommissioned in 2000. In accordance with the terms of the Final Major Modification to the OU 1 CAD/ROD, water recovery and treatment from the collection well were terminated in April 2002. Groundwater quality in this area continues to be monitored as described in the IMP.

DOE received approval from CDPHE and EPA (the LRA) on the NFA status of IHSS 119.1 (contingent upon implementation of the amended remedy) on July 9, 1999 (CDPHE and EPA 1999). The amended remedy, removal of hot spots, was completed as part of the 903 Lip Area remediation and was approved by EPA (the LRA) on January 13, 2005 (EPA 2005).

Comments

CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to ensure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU 1 is protective and

that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Annual Update for the Historical Release Report (September 1997), Colorado, July 9.

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

DOE, 1994a, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994b, Proposed Action Memorandum, Hot Spot Removal, Operable Unit No. 1, Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1995a, Operable Unit No. 1, 881 Hillside Area, Corrective Measures Study/Feasibility Study, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1995b, Accelerated Response Action Completion Report, Hot Spot Removal, Rocky Flats Environmental Technology Site (Operable Unit No. 1), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

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

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

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

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Final Major Modification to the Operable Unit 1 CAD/ROD, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004, Interim Measure/Interim Remedial Action (IM/IRA) for IHSS Group 900-11 (903 Lip Area and Vicinity, the Windblown Area, and Surface Soil in Operable Unit 1 [881 Hillside]), Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Closeout Report for IHSS Group 900-11, IHSS 900-155, 903 Lip Area, IHSS 900-140, Hazardous Disposal Area Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005, Correspondence to J. Legare, DOE, from M. Aguilar, EPA RE: Closeout Report for IHSS Group 900-11, IHSS 155, 903 Lip Area and IHSS 900-140, January 13.

RMRS, 1997, Sampling and Analysis Plan for the Implementation of the IHSS 119.1 Source Removal Project, Rocky Flats Environmental Technology Site, Golden Colorado, April.

PAC REFERENCE NUMBER: 900-119.2

IHSS Number: 119.2

Current Operable Unit: 1

Former Operable Unit: 1

IHSS Group: Not Applicable

Unit Name: East Scrap Metal Storage and Solvent Spill Area

This Final Update to the HRR for PAC 900-119.2 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 119.2 is summarized in this update. The following HRR volumes contain IHSS 119.2 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

September 1968 to November 1971

Historical Summary

The location of IHSS 119.2 is shown on Figure 23. This area was one of two sites used for scrap metal storage. IHSS 119.2 was the eastern site located on a flat area just north of the Southeast Perimeter Road. In September 1968, arrangements were made to move the scrap metal pile (IHSS 119.2) from its location near the lithium disposal pit (PAC 900-140) to a new area 200 yards to the west in an attempt to limit traffic through the area. The area was located 60 ft north and 50 ft west of the fence marking the Hazardous Disposal Area. Aerial photographs reveal the storage of material in piles in both 1969 and 1970 (DOE 1992).

Residual oils and/or hydraulic coolants on pieces of scrap metal that came from various buildings on Site, may have dripped off into the soil. Higher than normal air samples in November 1971, were attributed to the bulldozing of the area during clean-up activities to disposition the scrap metal (DOE 1992).

IHSS Investigations

IHSS 119.2 was studied as part of OU 1 and the Final Phase III RFI/RI Report for OU 1 was issued in 1994 (DOE 1994a). In 1994, an ARA (DOE 1994b) consisting of the removal of radionuclide contaminated soils at five specific locations within IHSS 119.1 and one location within IHSS 119.2 was conducted. The areas were localized shallow contaminated soil that contained substantial activities of plutonium-239/240, americium-241, or uranium, as well as traces of several organic compounds. The hot spot dimensions were determined to be approximately 10 inches in diameter and 12 inches deep, with activities ranging from 10 nCi/g (surface) to 50 pCi/g (at 1 ft) (DOE 1994b). The ARA included excavation, containerization, storage, and disposal of twenty-one 55 gallon drums of radionuclide contaminated soil. The

drums were disposed of as LLM waste. The source removal of contaminants from these hot spot areas reduced potential risks by several orders of magnitude (DOE 1995).

In accordance with the IM/IRA for IHSS Group 900-11 (903 Lip Area) (DOE 2004), radionuclide hot spots with radionuclide SORs greater than 1 were excavated. Soil was removed in a 10-meter-diameter circle centered on the location of the original sampling point. Excavations continued until confirmation sampling results at the center of the circle were less than RFCA WRW soil ALs (DOE et al. 2003). Confirmation sampling results indicated residual plutonium-239/240 activities were 3.84 pCi/g (DOE 2005).

No Further Action Recommendation

No further action was justified for IHSS 119.2, because radionuclide hot spots were removed as part of the ARA and again as part of the IM/IRA for the 903 Lip Area. NFA for IHSS 119.2 was approved by the Agencies and is documented in the CAD/ROD for OU 1, 881 Hillside Area (DOE 1997b). The removal of hot spots, was completed as part of the 903 Lip Area remediation and was approved by EPA (the LRA) on January 13, 2005 (EPA 2005)

Comments

CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to ensure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

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

DOE, 1994a, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1994b, Proposed Action Memorandum, Hot Spot Removal, Operable Unit No. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1995, Accelerated Response Action Completion Report, Hot Spot Removal, Rocky Flats Environmental Technology Site (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, April.

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

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision Declaration, Operable Unit 1: 881 Hillside Area, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004, Interim Measure/Interim Remedial Action (IM/IRA) for IHSS Group 900-11 (903 Lip Area and Vicinity, the Windblown Area, and Surface Soil in Operable Unit 1 [881 Hillside]), Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Closeout Report for IHSS Group 900-11, IHSS 900-155, 903 Lip Area, IHSS 900-140, Hazardous Disposal Area, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005, Correspondence to J. Legare, DOE, from M. Aguilar, EPA RE: Closeout Report for IHSS Group 900-11, IHSS 155, 903 Lip Area and IHSS 900-140, January 13.

PAC REFERENCE NUMBER: 900-130

IHSS Number:	130
Current Operable Unit:	1
Former Operable Unit:	1
IHSS Group:	Not Applicable
Unit Name:	Contaminated Soil Disposal Area East of Building 881 (IAG Name: Radioactive Site - 800 Area Site No. 1)

This Final Update to the HRR for PAC 900-130 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 130 is summarized in this update. The following HRR volumes contain IHSS 130 information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Dates(s) of Operation or Occurrence

1969 to 1972

Historical Summary

The location of IHSS 130 is shown on Figure 23. An area east of Building 881 was used between 1969 and 1972 to dispose of soil and asphalt contaminated with plutonium and uranium. IHSS 130 contained approximately 320 tons (250 cy) of material that came from three sources: 1) plutonium-contaminated soil and asphalt from the May 1969 fire in Building 776, placed in September 1969, and buried under 1 to 2 ft of fill; 2) road asphalt and soil contaminated with radionuclides from a leaking drum in transit along Central Avenue between Eighth Street and Tenth Street; and 3) 60 cy of plutonium-contaminated soil removed from around the Building 774 (PACs 700-146.1-146.6) process waste tanks in 1972 and covered with 3 ft of soil (DOE 1992, 1997b).

The plutonium-239/240 activity in the 1969 fire debris was estimated at 7.4 dpm/g. The total long-lived alpha activity was estimated at less than 250 dpm/g. The 60 cy buried in 1972 were contaminated with 250 cpm plutonium (DOE 1992).

IHSS Investigations

IHSS 130 was studied as part of OU 1 and the Final Phase III RFI/RI Report for OU 1 was issued in 1994 (DOE 1994). As summarized in the Final Phase III RFI/RI Report, a total of nine boreholes were drilled and sampled within the boundary of IHSS 130 and one borehole was located downgradient. Results indicated americium-241, plutonium-239/240, and the uranium isotopes were detected but at activities at or near background. Toluene was also detected at very low concentrations (DOE 1994).

No Further Action Recommendation

IHSS 130 was recommended for NFA, because the concentration of contaminants at the IHSS was very low. NFA for IHSS 130 was approved by EPA (the LRA) and CDPHE and is documented in the CAD/ROD for OU 1, 881 Hillside Area (DOE 1997b).

Comments

The RCRA 3004(u) report (DOE 1987) mentions without detail that unknown quantities of scrap metal were buried in this area as well. Documentation exists from the same time period indicating an old scrap metal storage area was being cleared of debris. The location was given as south of 903 Pad and east of Building 881. Aerial photographs reflect what may be these areas in the location of PACs 900-119.1 and 900-119.2. These areas were cleared of debris and the debris may have been disposed of in this contaminated asphalt area, but no documentation was found that substantiates this (DOE 1992).

CERCLA Five-Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to ensure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The March 1997 CAD/ROD for OU 1 (DOE 1997b), although a no action decision, stipulated that a Section 121(c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was taken as the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. It was concluded that final remedy for OU1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended.

In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

References

DOE, 1987, Appendix 1, Resource Conservation and Recovery Act 3004 (u) Waste Management Units, Rocky Flats Plant, Golden, Colorado, December.

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

DOE, 1994, Final Phase III RFI/RI Rocky Flats Plant 881 Hillside Area (Operable Unit No. 1), Rocky Flats Plant, Golden, Colorado, June.

DOE, 1997a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1997b, Corrective Action Decision/Record of Decision, Operable Unit 1: 881 Hillside Area, IHSS 119.1, Rocky Flats Environmental Technology Site, Golden Colorado, February, 1997.

DOE, 2002, First Five-Year Review Report For Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-140

IHSS Number:	140
Current Operable Unit:	BZ
Former Operable Unit:	2
IHSS Group:	900-11
Unit Name:	Hazardous Disposal Area

This Final Update to the HRR for PAC 900-140 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 140 is summarized in this update. The following HRR volumes contain IHSS 140 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 1998 Annual (DOE 1998);
Update Report – 2000 Annual (DOE 2000); and
Update Report – 2003 Annual (DOE 2003).

Date(s) of Operation or Occurrence

1956 to 1970

Historical Summary

The Hazardous Disposal Area (IHSS 140), shown on Figure 23, was used for the destruction of reactive metals and other chemicals. IHSS 140 is within the 903 Lip Area (PAC 900-155). Destruction of metallic lithium occurred in the 1950s and 1960s. The destructive reaction process included the disposition of metallic lithium in a trench and subsequent moistening with water to initiate the reaction. After the reaction, the residue (nontoxic lithium carbonate) was covered with fill and buried at the southeastern corner of the site. It is estimated that approximately 400 to 500 lbs of lithium were destroyed at the site. Unknown quantities of other reactive metals (sodium, calcium, and magnesium) and some solvents were also destroyed at this location. In addition, it was thought that nine bottles of nickel carbonyl and one can of iron carbonyl were disposed of in this area (DOE 1992). However, Report No. 317-72-174 Nickel Carbonyl Disposal (DOE 1992) states that "approximately 185 pounds of nickel carbonyl contained in seven 25-pound, two 5-pound cylinders, and one lecture bottle…" were safely emptied and disposed elsewhere on Site.

Previous analytical data (DOE 1995) collected at IHSS 140 indicated several metal concentrations greater than background means plus two standard deviations, but none greater than RFCA WRW soil ALs (DOE et al. 2003).

IHSS Investigations

IHSS 140 RFCA (DOE et al. 1996) accelerated action activities were planned and executed in accordance with the IM/IRA for IHSS Group 900-11 (DOE 2004). Accelerated action activities consisted of determining whether lithium contamination was present in the soil.

Because IHSS 140 was reported to contain a trench or several trenches, a magnetometer study was conducted to determine whether trenches could be detected in the subsurface. Based on the magnetometer study, the study locations were excavated to an approximate 3-ft radius around each location. Soil was removed in 1-ft lifts to an approximate depth of 4 ft bgs. Visible excavated debris was segregated from the excavated soil. Debris consisted of wood, utility poles, fence posts, rebar, and miscellaneous debris. Confirmation samples were collected.

After review of existing data, Nuclear Safety and Industrial Health and Safety Staff approved the excavations to verify the existence of nickel carbonyl. Excavations were controlled through an exclusion zone and all work was conducted using supplied air. Soil was excavated to a depth of 4 ft and nickel carbonyl canisters were not found during excavation (DOE 2005).

Characterization and confirmation sampling was conducted at IHSS 140 in accordance with the IM/IRA for IHSS Group 900-11 (DOE 2004) and through the consultative process (RCR dated October 18, 2004). Ten characterization samples were collected from the surface and the first subsurface soil interval at locations outside the excavated areas and a confirmation sample was collected from the bottom of each excavated area. A total of 22 locations were sampled. All soil samples were analyzed for metals. The highest remaining lithium concentration in surface soil is 33 mg/kg. The RFCA WRW soil AL for lithium is 20,400 mg/kg. Subsurface soil metal concentrations were less than background means plus two standard deviations. Radionuclide confirmation sampling results for IHSS 140 are reported as part of IHSS 155 (DOE 2005).

No Further Action Recommendation

Results of the accelerated action justify NFAA for IHSS 140 based on:

- Characterization and confirmation sampling results were less than RFCA WRW soil ALs;
- Results of the SSRS; and
- Results of the stewardship evaluation.

After review of the Closeout Report for IHSS Group 900-11, IHSS 155 903 Lip Area and IHSS 140 Hazardous Disposal Area (DOE 2005) by regulatory agencies, DOE received approval from EPA (the LRA) of NFAA status for IHSS 140 on January 13, 2005 (EPA 2005).

Comments

None

References

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

DOE, 1995, Final Phase II RFI/RI Report, 903 Pad, Mound, and East Trenches Area, Operable Unit No. 2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Interim Measure/Interim Remedial Action (IM/IRA) for IHSS Group 900-11 (903 Lip Area and Vicinity, the Windblown Area, and Surface Soil in Operable Unit (OU) 1 [881 Hillside]), Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Closeout Report for IHSS Group 900-11, IHSS 900-155, 903 Lip Area, IHSS 900-140, Hazardous Disposal Area Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005, Correspondence to J. Legare, DOE, from M. Aguilar, EPA RE: Closeout Report for IHSS Group 900-11, IHSS 155, 903 Lip Area and IHSS 900-140, January 13.

PAC REFERENCE NUMBER: 900-141

IHSS Number: 141

Current Operable Unit: 6

Former Operable Unit: 6

IHSS Group: Not Applicable

Unit Name: Sludge Dispersal

This Final Update to the HRR for PAC 900-141 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 141 is summarized in this update. The following HRR volumes contain IHSS 141 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997); and
Update Report – 1999 Annual (DOE 1999).

Dates(s) of Operation or Occurrence

1952 to 1991

Historical Summary

The location of IHSS 141 is shown on Figure 23. Sanitary sewer sludge produced in the wastewater treatment plant (Building 995) was placed in a series of gravel- and sand-lined drying beds until the solid to liquid ratio was greater than 43 percent by weight and was considered suitable for packaging and shipment offsite for disposal. The configuration of the beds changed several times since 1952 but they were in regular operation. There were many incidents of the sludge in the beds overflowing toward the East Perimeter Road. Because the beds were open to the atmosphere, sludge was noted to have become airborne and dispersed. The predominant direction of airborne sludge dispersal was to the east.

The chemical characteristics of the sludge were reflective of the chemistry of the waste in the sanitary sewer system. At times, radioactively contaminated wastewater was known or suspected to have entered the sanitary sewer system in production and support buildings. The PAC 000-500 description details routine and nonroutine releases to the sanitary sewer system (DOE 1992). Sludge with small amounts of radionuclides in the drying beds came in contact with underlying soil that was predominantly fill material overlying claystone (DOE 1992).

Several specific incidents occurred when sludge overflowed from the drying beds or was dispersed by wind. A spill occurred on February 4, 1955, that extended to East Perimeter Road. The event occurred while sludge was being pumped from the digester to a drying bed. Analysis of the sludge from this overflow reported a radioactivity level of approximately 1.1×10^6 dpm/kg. Soil samples collected in the area impacted by the overflow had an average radioactivity level of 3.1×10^5 dpm/kg. Soil sampling of the area impacted by the February 1955 overflow was performed by collecting clay and gravel from the area. The sludge which had spilled out of the beds was “largely” recovered. An extensive surface soil sampling program was conducted in

the sludge drying bed area in June 1955. The response to each documented overflow release has been to collect and dispose of the sludge (DOE 1992).

On December 15, 1972, a plutonium-contaminated sludge spill occurred affecting the area from the sludge drying beds to the East Perimeter Road (DOE 1992). The sludge from the December 1972 overflow was controlled with fill material, which was drummed and shipped for off-site disposal. Airborne activity in subsequent months was monitored. In June 1973, air samples collected on East Perimeter Road were unusually high after the area had been disturbed by construction equipment preparing the road for re-asphalting. A report of the incident recommended that care should be exercised relating to dust-producing construction activities in the area (DOE 1992).

In July 1978, ambient air data indicated the sludge drying beds were contributing a higher than normal concentration of plutonium to the air (DOE 1992). In July 1978, windblown sludge was identified as a long-standing problem and an investigation of using mesh cover for the beds followed. In 1985, metal buildings were constructed around the beds to reduce windblown dispersal (DOE 1992).

In January 1982, sludge from three of the drying beds was blown out and dispersed during a windstorm. Measured radioactivity levels of the sludge varied from near background to approximately 1.2×10^6 dpm/kg (DOE 1992).

On February 1, 1991, one of the sludge drying beds overflowed and sludge spilled down the hillside south of the drying beds to South Walnut Creek (DOE 1992).

IHSS Investigations

IHSS 141 was studied as part of OU 6, Walnut Creek Priority Drainage (DOE 1996). Forty surface soil samples were collected and analyzed in IHSS 141. Results indicated chromium, cobalt, copper, iron, lead, mercury, nickel, silver, strontium, vanadium, and zinc were detected at concentrations greater than background values. Chromium was detected once at a concentration of 20.6 mg/kg. Copper was the most frequently detected metal (42%) with a mean concentration of 31.6 mg/kg. All detected metal concentrations were within the same order of magnitude as the background value except for zinc. The maximum americium-241 activity was 1.84 pCi/g and the maximum plutonium-239/240 activity was 10.4 pCi/g. Neither PCBs nor pesticides were detected. Subsurface soil samples were collected at one monitoring well location. Results indicated 2-butanone (maximum concentration 7.5 μg/kg) and toluene (maximum concentration 1.8 μg/kg) were detected. Radionuclides and metals were not analyzed. As documented in the OU 6 RFI/RI Report, IHSS 141 was grouped with IHSSs 165 and 152.6 as an AOC based on the results of the CDPHE conservative screen of the HHRA. The results of the HHRA for the AOC showed that for all current and future onsite receptors, the cumulative HIs for noncarcinogenic health effects are 0.01 or less. Therefore, no adverse noncancer health effects are expected under the exposure conditions evaluated. For all current and future onsite receptors, the excess lifetime cancer risk was estimated at 4×10^{-7} indicating negligible risk. Additionally, results of the ERA for the Walnut Creek Watershed did not indicate IHSS 141 was a source area (DOE 1996). The sludge drying beds were removed as part of the STP dismantlement in 2004.

No Further Action Recommendation

IHSS 141 was proposed for No Further Action in the 1997 Annual Update to the HRR (DOE 1997). The NFA recommendation is consistent with the criteria for recommending NFA decisions presented in RFCA (DOE et al. 1996).

DOE received approval from CDPHE and EPA of the NFA status for IHSS 141 on July 9, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

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

DOE, 1996, Final Phase I RFI/RI Report, Walnut Creek Priority Drainage, Operable Unit 6, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-153

IHSS Number:	153
Current Operable Unit:	BZ
Former Operable Unit:	2
IHSS Group:	900-2
Unit Name:	Oil Burn Pit No. 2

This Final Update to the HRR for PAC 900-153 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 153 is summarized in this update. The following HRR volumes contain IHSS 153 information:

Original Report – 1992 (DOE 1992);
Update Report – 1999 Annual (DOE 1999); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

March 1957 to May 1965

Historical Summary

The location of IHSS 153 is shown on Figure 23. Historical information indicated uranium-contaminated coolant and waste oils from Building 444 and Building 881 were burned in two open pits, designated as IHSS 153 – Oil Burn Pit No. 2. Records indicate the pits were actually two parallel trenches. An estimated 1,354 drums were emptied into the pits and burned between March 1957 and May 1965 (DOE 1992). Unknown organic liquids were also stored at the site. Uranium activity in liquid residues in IHSS 153 was reported as up to 12,000 dpm/L. Approximately 370 cy of depleted uranium residue were estimated to be present in the area prior to removal activities (DOE 1992). Activities at this site likely contributed to groundwater contamination.

During 1978, soil was excavated to a depth of approximately 5 ft in this area. Approximately 500 cy of contaminated soil are reported removed and disposed of at an off-site facility. The cleanup criteria were based on radioactivity measurements and not VOC concentrations.

IHSS Investigations

RFCA (DOE et al. 1996) accelerated action activities were planned for IHSS Group 900-2 (which includes IHSS 153) and executed in accordance with the BZSAP Addendum #BZ-02-01 (DOE 2002), IABZSAP (DOE 2004), ER RSOP (DOE 2003b), and ER RSOP Notification #05-03 (DOE 2005a).

IHSS 153 was initially characterized in accordance with BZSAP Addendum #02-01 (DOE 2002). Eight surface and subsurface soil characterization locations were sampled in April 2002. Results indicated Aroclors-1254 and -1260, tetrachloroethane , and trichloroethene, exceeded RFCA WRW soil ALs (DOE et al. 2003). In January 2004 additional samples were collected to determine the extent of soil removal required.

An accelerated action was conducted in accordance with ER RSOP 05-03 (DOE 2005a). Approximately 1,370 cy of contaminated soil were excavated at IHSS 153. HRC® was added to the excavation area and clean backfill soil at IHSS 153 to enhance degradation of residual VOCs in the subsurface. A gravel drain was installed downgradient of IHSS Group 900-2 to ensure that water through this area is captured and directed to the Mound Site Plume Collection and Treatment System.

During soil removal activities, conducted at IHSS 153 from January through March 2005, 66 characterization, in-process, and confirmation samples were collected. Of the 66 locations sampled, 55 locations, classified as in-process and confirmation locations, were collected within the IHSS 153 remediation area. Nine of the remaining 11 locations, classified as characterization locations, were sampled northwest of the remediation area to determine soil conditions in the vicinity of Functional Channel 5. Analyses included dioxin/furans, PCBs, radionuclides, and VOCs. Following excavation of contaminated soil, confirmation sampling indicated all remaining contaminant concentrations were less than RFCA WRW soil ALs. Confirmation sampling indicated that Aroclor-1254 ranged from 20 to 11,000 μg/kg, Aroclor-1260 ranged from 16 to 12,000 μg/kg, tetrachloroethane ranged from 5.5 to 332,000 μg/kg, and trichloroethene ranged from 0.34 to 11,600 μg/kg. Excavated soil was disposed of based on analytical results as either hazardous, mixed, or TSCA waste (DOE 2005b).

No Further Action Recommendation

NFAA justification for IHSS 153 is presented in the Closeout Report for IHSS Group 900-2 (DOE 2005b). Justification is based on the following:

- The potential sources of contamination (PCBs and VOCs) existing in soil at concentrations greater than RFCA WRW soil ALs in IHSS 153 were removed.
- The excavation area and clean backfill soil at IHSS 153 were treated with HRC®; therefore, residual VOC contamination in the soil and groundwater is expected to exhibit continued degradation in this area.
- A gravel drain was installed downgradient of IHSS Group 900-2 to ensure that water through this area is captured and directed to the Mound Site Plume Collection and Treatment System.
- Residual contaminant concentrations are below RFCA WRW soil ALs in IHSS 153.
- In accordance with the SSRS, subsurface soil in the area is not subject to significant erosion.

DOE received approval from EPA (the LRA) of the NFAA status for IHSS Group 900-2 on June 13, 2005 (EPA 2005b).

Comments

IHSS 153 includes PIC 16.

References

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

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Addendum #02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

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

DOE, 2004, Industrial Area and Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2005a, Environmental Restoration RFCA Standard Operating Protocol Notification #05-03, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2005b, Closeout Report for IHSS Group 900-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005b, Correspondence to J. Rampe, DOE Director, Project Management Division, from C. M. Aguilar, EPA, RE: Closeout Report for IHSS Group 900-2 (IHSS 900-153, Oil Burn Pit No. 2 and IHSS 900-154, Pallet Burn Site), June 13.

PAC REFERENCE NUMBER: 900-154

IHSS Number:	154
Current Operable Unit:	BZ
Former Operable Unit:	2
IHSS Group:	900-2
Unit Name:	Pallet Burn Site

This Final Update to the HRR for PAC 900-154 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 154 is summarized in this update. The following HRR volumes contain IHSS 154 information:

Original Report – 1992 (DOE 1992);
Update Report – 1999 Annual (DOE 1999); and
Update Report – 2003 Annual (DOE 2003).

Dates(s) of Operation or Occurrence

1965

Historical Summary

The location of IHSS 154 is shown on Figure 23. IHSS 154 – Pallet Burn Site is located west of PAC 900-153. Oil-contaminated pallets and other wood debris were burned in this area. Burning activities were conducted during 1965 and the site was removed at an unspecified date in the 1970s. IHSS 154 was identified as being located in the area formerly occupied by the PA security fencing (DOE 1992).

IHSS Investigations

Accelerated action activities were planned and executed in accordance with the BZSAP Addendum #02-01 (DOE 2002). Accelerated action surface and subsurface soil characterization samples were collected at six locations in IHSS 154. Analyses included metals, PCBs, pesticides, radionuclides, SVOCs, and VOCs. Of the six characterization locations sampled in IHSS 154, two exceeded RFCA WRW soil ALs (DOE et al. 2003) for arsenic in subsurface soil. Arsenic concentrations ranged from 15.3 to 55.1 mg/kg and Aroclor-1260 ranged from 9.0 to 63 µg/kg. Additionally, most VOCs were not detected, but tetrachloroethane ranged from nondetected to 1.5 µg/kg. Soil removal was not required because the arsenic exceedances were located in subsurface soil at a depth of 4.5 ft or greater.

No Further Action Recommendation

NFAA justification for IHSS 154 is presented in the Closeout Report for IHSS Group 900-2 (DOE 2005). Justification is based on the following:

- Arsenic is present at concentrations greater than the RFCA WRW soil AL in IHSS 154; however, because the exceedances are located in subsurface soil at a depth of 4.5 ft or greater, the site did not require remediation based on RFCA.

- In accordance with the SSRS, subsurface soil in the area is not subject to significant erosion.

DOE received concurrence from EPA (the LRA) of the NFAA status for IHSS Group 900-2 on June 13, 2005 (EPA 2005).

Comments

None

References

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

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Buffer Zone Sampling and Analysis Plan Addendum #02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, March

DOE, 2003, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Closeout Report for IHSS Group 900-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005, Correspondence to J. Rampe, DOE Director, Project Management Division, from C. M. Aguilar, EPA, RE: Closeout Report for IHSS Group 900-2 (IHSS 900-153, Oil Burn Pit No. 2 and IHSS 900-154, Pallet Burn Site), June 13.

PAC REFERENCE NUMBER: 900-155

IHSS Number:	155
Current Operable Unit:	BZ
Former Operable Unit:	2
IHSS Group:	900-11
Unit Name:	903 Lip Area

This Final Update to the HRR for PAC 900-155 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 155 is summarized in this update. The following HRR volumes contain IHSS 155 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 1998 Annual (DOE 1998);
Update Report – 1999 Annual (DOE 1999a); and
Update Report – 2000 Annual (DOE 2000).

Date(s) of Operation or Occurrence

Approximately 1964 to 1973

Historical Summary

The location of the 903 Lip Area is shown on Figure 23. Waste releases at the 903 Pad (PAC 900-112) are considered the primary source of radiological contamination in surface soil in this part of RFETS. Drums that contained hydraulic fluids and lathe coolant contaminated with plutonium-239/240 and uranium were stored on the Pad. When cleanup operations began in 1967, a total of 5,237 drums were at the 903 Pad. From 1968 through 1970, radiologically contaminated material was removed from the 903 Pad and Lip Area. However, during drum removal and cleanup activities, wind and rain (stormwater erosion) spread plutonium-contaminated soil east and southeast from the 903 Pad area resulting in contamination of the 903 Lip Area. Several limited excavations removed some of the plutonium-contaminated soil from the 903 Lip Area (DOE 1999b, Figure 1-4). However, results from the OU 2 Phase II RFI/RI (DOE 1995) and the Site Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and the Americium Zone (DOE 1999b) confirmed that radionuclide-contaminated soil remained.

IHSS Investigations

Surface and subsurface soil samples from 37 locations were collected around the 903 Pad in the inner lip area in 1998 and analyzed for radionuclides. In the 0.0 to 0.5 ft soil horizon, results at six locations were greater than RFCA Tier I soil ALs (DOE et al.1996), and results at nine locations were greater than RFCA Tier II soil ALs. In the second soil interval, 0.5 to 1.0 ft, results from four sampling locations were greater than RFCA Tier I soil ALs, and results from three sampling locations were greater than RFCA Tier II soil ALs. In the third soil interval (1.0 to 1.5 ft) results from three sampling locations were greater than RFCA Tier II soil ALs.

There were no RFCA Tier I soil AL exceedances in samples collected in the third interval (DOE 1999b).

Eleven hundred and 10 locations were also surveyed in 1998 using HPGe with a 10-meter field-of-view in the inner and outer lip areas. Results from the HPGe measurements indicated one location exceeded RFCA Tier I radionuclide soil ALs and more than 200 locations exceeded the RFCA Tier II soil ALs, mostly in the western portions of the lip area (DOE 1999a).

Based on these data, a RFCA (DOE et al. 1996) accelerated action characterization and soil removal was planned and executed in accordance with the following documents:

- ER RSOP Notification #03-07 (DOE 2003), which addressed accelerated actions in the Inner Lip Area and part of the Outer Lip Area; and
- The IM/IRA for IHSS Group 900-11 (903 Lip Area and Vicinity, the Windblown Area, and Surface Soil in OU 1 [881 Hillside]) (DOE 2004), which addressed accelerated actions in the 903 Outer Lip Area.

Removal activities at the Inner Lip and Outer Lip Areas are briefly described in the following sections.

Inner Lip Area

Removal activities for the Inner Lip Area included the following:

1. The area surrounding the 903 Pad and extending east to the former IHSS 155 inner perimeter fence road was divided into 42-ft grid cells and were given alphanumeric designations. The total number of cells or partial cells identified was 226.
2. Approximately 1 ft of fill was present east of the 903 Pad. This fill was removed before characterization or remediation started.
3. If characterization data were available in a grid cell indicating plutonium-239/240 activity in soil was greater than the RFCA WRW soil AL (DOE et al. 2003), 6 inches of soil was excavated over the entire grid cell, and a confirmation sample was collected.
4. If characterization data were available in a grid cell indicating plutonium-239/240 activity in soil was less than the RFCA WRW soil AL, a confirmation sample was collected.
5. If characterization data were not available in a grid cell, a prescreen sample was collected. If prescreen sample analysis indicated plutonium-239/240 activity in soil was greater than the RFCA WRW soil AL, 6 inches of soil was excavated over the entire grid cell.
6. If characterization data were not available in a grid cell, a prescreen sample was collected. If prescreen sample analysis indicated plutonium-239/240 activity in soil was less than the RFCA WRW soil AL, a confirmation sample was collected.
7. If a confirmation sample indicated plutonium-239/240 activity greater than the RFCA WRW soil AL, additional soil from the entire grid cell was excavated until confirmation samples indicated plutonium-239/240 activity in soil was less than the RFCA WRW soil AL or until 3 ft of native soil was removed and a confirmation sample was collected. Soil with plutonium-239/240 activities greater than 1 nCi/g at depths greater than 3 ft bgs was excavated.

8. Excavated areas were contoured to minimize low areas and for stormwater management. Erosion controls were established, including regrading and the placement of erosion mat, straw bales, and straw wattles, as necessary, in the excavation areas.
9. Small structures, concrete pads, power poles, trees, wells, and other debris were removed and disposed.
10. Monitoring wells designated to remain after completion of the removal action were protected.

Outer Lip Area

Removal activities for the Outer Lip Area included the following:

1. An average of 6 inches of soil was removed from the kriged area (Figure 4 [DOE 2005a]), starting in the western part of the Outer Lip Area and moving east and south. Existing characterization data were used to geostatistically determine the area with a 90 percent probability of having plutonium-239/240 activity greater than 50. The extent of the 903 Lip Area remediation was based on this analysis.
2. Individual confirmation grab samples were collected at 50-ft intervals across the kriged area from the upper 3 inches of remaining soil after excavation.
3. If a confirmation sample indicated plutonium-239/240 activity in soil was greater than the WRW soil AL, additional soil was removed until confirmation samples indicated plutonium-239/240 activity in soil was less than the RFCA WRW soil AL. Soil with plutonium-239/240 activities greater than 1 nCi/g at depths greater than 3 ft bgs would be excavated. There were no locations in the Outer Lip Area where plutionum-239/240 activities were greater than 1 nCi/g.
4. The kriging process indicated some probability of contamination at isolated areas outside the main kriged area, even though there were no data points in these areas. Therefore, approximately 3 inches of soil was removed from these areas and the remaining soil was evaluated with field instruments.
5. Small structures, concrete pads, power poles, trees, wells, and other debris were removed and packaged for disposal.
6. Excavated areas were recontoured to minimize low areas and for stormwater management. Erosion controls were established, including regrading and the placement of erosion mat, straw bales, and straw wattles.
7. Monitoring wells designated to remain were protected.

The accelerated action for IHSS 155, the 903 Lip Area, included excavation and off-site disposal of wind-blown contaminated soil. The following tasks were completed:

- Excavated 36.5 acres in the 903 Lip Area;
- Removed 49,800 cy (65,800 tons) of soil for disposal;
- Filled 3,452 intermodals with soil and shipped offsite for disposal;
- Filled 588 dirt, rubble, and trash (DRT) bags with soil and shipped offsite for disposal; and

- Collected confirmation samples in accordance with the BZSAP (DOE 2002a), ER RSOP Notification #03-07 (DOE 2003), and IM/IRA for IHSS Group 900-11 (DOE 2004).

Accelerated actions at IHSS 155 resulted in the removal of plutonium-contaminated soil with activities greater than 50 pCi/g in the Inner and Outer Lip Areas. Soil with plutonium-239/240 activities greater than the RFCA WRW soil AL (50 pCi/g) were excavated until a confirmation sample returned a result less than 50 pCi/g of plutonium-239/240 or at least 3 ft of material (from the surface) was removed. The highest remaining activity between 0 and 3 ft is 49.881 pCi/g and the lowest activity between 0 and 3 ft is 0.199 pCi/g in the Inner and Outer Lip Areas. The average residual plutonium-239/240 activity is 13.04 pCi/g, and the average excavation depth was 0.9 ft. The average excavation depth in the Inner Lip Area was 1.1 ft, and in the Outer Lip Area it was 0.9 ft. The extent of soil removal is shown on Figure 8 of the Closeout Report for IHSS Group 900-11 (DOE 2005a). At isolated kriged areas outside the main kriged area, approximately 3 inches of soil was removed and the remaining soil was evaluated with field instruments. All surface soil (0 to 3 ft) SORs were less than 1. The highest plutonium-239/240 activity between 3 and 6 ft remaining at IHSS 155 is 12.40 pCi/g of plutonium-239/240 at a depth of 3.3 to 3.5 ft bgs (DOE 2005a).

Additional accelerated action analytical data for the 903 Pad and Lip Area were collected during 2005 in accordance with IABZSAP Addendum #IABZ-05-02 (DOE 2005b) to evaluate VOCs in the subsurface. Soil samples were collected from the shallow subsurface (3 to 6 ft) and near the bedrock interface (approximately 15 to 25 ft depending on location). All samples were analyzed for VOCs. All results were less than WRW soil ALs.

Two locations, adjacent to the southern side of Trench T-12 (PAC NE-1412) with measured plutonium-239/240 activities of 133 pCi/g and 88 pCi/g in surface soil were attributed to the 903 Pad Lip Area (IHSS-155) and remediated as part of the 903 Lip Area IHSS 155 project.

No Further Action Recommendation

This accelerated action resulted in the removal of radioactively contaminated soil from IHSS 155 in IHSS Group 900-11. No soil exceeding the plutonium-239/240 RFCA WRW soil AL remains within 3 ft of the surface.

Results of the accelerated action justify NFAA for IHSS 155 based on:

- Removal of soil with plutonium-239/240 activities greater than the RFCA WRW soil AL to a depth of 3 ft at IHSS 155;
- Confirmation sampling results were less than WRW ALs;
- Results of the SSRS; and
- Results of the stewardship evaluation.

After review of the Closeout Report for IHSS Group 900-11, IHSS 155, 903 Lip Area and IHSS 140, Hazardous Disposal Area (DOE 2005a) by regulatory agencies, DOE received approval from EPA (the LRA) of NFAA status for IHSS 155, on January 13, 2005 (EPA 2005).

Verification sampling in the 903 Lip Area indicated five locations with plutonium-234/240 activities ranging from 52.8 pCi/g to 90.6 pCi/g. Six inches of soil was removed from each location and confirmation samples were collected. Results of the confirmation sampling indicated that residual activities ranged from 0.239 to 0.801 pCi/g.

Verification sampling conducted by DOE indicated that plutonium-239/240 activities were greater than 50 pCi/g in surface soil at 18 locations. Six inches of soil was removed from each location and confirmation samples were collected. Results of the confirmation sampling indicated that residual plutonium-239/240 activities ranged from 0.129 to 35.5 pCi/g.

Comments

None

References

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

DOE, 1995, Final Phase II RFI/RI Report, 903 Pad, Mound, and East Trenches Area, Operable Unit No. 2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, 1999a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999b, Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-07, Rocky Flats Environmental Technology Site, Golden, Colorado, August

DOE, 2004, Interim Measure/Interim Remedial Action (IM/IRA) for IHSS Group 900-11 (903 Lip Area and Vicinity, the Windblown Area, and Surface Soil in Operable Unit 1 [881 Hillside]), Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005a, Closeout Report for IHSS Group 900-11, IHSS 900-155, 903 Lip Area, IHSS 900-140, Hazardous Disposal Area Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2005b Industrial Area and Buffer Zone Sampling and Analysis Plan Addendum #BZ-05-02, 903 Pad Volatile Organic Compounds Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 2005, C. Mark Aguilar letter to J. Legare, RE: Closeout Report for IHSS Group 900-11, IHSS 155, 903 Lip Area and IHSS 900-140, January 13.

PAC REFERENCE NUMBER: 900-165

IHSS Number: 165

Current Operable Unit: IA

Former Operable Unit: 6

IHSS Group: 000-1

Unit Name: Triangle Area

This Final Update to the HRR for PAC 900-165 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 165 is summarized in this update. The following HRR volumes contain IHSS 165 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

1966 to 1975

Historical Summary

The location of IHSS 165 is shown on Figure 23. The Triangle Area, IHSS 165 is located east of and partially overlaps the contractor's storage yard (PAC 900-176). Both IHSSs are located east of the SEP (PAC 000-101) and are bounded by Spruce Avenue and the Northeast Perimeter Road. The area is referred to by many different names including Solar Pond Storage Yard, PU&D Pond Storage Yard, and 779 Storage Yard. Several incidents of leaking storage drums were noted and are described below (DOE 1992).

Drums were first moved into the Triangle Area during the construction of a drum storage area north of Building 883. The contents of the drums stored in the area were recoverable plutonium-bearing wastes and residues. Scrap material awaiting plutonium recovery was also stored in the Triangle Area. Examples of the types of scrap stored are graphite molds, crucibles, combustible wastes awaiting incineration, incinerator ash heels, crucible heels, and Raschig rings. No sludges or oils were stored in the Triangle Area. Some drums contained dilute nitric acid (HNO3), which contributed to the corrosion of the drums (DOE 1992).

Drums with dilute HNO_3 were double-lined with polyethylene bags and stored directly on the ground for the winter of 1966/1967. The following spring, the drums were placed on wooden pallets until 1971 when they were stored in cargo containers. Rigid poly drum liners were used after 1970. In 1973, all plutonium scrap was transferred to indoor storage (DOE 1992).

In 1968, more than 6,000 drums, containing fire waste from the May 1969 fire, were stored in the open field. High winds in the unprotected area blew over as many as 150 drums at a time. Radioactively contaminated salts from the SEP were often blown across the Contractor Storage Yard and Triangle Area and onto the drums. Drum integrity was damaged by collected condensation and drums being blown over. In 1969, approximately 292 leaking drums were discovered.

They were monitored and decontaminated according to the criteria used for spills in indoor processing areas. The leaking drums prompted containment of the drums in cargo containers in 1973. In 1973, some of the cargo containers were noted to be leaking drum contents. About 200 ft^2 of soil received high-level contamination and was shipped off-site (DOE 1992).

In the summer of 1973, two drums containing incinerator ash heels leaked through the floor of the cargo container in which they were stored. In June 1973, 200 yds of plutonium-contaminated soil were temporarily stored on the eastern side of the Triangle Area. The soil came from the excavation of waste storage tanks near Building 774 (PAC 700-146.1 – 146.6) (DOE 1992).

Subsequent to the 1973 drum leaks, the inside floors of the cargo containers were coated with fiberglass for added containment. Alpha surveys were conducted on soil when drums or cargo boxes were moved out of the area. Alpha and gamma surveys of the entire area took place in August 1974. The first FIDLER survey is thought to have taken place in September 1974, with surveys ending in mid-1975. A survey performed in April 1975 indicated no new hot spots and no contaminated soil was removed during that time. Surveys were performed periodically after 1975 and areas of soil were removed as appropriate (DOE 1992).

IHSS Investigations

Based on historical information regarding the drum storage and associated soil staining, soil samples were collected and analyzed for radionuclides, metals, SVOCs, and PCBs in November 2002, in accordance with IASAP Addendum #IA-03-02 (DOE 2002). Surface soil samples were collected from 16 locations within IHSS 165. Results indicated all contaminant concentrations and activities were less than RFCA WRW soil ALs (DOE et al. 2003). Americium-241 activity at IHSS 165 ranged from nondetected to 0.53 pCi/g, uranium-235 ranged from nondetected to 0.23 pCi/g, and arsenic concentrations ranged from nondetected to 13.9 mg/kg. PCBs were not detected at IHSS 165. These locations and associated analytical data are summarized in the IHSS Group 000-1 Data Summary Report (DOE 2003b).

No Further Action Recommendation

No further action was proposed for IHSS 165 in the IHSS Group 000-1 Data Summary Report (DOE 2003b). Based on the analytical results from the soil samples, no current or potential contaminant source was identified for IHSS 165. COCs for this site were not detected above the RFCA soil ALs (DOE et al. 2003).

DOE received approval from CDPHE (the LRA) of NFAA status for IHSS Group 000-1 on July 29, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval of Data Summary Report, IHSS Group 000-1, Rocky Flats Environmental Technology Site, Golden, Colorado, July 29.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002, Addendum #IA-03-02, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group 000-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 900-173

IHSS Number:	173
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	900-1
Unit Name:	South Dock Building 991 (IAG Name: Radioactive Site Building 991)

This Final Update to the HRR for PAC 900-173 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 173 is summarized in this update. The following HRR volumes contain IHSS 173 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1952 to 2003

Historical Summary

The location of IHSS 173 is shown on Figure 23. IHSS 173 originally encompassed Building 991 and associated underground storage vaults/tunnels 996, 997, 998, and 999. The IHSS was later revised to include only the southern dock area of Building 991. The "south dock" of Building 991 is located on the western side of the building and was a loading facility for the vaults/tunnels. The area received moderate to heavy traffic and had been paved for more than 20 years (DOE 2004b).

Products containing plutonium, uranium, and beryllium were received and shipped from the dock. Cleaning solvents were received at the dock, and spent solvents (stored in drums) were shipped from the dock. Reportedly, small parts and equipment were cleaned in the dock area along the northern wall of the asphalt-covered courtyard. In the late 1950s and early 1960s, cleaning of depleted uranium parts was conducted in the courtyard of Building 991, which is located on the western side of the building near the dock. According to Plant records, the dock and courtyard were often washed down with water that could have seeped into cracks and the edge of the asphalt. Spills and water could also have drained into the storm drains (DOE 2004b).

IHSS Investigations

Characterization of IHSS Group 900-1, which includes IHSS 173, was conducted in accordance with IASAP Addendum #IA-03-03 (DOE 2003). Two surface and subsurface soil locations were sampled in IHSS 173 that were analyzed for radionuclides, metals, and VOCs. Results indicated all contaminant concentrations were less than RFCA WRW soil ALs (DOE et al. 2003). Analytical results from the characterization sampling are presented in the Closeout Report for IHSS Group 900-1 (DOE 2004b). A number of metals were detected in surface soil at concentrations greater than background means plus two standard deviations. All concentrations

were several orders of magnitude less than WRW soil ALs except arsenic which was present at a maximum concentration of 13.2 mg/kg. Uranium-234 and uranium-238 were detected at maximum activities of 3.25 pCi/g and uranium-235 was detected at maximum activities of 0.186 pCi/g. In subsurface soil, maximum concentrations for detected metals were: barium at 358 mg/kg, copper at 88 mg/kg, vanadium at 188 mg/kg, and zinc at 194 mg/kg. Uranium-234 and uranium-238 were detected at a maximum activity of 4.074 pCi/g, and uranium-235 was detected once at an activity of 0.241 pCi/g. tetrachloroethane and trichloroethene were detected at one location at concentrations very close to the RL.

No Further Action Recommendation

Based on analytical results and the SSRS, further action is not required and an NFAA determination was justified for IHSS 173 in the Closeout Report for IHSS Group 900-1 (DOE 2004b), because surface and subsurface contaminant concentrations in soil were less than RFCA WRW soil ALs.

After review of the Closeout Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 173 on March 31, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 900-1 (B991 & 993) – Approval, March 31.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-03, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report IHSS Group 900-1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 900-175

IHSS Number:	175
Current Operable Unit:	IA
Former Operable Unit:	10
IHSS Group:	900-4&5
Unit Name:	S&W Building 980 Contractor Storage Facility

This Final Update to the HRR for PAC 900-175 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 175 is summarized in this update. The following HRR volumes contain IHSS 175 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

1980 to 2002

Historical Summary

The location of IHSS 175 is shown on Figure 23. The S&W contractor storage facility is a 25-ft by 25-ft area south of Building 980 that was used for storage of 55-gallon drums. The area was bordered by a 1 to 1 1/2 ft berm on the western, southern, and eastern sides. The drums were placed directly on the ground. No documentation was found identifying leaks or spills, although soil staining was noted in a March 1988 visual inspection.

The wastes stored in the drums were generated in the on-site contractors' maintenance and fabrication shops and typically came from vehicle maintenance and miscellaneous painting activities. Generally, the drums contained waste oils and thinners. Sometime after the March 1988 inspection, the 55-gallon drums were removed and the area was regraded and covered with clean gravel.

IHSS Investigations

Based on historical information regarding the drum storage and associated soil staining, soil was sampled at six surface locations within IHSS 175 in April 2002. Analyses were conducted for metals, inorganics, SVOCs, and radionuclides in accordance with IASAP Addendum #IA-02-02 (DOE 2002). Results indicate that americium-241 was detected a maximum activity of 1.23 pCi/g, plutonium-239/240 was detected at a maximum activity of 13.18 pCi/g, and uranium-238 at 2.9 pCi/g. Copper, chromium, nickel, and tin were detected at all locations and had maximum concentrations of 74.4, 114, and 69.7 mg/kg, respectively. All contaminant concentrations and activities were less than RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

IHSS 175 was recommended for NFAA in the Data Summary Report for IHSS Group 900-4&5 (DOE 2003b) for the following reasons:

- All contaminant concentrations were less than WRW ALs.
- Based on the analytical results and the distance to the nearest surface water body, IHSS Group 900-4&5 did not appear to have adversely impacted surface water.

After review of the Data Summary Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 175 on July 23, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval, Data Summary Report, IHSS Group 900-4&5 (PAC 900-175, S&W B980 Contractor Storage Facility), July 23.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-02, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group 900-4&5, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 900-176

IHSS Number:	176
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	000-1
Unit Name:	S&W Contractor Storage Yard

This Final Update to the HRR for PAC 900-176 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 176 is summarized in this update. The following HRR volumes contain IHSS 176 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

1960 to 2002

Historical Summary

The location of IHSS 176 is shown on Figure 23. The S&W contractor storage yard was located east of SEP Ponds 207B-Center and 207B-South (PAC 000-101) and partially overlapped the Triangle Area (PAC 900-165). The Contractor Storage Yard was considered a potential AOC because of wind-blown radioactive nitrate spray from the adjacent SEP and the hazardous nature of some of the contractor material stored in the yard (DOE 1992).

Construction of the 207B series of SEP was completed in June 1960. The adjacent area east of these ponds became a contractor storage yard sometime after 1966 but before 1969. Most of the structures and equipment stored in the yard were affected by spray from the ponds. High winds blew low-level (102 dpm/100 cm^2) contamination and salts out of the SEP onto equipment that was stored in the S&W area. The water in SEP historically contained elevated concentrations of nitrate and low-level concentrations of radioactivity, as well as VOCs and inorganic components (DOE 1992). Alpha surveys were performed periodically to evaluate conditions surrounding the SEP. No significant alpha contamination was found (DOE 1992).

The primary use of the yard was the storage of surplus or raw materials. Drums containing construction material, which qualified as hazardous waste, were stored in the area until 1985. Drums were placed directly on the ground or on wooden pallets. In general, the drums stored in the storage yard contained waste oils with some VOCs and metals. Building 964 was located in the area until late 2002 and was used for the storage of hazardous waste. There are no documented releases to the environment from waste storage practices from Building 964 (DOE 1992).

In August 1988, a fuel oil spill of unknown quantity occurred in the yard as a result of a leaking portable heating unit. The quantity of fuel oil spilled was not reportable (DOE 1992). The oil-soaked soil was excavated and transported to the Present Landfill (PAC NW-114). All drums

containing hazardous waste or constituents were removed by March 1988. After 1988, the area was primarily used to store equipment.

IHSS Investigations

Because of this area's history and proximity to other IHSSs, seven surface soil samples were collected in the IHSS 176 area in November 2002, and analyzed for radionuclides, metals, SVOCs, and PCBs in accordance with the IASAP Addendum #IA-03-02 (DOE 2002). Results indicated all contaminant concentrations and activities were less than RFCA WRW soil ALs (DOE et al. 2003). Americium-241 activity at IHSS 176 ranged from nondetected to 2.0 pCi/g, uranium-235 ranged from nondetected to 0.25 pCi/g, and arsenic concentrations ranged from nondetected to 18.9 mg/kg. Aroclor-1254 was detected at maximum concentration of 66 µg/kg. Sampling locations and analytical data are presented in the Group 000-1 Data Summary Report (DOE 2003b).

No Further Action Recommendation

IHSS 176 was recommended for NFAA based on the results of the soil samples collected. There were no COCs at IHSS 176 detected at concentrations greater than the RFCA WRW soil ALs (DOE et al. 2003).

DOE received approval from CDPHE (the LRA) of NFAA status for IHSS Group 000-1 on July 29, 2003 (CDPHE 2003).

Comments

IHSS 176 partially overlaps IHSS 165. IHSS 176 includes PIC 47 and may be the location of PIC 51.

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Approval of Data Summary Report, IHSS Group 000-1, July 29.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002, Addendum #IA-03-02, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Group 000-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 900-183

IHSS Number:	183
Current Operable Unit:	BZ
Former Operable Unit:	2
IHSS Group:	Not Applicable
Unit Name:	Gas Detoxification Area

This Final Update to the HRR for PAC 900-183 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 183 is summarized in this update. The following HRR volumes contain IHSS 183 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997);
Update Report – 2000 Annual (DOE 2000);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

Approximately 1963 to Approximately 1983

Historical Summary

The location of IHSS 183 is shown on Figure 23. Building 952 was constructed in 1963 as a toxic gas storage building. Beginning in approximately January 1967, bottles containing hazardous gases were transported from various buildings to Building 952 for storage. Typically, shipments consisted of one or two lecture-size gas bottles. Gases were stored up to 5 years prior to disposal; however, select gases were detoxified at the site. Other gases were packed and shipped to off-site vendors for disposal (DOE 1992).

Select gases were detoxified using various commercial neutralization processes available at the time. Neutralization processes included reaction with water, acid, caustic, carbon, or air. Byproducts were disposed of as process wastes. Upon completion of the neutralization process for each type of gas, the glassware used in the process was triple-rinsed, crushed, and deposited in the Present Landfill (PAC NW-114) (DOE 1992).

IHSS Investigations

IHSS 183 was studied as part of the OU 2 RFI/RI and, for investigative purposes, was grouped with PAC 900-140 because of the close proximity of these two IHSSs. Of the nine boreholes located within IHSS 140, one borehole was located near IHSS 183. Surface and subsurface soil samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, metals, and radionuclides. Only methylene chloride (2 ppb) and acetone (15 ppb) were detected in the borehole. These chemicals were not retained in the OU 2 RFI/RI or the associated human health risk assessment as chemicals of concern (DOE 1995). With respect to ecological receptors,

IHSS 183 was not identified as a source area in the ERA for the Woman Creek Watershed (DOE 1996).

No Further Action Recommendation

Based on the lack of any evidence for, or documentation of, past releases from this IHSS, and the sampling results from the OU 2 RFI/RI (DOE 1995a), IHSS 183 was proposed for NFA status in the 1997 and 2000 Annual Updates to the HRR (DOE 1997, 2000).

IHSS 183 was discussed at the consultative process in NFA Working Group meetings on October 24, 2001 and November 14, 2001. The NFA was verbally agreed to in the November 14, 2001 meeting, provided that the closure plan correspondence from DOE RFFO to CDPHE dated November 9, 1995 (DOE 2002), be submitted in the 2000 Annual Update to the HRR (DOE 2000). This letter was provided as an attachment in Appendix 2 of the 2000 Annual Update to the HRR. The NFA for IHSS 183 was formally approved by CDPHE and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

IHSS 183 overlaps with IHSS 155 (PAC 900-155), which was addressed as a separate action.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 1995, Final Phase I RFI/RI Report 903 Pad, Mound, and East Trenches Area, Operable Unit 2, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1996, Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-184

IHSS Number:	184
Current Operable Unit:	IA
Former Operable Unit:	8
IHSS Group:	900-1
Unit Name:	Radioactive Site Building 991 Steam Cleaning Area

This Final Update to the HRR for PAC 900-184 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 184 is summarized in this update. The following HRR volumes contain IHSS 184 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1952 to 1978

Historical Summary

The location of IHSS 184 is shown on Figure 23. Radioactively contaminated equipment and drums may have been steam cleaned at a location near Building 992 southwest of Building 991. The effluent from the steam-cleaning process was collected in a sump and entered the OPWL system. The steam cleaning may have occurred between 1953 and 1978. IHSS 184 was originally defined as a 50-ft by 50-ft area near Building 992, southwest of Building 991 (DOE 1994). An EPA aerial photograph from August 6, 1971, indicates a darkened area along the dirt road from Building 992. The connection between the darkened area in the photograph and this potential release is not known (DOE 1992). A sitewide radiological survey conducted from 1977 through 1984 did not detect any radioactive hot spots.

IHSS Investigations

Characterization of IHSS 184 was conducted in accordance with IASAP Addendum #IA-03-03 (DOE 2003). Radionuclides, metals, and VOCs were considered COCs for IHSS 184. Analytical results from the characterization sampling of surface and subsurface soil are presented in the Closeout Report for IHSS Group 900-1 (DOE 2004b). Five surface and subsurface soil samples were collected in IHSS 184. Surface soil results indicated uranium-234 and uranium-238 were detected at a maximum activity of 5.218 pCi/g and uranium-235 was detected at a maximum activity of 0.186 pCi/g. A number of metals were detected but all very close to background means plus two standard deviations, except for arsenic which ranged from 12.9 to 14.0 mg/kg. In subsurface soil maximum detections include: uranium-234 at 4.310 pCi/g, uranium-235 at 0.228 pCi/g, uranium-238 at 4.310 pCi/g, arsenic at 13.4 mg/kg, barium at 749 mg/kg, copper at 19.0 mg/kg, strontium at 265.0 mg/kg and vanadium at 221 mg/kg. Ethylbenzene, methylene chloride, and xylene were also detected but at concentrations very close to the RL.
Results indicate all contaminant concentrations and activities were less than RFCA WRW soil ALs (DOE et al. 2003).

No Further Action Recommendation

A recommendation of NFAA is provided in the Closeout Report for IHSS Group 900-1 (DOE 2004b). Based on analytical results and the SSRS, further action was not required and an NFAA determination was justified for IHSS 184, because surface and subsurface contaminant concentrations in soil were less than RFCA WRW ALs.

After review of the Closeout Report by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 184 on March 31, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 900-1 (B991 & 993) - Approval, March 31.

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

DOE, 1994, Operable Unit 8 Phase I RCRA Facility Investigation/Remedial Investigation Work Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-03, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report for IHSS Group 900-1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 900-210

IHSS Number:	210
Current Operable Unit:	IA
Former Operable Unit:	10
IHSS Group:	Not Applicable
Unit Name:	Building 980 Cargo Container, Unit 16

This Final Update to the HRR for PAC 900-210 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 210 is summarized in this update. The following HRR volumes contain IHSS 210 information:

Original Report – 1992 (DOE 1992);
Update Report – 1997 Annual (DOE 1997) ; and
Update Report – 1999 Annual (DOE 1999).

Dates(s) of Operation or Occurrence

1986 to May 1988

Historical Summary

The location of IHSS 210 is shown on Figure 23. IHSS 210, Unit 16 was located southeast of Building 980 and was used for solid and liquid waste drum storage of oil, solvents, and paint waste. The steel cargo container met the requirements of 6 CCR 264.17 for hazardous waste storage (DOE 1992) and was used as a RCRA 90-day accumulation area. The cargo container had an inner catch basin. Steel drums were stored on roller-pallets and had 3-ft aisle spacing. Periodic container inspection was performed. A small area beside the cargo container was enclosed by rope and used for additional storage. Stored material included nonradioactive containerized hazardous waste including automotive oils, solvents, paints, paint thinner, grease, gasoline, diesel fuel, and paper and rags contaminated with oils. These wastes were generated in the Building 980 construction contractor work area (DOE 1992). All hazardous waste was removed from the unit by May 31, 1988 (DOE 1992).

IHSS Investigations

IHSS 210 was studied as part of the OU 10 RFI/RI. As documented in the OU 10 RFI/RI Report (DOE 1995), IHSS 210 was field-screened for radionuclides and VOCs. Nine surface soil locations were sampled and analyzed for SVOCs and metals. Maximum concentrations of detected metals included copper at 76.3 mg/kg and zinc at 311 mg/kg. PAHs were detected at two locations at concentrations equal to or only slightly greater the MDLs.

No Further Action Recommendation

In accordance with the criteria for recommending NFA decisions presented in RFCA (DOE et al. 1996), IHSS 210 was proposed for NFA in the 1997 Annual Update to the HRR (DOE 1997).

DOE received approval from CDPHE (the LRA) and EPA of NFA status for IHSS 210 on July 29, 1999 (CDPHE and EPA 1999).

Comments

None

References

CDPHE and EPA, 1999, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: 1997 Annual Update for the Historical Release Report (September, 1997) July 9.

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

DOE, 1995, Technical Memorandum 1, Operable Unit 10, Other Outside Closures, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-213

IHSS Number:	213
Current Operable Unit:	IA
Former Operable Unit:	10
IHSS Group:	900-3
Unit Name:	904 Pad

This Final Update to the HRR for PAC 900-213 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this IHSS in accordance with the RFCA accelerated action process. The disposition of IHSS 213 is summarized in this update. The following HRR volumes contain IHSS 213 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004).

Dates(s) of Operation or Occurrence

August 1987 to 2003

Historical Summary

The location of IHSS 213 is shown on Figure 23. The 904 Pad was located west of the 903 Pad and south of Central Avenue. It was created in 1987 for the outdoor storage of various waste materials including pondcrete (precipitate from the SEP process treated with cement for stabilization), saltcrete (precipitate from the Building 374 evaporation process treated with cement for stabilization), sewage sludge, and miscellaneous materials in cargo containers. Pondcrete is characterized by high nitrate, and low-level radiation, with traces of VOCs. Saltcrete is made from salts resulting from the Building 374 evaporator and contains a variety of materials (DOE 1992).

The asphalt pad occupied a 129,505-ft^2 rectangular area and was sloped approximately 0.7 percent to the northeast. Improvements to the original design included a 6-inch asphalt berm and tent enclosures. The sludge-like consistency of the pondcrete that resulted in spills prompted the construction of the 6-inch berm to contain runoff, not as a spill containment structure. Because of the berm's inability to handle a 25-year, 24-hour storm, a mobile fuel tanker equipped with pumps was moved to the pad to collect water and transport it to Building 371 for treatment. Water overflow from the pad entered the B-Series Ponds in the South Walnut Creek drainage. Tents were constructed over the entire pad in 1990 (DOE 1992).

Boxes of pondcrete were stacked three high and arranged in groups of 72. Each group was covered with a plastic-lined canvas tarpaulin for weather protection (not completely weatherproof). A passageway was left between stacks for emergency access, inspection, and operations. The tri-walled boxes were designed for transportation rather than long-term storage (DOE 1992).

Several incidents occurred on the pad; however, releases were below reportable quantities. In May, July, and September 1988, a small amount of softened pondcrete spilled from tri-wall boxes. The May 1988 incident involved a spill of approximately 0.25 ft^3 of pondcrete, affecting

an area of 12 ft^2. Saltcrete spilled during two events in June and July 1989 and July and August 1989 (DOE 1992). In response, radiation surveys were performed to determine the level of contamination. Air monitoring indicated plutonium was present at a maximum concentration of 2.5×10^{-4} pCi/m^3 of air for a period in May 1988. Two RCRA Implementation Plans were implemented in response to potential releases to the environment occurring at the 904 Pad. CPIR 88-001 was in response to the May 23, 1988 incident of deformed boxes of pondcrete. CPIR 88-002 was in response to the July 22, 1988 incident of a deformed box (DOE 1992).

In September 1990, a waste box stored on a pallet, located along the western wall of Tent 10, was identified as being radioactively contaminated. The affected box and pallet were bagged and placed in a permacon storage area. Additional smear samples were collected that revealed approximately 15 pallets with high activity levels which were bagged and placed in storage. Contaminated spots on the floor were decontaminated to less than 20 dpm. Procedures were developed to prevent future incidents and identify appropriate action in response to an event (DOE 1992).

Prior to the construction of the tent enclosures, small amounts of leakage under the berm were routinely observed due to inadequate sealing of the berm to the existing asphalt pad. Additionally, the asphalt berms overflowed with runoff during periods of heavy rainfall. Elevated levels of gross alpha activity, gross beta activity, and nitrate were identified in the runoff (DOE 1992).

Soil, water, and air were sampled regularly since the beginning of pad operations. It was determined from the sampling that fill material used to construct the facility was placed over native soil contaminated with radionuclides. The source of the radioactivity was attributed to the adjacent 903 Pad. “Background” soil samples were collected to evaluate nitrate concentrations that were not characteristic of the 903 Pad area.

IHSS 213 was also a RCRA Unit 15. The waste, tents, and pad were removed in 2003 and the RCRA Unit closed (DOE 2003a).

IHSS Investigations

In accordance with IASAP Addendum #IA-03-01 (DOE 2002), 43 surface soil characterization samples were collected and analyzed for radionuclides, metals, VOCs, cyanide, and nitrate. An additional 11 locations were sampled for radionuclides during the accelerated action through the consultative process to specifically investigate fill material under the Pad. Results indicated all COC concentrations were less than RFCA WRW soil ALs (DOE et al. 2003) except for one arsenic value (23.7 mg/kg) in surface soil that slightly exceeded the corresponding WRW soil AL (22.2 mg/kg). Americium-241 was detected 11 percent of the time and when detected ranged from 0.39 to 1.47 pCi/g. Plutonium-239/240, when detected ranged from 2.23 to 8.36 pCi/g. Uranium-235 ranged from nondetect to 0.39 pCi/g and uranium-238 ranged from nondetect to 6.5 pCi/g. Analytical results from the characterization are presented in the Data Summary Report for IHSS Group 900-3 (DOE 2003b).

Based on the analytical results presented in the Data Summary Report, IHSS 213 was proposed for NFAA. All but one of the COC concentrations were less than RFCA WRW soil ALs (DOE et al. 2003). The exception was a single arsenic value (23.7 mg/kg) in surface soil that slightly exceeded the corresponding WRW soil AL (22.2 mg/kg). In addition, there is no identified potential to exceed surface water standards at a POC from this IHSS Group.

No Further Action Recommendation

After review of the Data Summary Report for IHSS Group 900-3 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for IHSS 213 on December 17, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Final Approval, Data Summary Report, IHSS Group 900-3 (904 Pad), December 17.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Closure Summary Report for RCRA Units 15 and 35 Closed in Accordance With RCRA Under the RSOP for Facility Component Removal, Size Reduction, and Decontamination Activities, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2003b, Data Summary Report IHSS Group 900-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: 900-1300

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Reverse Osmosis (RO) Plant Sludge Drying Beds

This Final Update to the HRR for PAC 900-1300 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC-900-1300 is summarized in this update. The following HRR volumes contain PAC 900-1300 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002a).

Dates(s) of Operation or Occurrence

1984 to 1991

Historical Summary

The location of PAC 900-1300 is shown on Figure 23. Two open sludge drying beds (Building 228A and Building 228B) were adjacent to Building 910 and were originally used to store and dry brine from the RO process. After the RO process was discontinued, the beds were used to dry sludge from the STP, Building 995. The sludge was trucked from Building 995 to the Building 910 drying beds. The drying beds were underlain by a sand and gravel filter on native soil. The use of these beds for storing and drying sanitary sewage sludge continued until 1991. Sludge from the sanitary treatment plant was treated as a low-level radioactive waste. Chemical composition of the sludge was monitored regularly (DOE 1992).

PAC Investigations

As part of the PDSR, the drying beds were evaluated and it was determined that contaminant concentrations in the soil inside and outside the drying beds were less than RFCA Tier II soil ALs (DOE 2002b, DOE et al. 1996). Building 910 and associated structures were demolished in 2002.

No Further Action Recommendation

PAC 900-1300 was initially addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. There were very low concentrations of contaminants in the drying beds. Relevant groundwater monitoring information was provided to CDPHE at the December 19, 2001 meeting. After review of the groundwater monitoring information and subsequent discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the April 3, 2002 meeting and was formally approved by CDPHE and EPA in a letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, Pre-Demolition Survey Report (PDSR), Building 910 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-1301

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	900-1
Unit Name:	Building 991 Enclosed Area

This Final Update to the HRR for PAC 900-1301 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1301 is summarized in this update. The following HRR volumes contain PAC 900-1301 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

November 6, 1953 to approximately 1968

Historical Summary

The location of PAC 900-1301 is shown on Figure 23. An enclosed area approximately 50 ft wide along the southern side of Building 991 was used for storage of various radioactively contaminated waste and materials. The earliest document found regarding this area indicated that in November 1953, 79 drums of concreted waste from Building 991 were stored at this PAC. Monthly reports documented no drums were added or removed until January 1961, when the drums were moved to the Mound Area (PAC 900-113) (DOE 1992). These wastes were contaminated with enriched and depleted uranium. No documentation was found that details a release to the environment from these items (DOE 1992).

Other materials were stored in the same general area including shipping crates and carrying cases for assembled weapon components that may have been contaminated (DOE 1992).

PAC Investigations

PAC 900-1301 was characterized in accordance with IASAP Addendum #IA-03-03 (DOE 2003). Surface and subsurface soil samples were collected at three locations in PAC 900-1301 and analyzed for metals and radionuclides. Metals and the uranium isotopes were detected at concentrations or activities greater than background, but less than RFCA WRW soil ALs. In surface soil, uranium-234 was detected a maximum activity of 4.065 pCi/g, uranium-235 was detected at a maximum activity of 0.22 pCi/g, and uranium-238 was detected at a maximum activity of 4.065 pCi/g. Various metals were detected at concentrations close to background means plus two standard deviations. However, strontium was the most abundant metal found in surface soil and ranged from 70 to 293 mg/kg. Maximum activities in subsurface soil include uranium-234 at 3.190 pCi/g, uranium-235 at 0.171 pCi/g, and uranium-238 at 3.19 pCi/g. Again, strontium concentrations were the highest of the detected metals with a maximum value

of 263.0 mg/kg. Analytical results from the characterization sampling are presented in the Closeout Report for IHSS Group 900-1 (DOE 2004b).

No Further Action Recommendation

Based on analytical results and the SSRS, justification for an NFAA status for PAC 900-1301 was provided in the Closeout Report for IHSS Group 900-1 (DOE 2004b).

After review of the Closeout Report by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the NFAA status for PAC 900-1301 on March 31, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 900-1 (B991 & 993) - Approval, March 31.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-03, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report IHSS Group 900-1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

PAC REFERENCE NUMBER: 900-1302

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Gasoline Spill

This Final Update to the HRR for PAC 900-1302 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1302 is summarized in this update. The following HRR volumes contain PAC 900-1302 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

October 5, 1989

Historical Summary

The location of PAC 900-1302 is shown on Figure 23. A 55-gallon drum containing gasoline was discovered leaking in the contractor staging yard south of the 904 Pad. An estimated 2 gallons of gasoline sprayed into the air or leaked onto the ground. HAZMAT responded and sealed the leak. A concrete containment berm was to be installed around the contractor's fuel storage facility as a result of this incident (DOE 1992).

PAC Investigations

No additional investigation was required because the spill was small.

No Further Action Recommendation

PAC 900-1302 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the November 14, 2001 meeting, and was formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-1303

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Natural Gas Leak

This Final Update to the HRR for PAC 900-1303 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1303 is summarized in this update. The following HRR volumes contain PAC 900-1303 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

July 1961 to April 1971

Historical Summary

The location of PAC 900-1303 is shown on Figure 23. A gas leak in the pipeline to Building 995 and Building 991 occurred in July 1961. The leak was apparently present for years and had permeated the ground under the pavement. In April 1971, a major problem with corrosion in the pipeline near Building 991 due to inadequate wrapping was discovered (DOE 1992). The pipe was repaired and 400 ft of gas line near Building 991 was replaced in 1971 (DOE 1992).

PAC Investigations

No additional investigation was required.

No Further Action Recommendation

PAC 900-1303 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the November 14, 2001 meeting, and was formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-1304

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Chromic Acid Spill – Building 991

This Final Update to the HRR for PAC 900-1304 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1304 is summarized in this update. The following HRR volumes contain PAC 900-1304 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

April 22, 1989

Historical Summary

The location of PAC 900-1304 is shown on Figure 23. A portable 500-gallon receiving vessel located outside Building 991, overflowed during a transfer. The portable containers were not equipped with site gages or visible level indicators. The container was being used to transfer liquids generated in the building. Several gallons of chromic acid laboratory waste were spilled into a cement pit. No chemical waste was released because the cement berm functioned as designed. The event occurred on a Saturday and was reported the following Monday. Procedures were reviewed as a result of this incident and steps were taken to prevent its recurrence (DOE 1992).

PAC Investigations

No additional investigation was required because the spill was to a cement berm.

No Further Action Recommendation

PAC 900-1304 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. No waste was released to the environment. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the November 14, 2001 meeting, and was formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-1305

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Building 991 Roof

This Final Update to the HRR for PAC 900-1305 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1305 is summarized in this update. The following HRR volumes contain PAC 900-1305 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

July 1982

Historical Summary

The location of PAC 900-1305 is shown on Figure 23. The roof of Building 991 received a primer coating in July 1982. Approximately 5 gallons of the primer Tremco Tremprime spilled in an area under the intake. The primer contained mineral spirits as a solvent. Fumes from the spill entered an air intake conduit on the roof and affected the climate inside the building. The primer was spread around and dried and the odor diminished (DOE 1992).

PAC Investigations

No additional investigation was required because the spill was to the roof.

No Further Action Recommendation

PAC 900-1305 was addressed through the consultative process in an NFA Working Group meeting on November 14, 2001. The spill was not released to the environment. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the November 14, 2001 meeting, and was formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

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

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-1306

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Transformers 991-1 and 991-2

This Final Update to the HRR for PAC 900-1306 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1306 is summarized in this update. The following HRR volumes contain PAC 900-1306 information:

Original Report – 1992 (DOE 1992);
Update Report – 1996 Annual (DOE 1996); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

Prior to February 1986

Historical Summary

The location of PAC 900-1306 is shown on Figure 23. In February 1986, several leaks were observed on pipe flanges, valves, gages, and bushing compartments of Transformers 991-1 and 991-2. Large amounts of oil were noted on the ground under the two transformers. The oil in Transformers 991-1 and 991-2 contained PCBs at concentrations of 114 and 60 ppm, respectively. The PCBs were cleaned up and the transformers were repaired in February 1986. It is not clear whether the cleanup involved soil (DOE 1992). These transformers were removed in 2004 when Building 991 was demolished.

PAC Investigations

As part of the Sitewide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991 (DOE 1991), soil samples were collected in accordance with approved EPA sampling protocols and analyzed for PCBs using EPA Method 8080. The highest PCB detection in soil samples collected adjacent to the concrete transformer pads was 0.510 ppm.

No Further Action Recommendation

Recently, there has been much toxicological research pertaining to dioxins and other compounds with dioxin-like properties. Although Aroclors (a mixture of PCB congeners) do not contain dioxins, they do contain a few PCB congeners with dioxin-like properties. A White Paper (DOE 2004b) was prepared and submitted to CDPHE that evaluates whether cleanup of PCB-contaminated soil at a transformer site to less than 10 ppm Aroclor is sufficiently protective to render PCB sites NFAA in light of recent studies showing that a few PCB congeners have dioxin-like properties. The evaluation presented in the paper demonstrates that the past cleanup

of the PCB sites at RFETS to achieve Aroclor levels less than 10 ppm, as well as the future cleanup of transformer sites to achieve the WRW AL of 12.4 ppm, adequately protects human health. Although dioxin-like compounds are present in the Aroclors released to soil, the White Paper demonstrates that:

- The health risk posed by the dioxin-like compounds is not a concern at these cleanup levels.
- Weathering of the Aroclors released to the soil is unlikely to significantly alter the congener distribution or the toxicity of the Aroclors.
- Congener-specific PCB analysis of soil samples, or analysis for dioxins and furans, is not required for characterizing transformer sites at RFETS.

Based on the site data and White Paper findings noted above, NFAA status was proposed for PAC 900-1306 in the No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (DOE 2004c).

After review of the White Paper by the regulatory agencies, DOE received approval from CDPHE (the LRA) on the NFAA status for PAC 900-1306 on May 6, 2004 (CDPHE 2004).

Comments

The boundaries of the original location of PAC 900-1306 were estimated. For the 2004 Annual Update to the HRR (DOE 2004a), the boundaries were revised based on sampling location surveys and field reconnaissance.

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: No Further Accelerated Action Justification PCB Potential Areas of Concern (April 15, 2004), May 6.

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

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

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

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Dioxin-Like Compounds in Transformer Oil: An Evaluation of their Potential Impact on Soil Cleanup Strategies at RFETS, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, No Further Accelerated Action Justification for Polychlorinated Biphenyl (PCB) Potential Areas of Concern (PAC) Sites (as proposed in 1996 HRR), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

PAC REFERENCE NUMBER: 900-1307

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	900-1
Unit Name:	Explosive Bonding Pit

This Final Update to the HRR for PAC 900-1307 consolidates the information in the initial 1992 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1307 is summarized in this update. The following HRR volumes contain PAC 900-1307 information:

Original Report – 1992 (DOE 1992);
Update Report – 1999 Annual (DOE 1999); and
Update Report – 2004 Annual (DOE 2004a).

Dates(s) of Operation or Occurrence

1965 to approximately 1968

Historical Summary

The location of PAC 900-1307 is shown on Figure 23. Explosive bonding experiments were conducted at the explosive forming area near Building 993. At least seven events took place within a few days in March 1968 in an experiment to explosively bond together flat plates of stainless steel and uranium alloy. The explosive consisted of 192 g of 40 percent dynamite. The energy released from the dynamite drove the stainless steel plate into the radioactive material to form a bonded laminate. An experiment conducted on March 6, 1968, caused a piece of aluminum used in the experiment to be thrown a distance of 525 ft (DOE 1992).

Other experiments of an unknown nature took place in this general location for at least 2½ years. Until March 1968, experiments took place inside buried, sand-filled, 55-gallon drums. The explosive events took place below grade. Air shocks from the explosions were objectionable to Building 991 occupants until a pit was dug into a hillside near Building 993 to house the apparatus and mitigate air shocks. The 10-ft by 19-ft pit was approximately 4 ft deep (DOE 1992).

Uranium alloy and stainless steel were the materials used in the experiments. No documentation was found that details the physical and chemical characteristics of the constituents that may have been released to the environment (DOE 1992).

PAC Investigations

PAC 900-1307 was characterized as part of IHSS Group 900-1 in accordance with IASAP Addendum #IA-03-03 (DOE 2003). Eleven surface soil samples and one subsurface soil sample beneath the explosive bonding pit were collected and analyzed for radionuclides, metals, and explosives. Metals and uranium isotopes were detected at concentrations or activities greater

than background, but less than RFCA WRW soil ALs (DOE 2004b). The maximum activities detected in surface soil include uranium-234 at 9.016 pCi/g, uranium-235 at 0.329, and uranium-238 at 9.016. Most metals were detected at least once in surface soil at concentrations close to background means plus two standard deviations. The exceptions were strontium detected at a maximum value of 296 mg/kg and copper at a maximum value of 178 mg/kg. In subsurface soil, uranium-234 and uranium-238 were detected at a maximum value of 3.954 pCi/g and uranium-235 was detected at a maximum value of 0.274 pCi/g. Maximum values for metals detected in subsurface soil include arsenic at 19.6 mg/kg, barium at 559 mg/kg, copper at 88.8 mg/kg, vanadium at 174 mg/kg, and zinc at 159 mg/kg. Analytical results from the characterization sampling are presented in the Closeout Report for IHSS Group 900-1 (DOE 2004b).

No Further Action Recommendation

Based on analytical results and the SSRS, justification for an NFAA status for PAC 900-1307 was provided in the Closeout Report for IHSS Group 900-1 (DOE 2004b).

After review of the Closeout Report by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the NFAA status for PAC 900-1307 on March 31, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 900-1 (B991 & 993) - Approval, March 31.

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

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-03, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2004a, Annual Update for Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report IHSS Group 900-1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

PAC REFERENCE NUMBER: 900-1308

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Gasoline Spill Outside of Building 980

This Final Update to the HRR for PAC 900-1308 consolidates the information in the Sixth Quarterly HRR Update and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1308 is summarized in this update. The following HRR volumes contain PAC 900-1308 information:

Original Report – Sixth Quarterly (DOE 1994a);
Update Report – Eighth Quarterly (DOE 1994b);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

November 22, 1993

Historical Summary

The location of PAC 900-1308 is shown on Figure 23. At approximately 6:00 P.M. on November 22, 1993, a garage employee was refueling a security vehicle near the southeastern corner of Building 980 when a gasoline spill occurred. Approximately 0.7 gallon of gasoline were released to a truck bed and the underlying soil when a hose nozzle was inadvertently left on (DOE 1994a).

A spill response was conducted on the same day of the occurrence and all of the wetted soil was excavated and placed into a black and white drum. Documentation of the amount of material removed from the site was not identified.

The soil contents of the black and white drum were determined to be nonradioactive by on-site screening methods and were transported to the Plant garage (Building 331 [UBC 331]) for storage in a satellite collection area (DOE 1994a).

PAC Investigations

No investigation was required because the spill was very small and the soil was removed.

No Further Action Recommendation

Based upon review of the original PAC narrative, a walk-down of the area, the small amount of the spill, and documentation that the spill was physically remediated during spill cleanup, no current or potential contaminant source could be identified for this site (DOE 2001). Accordingly, PAC 900-1308 was proposed for NFA status consistent with RFCA criteria (DOE et al. 1996) in the 2001 Annual Update to the HRR (DOE 2001).

PAC 900-1308 was addressed through the consultative process in an NFA Working Group meeting on December 19, 2001. Based on these discussions, agreement was reached that an NFA was justified. An NFA was verbally agreed to in the December 19, 2001 meeting, and was formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1994a, Sixth Quarterly Update for Historical Release Report, October 1, 1993 to January 1, 1994, Rocky Flats Plant, Golden, Colorado, January.

DOE, 1994b, Eighth Quarterly Update for Historical Release Report, April 1, 1994 to June 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-1309

IHSS Number:	Not Applicable
Current Operable Unit:	BZ
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	OU 2, Field Treatability Unit

This Final Update to the HRR for PAC 900-1309 consolidates the information in the Sixth Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1309 is summarized in this update. The following HRR volumes contain PAC 900-1309 information:

Original Report – Sixth Quarterly (DOE 1994a);
Update Report – Seventh Quarterly (DOE 1994b);
Update Report – Eighth Quarterly (DOE 1994c);
Update Report – 1999 Annual (DOE 1999a); and
Update Report – 2000 Annual (DOE 2000).

Dates(s) of Operation or Occurrence

December 4, 1993

Historical Summary

The location of PAC 900-1309 is shown on Figure 23. Approximately 10 gallons of potentially contaminated water from an influent pipe system leading from Walnut Creek to the OU 2 treatment system were released to the environment. The release was detected when a contractor responded to an alarm indicating the release had occurred. The contractor identified a slow leak coming from a connection in the secondary containment portion of the influent pipeline. The source of the leak was a hole in the primary pipeline that resulted from the separation of two pipes that make up the secondary pipeline. Thirty to 40 gallons of the water were contained by the secondary containment structure. The point of release was located under a road culvert immediately west of the OU 2 treatment system. The 10 gallon release estimate was based on visual observation of a wetted 2 ft by 3 ft soil area (DOE 1994a).

The released influent water was designated as an “F001” listed hazardous waste. The sources of the water being collected for treatment were SW59, SW61, and SW132, which contained mostly surface water runoff from the PA. This water was treated in a Chemical Precipitation/Microfiltration/Granular Activated Carbon system for removal of VOCs, soluble metals, and radioactive constituents before being returned to the creek. The influent water was sampled weekly and the detected contaminants included carbon tetrachloride, methylene chloride, trichloroethene, and tetrachloroethane. Additionally, chromium and 1,2-dichloroethene, chloroform, 1,1-dichloroethane, and 1,1-dichloroethene were detected in the influent water at low levels. Other contaminants that were tested for, but not detected, included acetone, vinyl chloride, barium, cadmium, lead, and mercury (DOE 1999a).

Upon discovery of the leak, the RCRA Contingency Plan was implemented as described in CPIR No. 93-010. The pumps were immediately shut down and the lines were visually inspected for the release. The line was repaired and returned to service on December 8, 1993. The released material was not directly recoverable because it had permeated into the soil.

PAC Investigations

Two risk assessments, an initial one on January 7, 1994, and a second one in March of 1994 using CDPHE methodology (CDPHE 1993), were conducted to evaluate the need for soil remediation. The risk assessments verified the immediate removal of the affected soil was not required, because the contaminant concentrations in the soil did not pose an unacceptable risk to human health and the environment. Risk assessment information is documented in the Sixth (DOE 1994a), Seventh (DOE 1994b), and Eighth (DOE 1994c) Quarterly Updates to the HRR.

Sampling to support characterization of PAC 900-1309 for designation as NFA was conducted in accordance with the SAP for Characterization of Potential No Further Action Sites (DOE 1999b). Surface and subsurface soil samples were collected at two locations within the spill area. Results are presented in Tables 3.16 and 3.17 of the 1999 Annual Update to the HRR (DOE 1999a). Trichlorofluoromethane was detected in one surface soil sample and the corresponding subsurface soil sample at low levels. It is suspected that the chemical is a laboratory-introduced contaminant and is not attributable to the release at PAC 900-1309. Trichlorofluoromethane was detected in other method blanks analyzed by the laboratory and is not a PCOC for the spilled influent (DOE 1999a).

No Further Action Recommendation

PAC 900-1309 was recommended for NFA in the 1999 Annual Update to the HRR based upon the following criteria:

- Trichlorofluoromethane was detected in one surface and corresponding subsurface sample at a concentration of 0.002 mg/kg.
- Although a RFCA AL for trichlorofluoromethane does not exist, the observed concentration is well below the EPA Region III residential RBC of 23,000 mg/kg (EPA 1999).
- Because EPA Region 3 RBCs are based on similar assumptions as RFCA ALs, a contaminant source was not identified for PAC 900-1309 in accordance with RFCA (DOE et al. 1996).

After review of the 1999 Annual Update to the HRR by the regulatory agencies, DOE received approval from CDPHE and EPA (the LRA) of the NFA status for PAC 900-1309 on June 23, 2000 (CDPHE and EPA 2000).

Comments

None

References

CDPHE, 2003, Interim Final Policy and Guidance on Risk Assessments for Corrective Action at RCRA Facilities, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

CDPHE and EPA, 2000, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA Region VIII, RE: Annual Update for the Historical Release Report (September 1999), Colorado, June 23.

DOE, 1994a, Sixth Quarterly Update for Historical Release Report, October 1, 1993 to January 1, 1994, Rocky Flats Plant, Golden, Colorado, January.

DOE, 1994b, Seventh Quarterly Update for Historical Release Report, January 1, 1994 to March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1994c, Eighth Quarterly Update for Historical Release Report, April 1, 1994 to June 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 1999a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999b, Sampling and Analysis Plan for Characterization of Potential No Further Action Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

EPA, 1999, EPA Region III Risk-based Concentration Table, April.

PAC REFERENCE NUMBER: 900-1310

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	000-1
Unit Name:	ITS Water Spill (formerly 000-502)

This Final Update to the HRR for PAC 900-1310 consolidates the information in the Second Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1310 is summarized in this update. The following HRR volumes contain PAC 900-1310 information:

Original Report – Second Quarterly (DOE 1993a);
Update Report – Third Quarterly (DOE 1993b);
Update Report – Seventh Quarterly (DOE 1994);
Update Report – 2000 Annual (DOE 2000); and
Update Report – 2003 Annual (DOE 2003a).

Dates(s) of Operation or Occurrence

November 30, 1992

Historical Summary

The location of PAC 900-1310 is shown on Figure 23. A release of approximately 490 gallons of interceptor trench water was reported at 1:45 A.M. on November 30, 1992. CDH and EPA were notified that the RCRA Contingency Plan was implemented. Surface water runoff and potentially contaminated groundwater were collected in the SEP Interceptor Trench Pump House (ITPH) system prior to being pumped from a centralized sump into SEP Pond 207B North. The release originated from a separation of a pipe coupling in the 3-inch transfer line on the eastern slope of the SEP Pond 207B North berm and flowed onto the surrounding soil.

The 3 ft section of drain hose that was connected to the end of the inlet pipe to Pond 207B North had frozen during several days of subzero weather and caused back pressure in the pipe when the interceptor central sump began to pump water into the pond.

The interceptor trench water was managed as RCRA-regulated hazardous waste because the groundwater had the potential to contain RCRA-regulated hazardous constituents, and because of the possibility of releases from the SEP. Previous analytical testing indicated that listed hazardous waste constituents were detected in the interceptor trench water. The material in the SEP was characterized as RCRA-regulated waste with the following EPA waste codes: D006, F001, F002, F003, F005, F006, F007, and F009. A sample of the water was collected on November 30, 1992 and results indicated volatiles were comparable to previous analytical results for this waste stream. The pipe connection was repaired and the system was placed back into service. The released material was not directly recoverable because it had permeated into the soil. Because of the location of the release (upgradient of the ITPH system in an area previously

identified as possibly contaminated by past releases from the proximal SEP) no action was taken to immediately recover the material.

The ITS water collection and pumping ceased when the Solar Pond Plume groundwater barrier system was installed in 1999 (DOE 1999).

PAC Investigations

PAC 900-1310 was characterized as part of IHSS Group 000-1 in accordance with IASAP Addendum #IA-02-07 (DOE 2002). Characterization activities were executed between August 6, 2002 and November 20, 2002. Six surface soil samples were collected at PAC 900-1310. Samples were analyzed for radionuclides, metals, and nitrate. Arsenic was detected at concentrations greater than RFCA Tier II soil ALs (DOE et al. 1996) but less than background means plus two standard deviations. Arsenic was detected at concentrations ranging from 10 mg/kg to 17 mg/kg.

No Further Action Recommendation

Based on the characterization analytical results that indicated all analyte concentrations were less than RFCA Tier II soil ALs, with the exception of arsenic, which was less than background, and accelerated action activities, an NFAA was justified in the Closeout Report for IHSS Group 000-1 (DOE 2003b) for PAC 900-1310. CDPHE (the LRA) and EPA approved the NFAA designation on July 25, 2003 (CDPHE and EPA 2003).

Comments

This PAC was formerly identified as PAC 000-502 - Hillside Spill North of Solar Evaporation Pond 207B North in the Second Quarterly Update to the HRR (DOE 1993a). Based upon further investigation, this PAC was more accurately located within the 900 Area in the Seventh Quarterly Update to the HRR (DOE 1994) and was renamed ITS Water Spill

References

CDPHE and EPA, 2003, Correspondence to J. Legare, DOE RFFO from S. Gunderson, CDPHE and T. Rehder, EPA, RE: Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, July 25.

DOE, 1993a, Second Quarterly Update for Historical Release Report, October 1, 1992 to January 1, 1993, Rocky Flats Plant, Golden, Colorado, January.

DOE, 1993b, Third Quarterly Update for Historical Release Report, January 1, 1993 to April 1, 1993, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1994, Seventh Quarterly Update for Historical Release Report, January 1, 1994 to March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1999, Final Solar Ponds Plume Decision Document, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-07, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-1311

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Septic Tank East of Building 991

This Final Update to the HRR for PAC 900-1311 consolidates the information in the Seventh Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1311 is summarized in this update. The following HRR volumes contain PAC 900-1311 information:

Original Report – Seventh Quarterly (DOE 1994);
Update Report – 1999 Annual (DOE 1999a);
Update Report – 2000 Annual (DOE 2000);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

1952

Historical Summary

The location of PAC 900-1311 is shown on Figure 23. A sewage-related structure existed east of Building 991 during 1952 (DOE 1994). This structure is referred to in several documents by a variety of names including “temporary sewage disposal bed,” “sewerage test area,” septic tank, and wooden septic tank (DOE 1994). The location of the septic tank has been variously described in the HRR, however, the current location is considered accurate (DOE 2000).

In 1952 a brownish, odorous liquid flowing from a roughly 4-inch diameter metal pipe into the wooden structure was reported during construction of the tank. The fluid was thought to have been sewage and was expected to have been contaminated with radionuclides (DOE 1994).

A wooden flume is believed to have transported the sewage effluent from the waste disposal plant's septic tank to a ditch that discharged to a pond east of Building 991 before uncontrolled release of the effluent to South Walnut Creek. Effluent was described as clear, white, and odorless. The ditch above the discharge was dry and the ditch below the discharge contained a considerable amount of green algae. No odor was noticed at the septic tank, discharge, or ditch (DOE 1994).

In September, 1952 the effluent from the Building 991 was sampled at two points: the flume coming out of the septic tank near Building 995 and the first pond just below the septic tank. Test results showed 11 ppm of dissolved oxygen. On September 25, 26, and 29, 1952, visual effluent samples taken from the septic tank were clear with no odor (DOE 1994).

No documentation was identified which noted the termination of usage or removal of the septic tank; however, the Building 995 activated sewage sludge treatment system may have replaced the use of this tank in 1953 (DOE 1994).

PAC Investigations

During preparation of the SAP for Characterization of Potential No Further Action Sites (DOE 1999b), it became apparent that the location of PAC 900-1311 as identified in the HRR Seventh Quarterly Update (DOE 1994) was not accurate. Based on the original PAC description and as described above, the flume was located across South Walnut Creek and upgradient by several hundred feet. This location was not consistent or logical with the original description. Based upon this finding, PAC 900-1311 was relocated to its probable location and documented in the 2000 Annual Update to the HRR (DOE 2000). Although the exact location could not be positively identified, the area chosen for sampling lies within a topographical low that should reflect any elevated concentrations of contaminants because surficial contamination would likely migrate through this low area before leaving through a culvert (DOE 1999b).

Sampling at PAC 900-1311 was conducted in accordance with the SAP for Characterization of Potential No Further Action Sites (DOE 1999b). Four surface soil samples were collected from a depth of zero to six inches and analyzed for SVOCs, pesticides/PCBs, metals, and isotopic radionuclides. Four shallow subsurface composite soil samples were also collected from a depth of 6 inches to a depth of 2 ft to evaluate the potential vertical distribution of these contaminants. Results of the analyses are summarized in Tables 2.7 and 2.8 of the 2000 Annual Update to the HRR, along with the appropriate RFCA ALs for soil. All of the analytical results are presented in the NFA Justification Document for incorporation into the HRR for PACs NW-1501, NE-1408, NE-1409, 900-1309, 900-1311, 900-1312, 900-1313 (DOE 1999a).

PCOCs identified at PAC 900-1311 were not detected at levels exceeding RFCA Tier I and Tier II soil ALs (DOE et al. 1996). For those PCOCs without a corresponding ALs, the EPA Region 3 RBC table was reviewed. Of those contaminants (carbazole, 2-methylnapthalene, and benzo(g,h,i)perylene), carbazole had a RBC of 290.0 mg/kg (DOE 1999a). The detected concentrations were less than the RBC. The laboratory results for four SVOCs, carbazole, 2-methylnapthalene, benzo(g,h,i)perylene, and phenanthrene, are qualified as estimated values, less than the detection limit.

No Further Action Recommendation

PAC 900-1311 was addressed through the consultative process in NFA Working Group meetings on October 14, 2001 and November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified for PAC 900-1311, because investigations did not identify any evidence of a release associated with this PAC. An NFA was verbally agreed to in the November 14, 2001 meeting, and formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1994, Seventh Quarterly Update for Historical Release Report, January 1, 1994 to March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1999a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999b, Sampling and Analysis Plan for Characterization of Potential No Further Action Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-1312

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	OU 2 Water Spill

This Final Update to the HRR for PAC 900-1312 consolidates the information in the Seventh Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1312 is summarized in this update. The following HRR volumes contain PAC 900-1312 information:

Original Report – Seventh Quarterly (DOE 1994a);
Update Report – 1999 Annual (DOE 1999); and
Update Report – 2000 Annual (DOE 2000).

Dates(s) of Operation or Occurrence

March 10, 1994

Historical Summary

The location of PAC 900-1312 is shown on Figure 23. As part of the OU 2 IM/IRA (DOE 1994b) activities at OU 2, surface water was collected at surface water stations SW59, SW61, and SW132, transferred through a pipeline, and treated at the OU 2 treatment facility (Building 891). As a result of separation in the primary and secondary piping associated with the transfer line, approximately 200 gallons of surface water potentially containing hazardous waste constituents were released to the environment. The pipeline was visually inspected eight hours prior to the discovery of the release. The leak was discovered when the influent flow totalizer meter showed a marked decrease in the amount of water entering the system and the operator proceeded to visually inspect the pipeline. The primary and secondary piping were found to be separated approximately 800 ft from the treatment unit, approximately 200 ft above the SW-61 collection point. The amount of liquid released to the soil was estimated to be 200 gallons based on a visual determination of the size of the wetted area. In addition, possibly up to 6,000 gallons may have been released from the primary piping, flowed through the secondary piping and returned to the SW-61 collection point. Approximately 97 percent of the water diverted to the treatment system was collected from SW61 (DOE 1994a).

None of the estimated 6,000 gallons which flowed back into the creek was recovered; however, the water returned to Walnut Creek was essentially indistinguishable from the periodic overflows of the water which exceed the 60 gpm treatment requirements of the OU 2 treatment unit (DOE 1994a).

The water that was released was collected from SW59, SW61, and SW132 (most of which is surface runoff from the PA). Analytical results from sampling events of the influent water from May 1993 and March 1994 are summarized in Table 3.22 of the 2000 Annual Update to the HRR

(DOE 2000). Based on these historical data, contaminants that have been detected include carbon tetrachloride, trichloroethene, and tetrachloroethane. Cis-1,2-dichloroethene, chloroform, 1,1-dichloroethene, and toluene have also been detected in the influent water but not at levels that constitute characteristic hazardous waste (DOE 1994a).

The operator immediately shut down the inlet pumps to the pipeline and the RCRA Contingency Plan was implemented. Samples were collected of the influent water and the soil in the area affected by the release. The pumps were de-energized after the leak was discovered and personnel immediately began repairs on the pipe. The system was back in normal operation within six hours of discovery of the leak (DOE 1994a).

PAC Investigations

The surface soil affected by the release was sampled on March 10, 1994, in two locations and analyzed for VOCs and radionuclides. The results for analytes detected above background are summarized in Table 3.23 of the 1999 Annual Update to the HRR (DOE 1999). Americium-241 was detected at activities ranging from 0.86 to 0.92 pCi/g and plutonium-239/240 was detected at activities ranging from 1.5 to 2.5 pCi/g. 2-Butone was detected at concentrations ranging from 4 to 5 μg/kg and tetrachloroethane was detected at concentrations ranging from 2 to 3.3 μg/kg. None of the listed analytes were detected above RFCA Tier II soil ALs (DOE et al. 1996).

Based on historical analyses of influent water and the previous risk calculations, a decision was made on March 10, 1994, to not immediately remove the soil impacted by the release. This decision was validated through risk calculations (CDPHE Methodology [CDPHE 1993]), which resulted in a cancer risk of 10^{-7} to 10^{-8} (DOE 1994a).

No Further Action Recommendation

Based on the results of the soil samples collected at the time of the incident, a contaminant source was not identified. Therefore, in accordance with RFCA (DOE et al. 1996), PAC 900-1312 was recommended for NFA in the 1999 Annual Update to the HRR (DOE 1999).

DOE received approval from CDPHE (the LRA) and EPA of NFA status for PAC 900-1312 on June 23, 2000 (CDPHE and EPA 2000).

Comments

None

References

CDPHE, 1993, Interim Final Policy and Guidance on Risk Assessments for Corrective Action at RCRA Facilities, November.

CDPHE and EPA, 2000, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA Region VIII, RE: Annual Update for the Historical Release Report (September 1999), Colorado, June 23.

DOE, 1994a, Seventh Quarterly Update for Historical Release Report, January 1, 1994 to March 31, 1994, Rocky Flats Plant, Golden, Colorado, April.

DOE, 1994b, OU 2 Subsurface IM/IRA Site No. 1, Soil Vapor Extraction Pilot Test Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-1313

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Seep Area Near OU 2 Influent Piping

This Final Update to the HRR for PAC 900-1313 consolidates the information in the Ninth Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1313 is summarized in this update. The following HRR volumes contain PAC 900-1313 information:

Original Report – Ninth Quarterly (DOE 1994);
Update Report – 1999 Annual (DOE 1999a); and
Update Report – 2000 Annual (DOE 2000).

Dates(s) of Operation or Occurrence

March 18, 1994

Historical Summary

The location of PAC 900-1313 is shown on Figure 23. At approximately 2:00 P.M. on March 18, 1994, 2 - 3 gallons of a glossy liquid substance were noticed collecting in a stagnant pool within the Walnut Creek bed approximately 10 ft downstream from the OU 2 water treatment facility. Samples were collected by both Plant and CDPHE personnel on March 18, 1994. Additional samples were collected by Plant personnel on March 24, April 7, and October 25, 1994. The stagnant appearance of the pool and the glossy sheen observed on the surface were determined to be from anaerobic degradation typical of stagnant pond environments; however, validated results from all but the October sampling event indicated elevated levels of vinyl chloride and other VOCs (see Table 3.24 in the 1999 Annual Update to the HRR [DOE 1999a]). Vinyl chloride is not a COC identified in the influent waters pumped to the OU 2 water treatment facility but may be a degradation product (DOE 1994).

PAC Investigations

Sampling to support characterization of IHSS 192 for possible designation as NFA was conducted in accordance with the SAP for Characterization of Potential No Further Action Sites (DOE 1999b). Two surface sediment and two subsurface sediment samples were collected at the location of the seep to verify the adequacy of the previous response action and to further characterize the potential for residual contaminants. The samples were analyzed for VOCs and radionuclides. Americium-241 was detected at activities ranging from 0.299 to 0.5 pCi/g, plutonium-239/240 was detected at activities ranging from 0.165 to 0.352 pCi/g, and uranium-235 was detected at activities ranging from 0.0247 to 0.107 pCi/g. Acetone was detected at concentrations ranging from nondetection to 69 μg/kg. All potential COCs were less than RFCA Tier I and Tier II soil ALs (DOE et al. 1996). Results of the analyses are summarized

in Tables 3.25 and 3.26 of the 1999 Annual Update to the HRR (DOE 1999a). All of the analytical results are presented in the NFA Justification Document for incorporation into the HRR for PACs NW-1501, NE-1408, NE-1409, 900-1309, 900-1311, 900-1312, and 900-1313 (DOE 1999a).

No Further Action Recommendation

Based on the results of the sediment samples collected, a contaminant source was not identified for IHSS 192. In accordance with RFCA (DOE et al. 1996), IHSS 192 was recommended for NFA in the 1999 Annual Update to the HRR (DOE 1999a).

DOE received approval from CDPHE (the LRA) and EPA of NFA status for IHSS 192 on June 23, 2000 (CDPHE and EPA 2000).

Comments

None

References

CDPHE and EPA, 2000, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, and T. Rehder, EPA Region VIII, RE: Annual Update for the Historical Release Report (September 1999), Colorado, June 23.

DOE, 1994, Ninth Quarterly Update for Historical Release Report, July 1, 1994 to September 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1999a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999b, Sampling and Analysis Plan for Characterization of Potential No Further Action Sites, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

PAC REFERENCE NUMBER: 900-1314

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Solar Evaporation Pond 297B Sludge Release

This Final Update to the HRR for PAC 900-1314 consolidates the information in the Ninth Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1314 is summarized in this update. The following HRR volumes contain PAC 900-1314 information:

Original Report – Ninth Quarterly (DOE 1994); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

August 8, 1994

Historical Summary

The location of PAC 900-1314 is shown on Figure 23. During sludge vacuuming operations at SEP 207B South, approximately 1 quart of hazardous waste was released to the soil along the east berm of the pond. The release occurred when a damaged latching mechanism on the side door of the vacuum truck did not properly seal. Operations were immediately suspended, a catch pan was placed under the leaking door, and the collected liquid was vacuumed up and transferred to RCRA-permitted storage tanks. The affected soil was removed and placed into a 55-gallon drum to be managed as a RCRA-regulated hazardous waste.

The material released from the vacuum tanker was SEP water and sludge. EPA waste codes assigned to SEP sludge and water include: F001, F002, F003, F005, F006, F007, F009, and D006.

Samples of the remaining soil were collected to ensure that all contaminated soils were adequately cleaned up (DOE 1994). No documentation was found for the results of any analyses performed on the samples.

PAC Investigations

No investigation was required because the soil was removed.

No Further Action Recommendation

Based on the documented clean-up of the spill immediately after it occurred, PAC 900-1314 was recommended for NFA in the Ninth Quarterly Update to the HRR (DOE 1994).

PAC 900-1314 was addressed through the consultative process in NFA Working Group meetings. DOE received approval from CDPHE (the LRA) and EPA of NFA status for PAC 900-1314 on September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1994, Ninth Quarterly Update for Historical Release Report, July 1, 1994 to September 30, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-1315

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Tanker Truck Release on East Patrol Road, North of Spruce Ave.

This Final Update to the HRR for PAC 900-1315 consolidates the information in the Tenth Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1315 is summarized in this update. The following HRR volumes contain PAC 900-1315 information:

Original Report – Tenth Quarterly (DOE 1995a);
Update Report – Eleventh Quarterly (DOE 1995b); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

December 13, 1994

Historical Summary

The location of PAC 900-1315 is shown on Figure 23. At approximately 11:40 A.M., December 13, 1994, during transport operations of SEP decant waste water, approximately 10 gallons of hazardous waste was released. A tanker truck was transporting the decant water from the 750 Storage Pad (PAC 700-214 [RCRA Unit 25]) where SEP sludges were separated through a settling process to Building 374 feed storage tanks (Tanks 231 A and B). The vent/blow-down valve was inadvertently left open during the filling process. It was estimated that approximately 10 gallons of hazardous waste was released to the asphalt and soil. The released liquid contacted two sections of asphalt road surface and one section of soil (approximately 1 ft by 100 ft). The release to asphalt was north of Spruce Avenue on the East Patrol Road. Soil was contaminated in an area just northeast of Building 964. Soil samples were collected from an area northeast of Building 964 on December 13, 1994.

Historical records document that the SEPs frequently received untreated process waste as well as treated process waste and contaminated scrap metals. EPA waste codes assigned to the sludge and decant water were determined from historical characterization records and included: F001, F002, F003, F005, F006, F007, F009, and F039.

PAC Investigations

Upon discovery of the release, surveys were conducted. The vent/blow-down valve was closed to prevent further release of the decant water and decontamination procedures began immediately to remediate the spilled liquid both on the tanker and asphalt surfaces. A triple rinse was performed on the asphalt surfaces using a detergent solution followed by Wet-Vac vacuum procedures. The decant liquid spilled on the soil was excavated to a depth of 2 inches (until no

evidence of wetted soil could be seen) and containerized in wooden crates. Approximately 4,560 lbs of soil were removed and managed as RCRA-regulated hazardous waste at RCRA Unit 25 (750 Pad [PAC 700-214]). Two surface soil samples were collected from the area on December 13, 1994. One composite soil sample was collected after the wetted soil was containerized to verify that adequate cleanup was performed and another was collected adjacent to the spill area to determine if any pre-existing contamination was present because of the close proximity of PAC 900-165. In addition, samples of decant water were collected from the tanker. Analytical results are presented in Tables 1 and 2 of the Eleventh Quarterly Update to the HRR (DOE 1995). Based on TCLP analysis, cadmium was detected in soil from 0.014 to 0.047 mg/kg and chromium was detected from 0.005 to 0.008 mg/kg. All VOCs concentrations were less than the detection limit.

No Further Action Recommendation

Because of the condition of the soil (that is, hard packed) and the prompt removal of liquid and wetted soil, hazards to human health or the environment were mitigated. The pH of the liquid released was 9.14. Based on the results of the samples collected of the soil remaining in the wetted area after the contaminated soil was removed, the concentrations of contaminants in the remaining soil were either below the analytical detection limits or equal to the concentrations in the adjacent soil; therefore, no further remedial actions were required.

Based upon cleanup documentation, validated analytical data, and radiological surveys of the area, PAC 900-1315 was recommended for NFA in the Eleventh Quarterly Update to the HRR (DOE 1995b).

DOE received approval from CDPHE (the LRA) and EPA of NFA status for PAC 900-1315 on September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1995a, Tenth Quarterly Update for Historical Release Report, September 30, 1994 to December 31, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 1995b, Eleventh Quarterly Update for Historical Release Report, January 1, 1995 to March 31, 1995, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-1316

IHSS Number:	Not Applicable
Current Operable Unit:	BZ
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Elevated Chromium (total) Identified during Geotechnical Drilling

This Final Update to the HRR for PAC 900-1316 consolidates the information in the Tenth Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1316 is summarized in this update. The following HRR volumes contain PAC 900-1316 information:

Original Report – Tenth Quarterly (DOE 1995); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

August 24, 1994

Historical Summary

The location of PAC 900-1316 is shown on Figure 23. On August 24, 1994, while conducting geotechnical drilling prior to construction of a storage facility at the Field Operations Yard located south and west of the 904 Pad (PAC 900-213), chromium (total) was detected in the drummed cuttings at 106 mg/kg and 120 mg/kg, indicating the chromium concentrations may have been greater than the RCRA D007 characteristic hazardous waste value.

Historically, the Field Operations Yard (formerly called the contractor's yard) was used to store miscellaneous equipment, discard scrap metal, stockpile gravel for construction use, and deposit spoils from excavation projects.

PAC Investigations

Upon receipt of the data, further investigation was initiated to identify the potential source of the chromium anomaly. Additional sampling was conducted on September 28, 1994, from six study pits excavated to a depth of 6 ft along the eastern perimeter of the proposed building foundation. Analytical results indicated chromium levels below or at background. On October 19, 1994, one additional borehole was drilled approximately 18 ft northwest of the southwestern corner of the proposed building. Analytical results from this borehole detected chromium (total) at 138 ppm and 347 ppm from two depth-integrated composite sample intervals collected between 6 and 8 ft and 10½ and 14 ft, respectively. VOCs were not detected in any of the sampling events (DOE 1995).

A risk assessment screen (RAS) using all available data was completed on January 17, 1995. Analytical data are included in Tables 1, 2, and 3 of the RAS, which is provided as a supplementary attachment to the PAC 900-1316 write-up in the Tenth Quarterly Update to the HRR (DOE 1995).

TCLP analysis for metals collected from the area of the highest chromium concentration (347 ppm at 10½ - 14 ft) indicated that soil from the chromium anomaly did not readily leach and the anomaly did not pose an unreasonable risk to human health or the environment (DOE 1995).

No Further Action Recommendation

Based on calculated risk results from the RAS completed January 17, 1995, and TCLP analytical data indicating that the chromium did not readily leach, PAC 900-1316 was recommended for NFA in the Tenth Quarterly Update to the HRR (DOE 1995).

DOE received approval from CDPHE and EPA (the LRA) of NFA status for PAC 900-1316 on September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1995, Tenth Quarterly Update for Historical Release Report, September 30, 1994 to December 31, 1994, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-1317

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Soil Release from Wooden Crate in 964 Laydown Yard

This Final Update to the HRR for PAC 900-1317 consolidates the information in the Eleventh Quarterly HRR Update and subsequent updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1317 is summarized in this update. The following HRR volumes contain PAC 900-1317 information:

Original Report – Eleventh Quarterly (DOE 1995); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

January 18, 1995

Historical Summary

The location of PAC 900-1317 is shown on Figure 23. At approximately 6:00 P.M. on January 18, 1995, carpenters were attempting to reattach a lid from a wooden half crate located south of Building 964 and within PAC 900-176. The lid was believed to have blown off the previous day during a period of high winds. While working on the crate, one of the structural sides fell apart, inadvertently exposing the plastic liner and releasing approximately 1 lb of coarse gravel and residual soil material to the ground. The only information available regarding the origin of the crate contents were the words “oil and soil” handwritten on the plastic liner. The half crate associated with this release and another half crate staged adjacent to it were apparently placed within a RCA because of the unknown nature of the contents as part of an accelerated cleanup project. There were no identifying markings on either crate except for the dates of manufacture of 1989 and 1990. Approximately 1 lb of coarse gravel (<1/2 inch diameter) and residual soil was released to the ground (DOE 1995).

At the time the release occurred, IHSS 176 (the 964 Laydown Yard) was being investigated as part of OU 10.

PAC Investigations

Once the release was identified, a tarp was placed over the open crate and weighed down with rocks until the spilled soil and gravel could be placed back into the crate. On January 19, 1995, the spilled material was cleaned up and samples were collected from the area of the release to complete a waste determination and provide cleanup verification. Additional collection of samples from the crate was required on January 24, 1995, because an insufficient amount of actual soil was collected in the first sampling event (the release was comprised of mostly gravel) (DOE 1995).

Analytical results for the soil and gravel in the area of the release indicated VOCs such as acetone and methyl ethyl ketone (MEK) were detected in the low ppb ranges for samples collected in the spill area but not detected in samples collected from within the crates. These organic compounds were detected well below the practical quantitation limits (PQLs) of the laboratory equipment and are commonly seen as laboratory contaminants. Radiological analyses indicated low-level radiological contamination (9.1 pCi/g plutonium-239/240) (DOE 1995).

A RCRA 90-day storage area was immediately established at the release site until a waste determination could be made. On March 1, 1995, a waste determination concluded that the released material was nonhazardous; however, because of low-level radiological contamination, the crates were scheduled to be re-packaged as nonhazardous LLW and transferred to Building 664 for storage (DOE 1995).

No Further Action Recommendation

Based on the small amount of material (1 lb or less) released to the environment, the immediate cleanup response, analytical data indicating the spilled material was nonhazardous, and that IHSS 176 was then under investigation for VOC, inorganic, and radiological contamination, PAC 900-1317 was recommended for NFA in the Eleventh Quarterly Update to the HRR (DOE 1995). DOE received approval from CDPHE (the LRA) and EPA of NFA status for PAC 900-1317 on September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

DOE, 1995, Eleventh Quarterly Update for Historical Release Report, January 1, 1995 to March 31, 1995, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PAC REFERENCE NUMBER: 900-1318

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	Not Applicable
Unit Name:	Release of F001 Listed Waste Water to Soil

This Final Update to the HRR for PAC 900-1318 consolidates the information in the 1997 HRR and subsequent HRR updates with information gained through the disposition of this PAC in accordance with the RFCA accelerated action process. The disposition of PAC 900-1318 is summarized in this update. The following HRR volumes contain PAC 900-1318 information:

Original Report – 1997 Annual (DOE 1997);
Update Report – 1998 Annual (DOE 1998);
Update Report – 2000 Annual (DOE 2000);
Update Report – 2001 Annual (DOE 2001); and
Update Report – 2002 Annual (DOE 2002).

Dates(s) of Operation or Occurrence

October 7, 1996

Historical Summary

The location of PAC 900-1318 is shown on Figure 23. On October 7, 1996, at approximately 10:00 A.M., workers discovered a small amount of waste water leaking from a level-indicating valve associated with the SW059 collection tank. The valve was positioned on the northern side of the tank and the estimated volume of water (which contained F001-listed RCRA constituents) reaching the soil was approximately 1 pint. The fitting was tightened immediately which stopped the leak and the area was monitored for VOCs during remediation of the soil (DOE 1996). Historical characterization of the SW059 seep water indicated elevated levels of the following VOCs: carbon tetrachloride, chloroform, tetrachloroethane, and trichloroethene (DOE 2000). SW059 no longer exists because of Functional Channel 4.

PAC Investigations

The spill area was contained after the area was monitored for VOCs. Approximately one 55-gallon drum of soil was removed and transported to a RCRA Hazardous Waste Management Unit (RCRA Unit No.18.03) after radiological screening was performed. A surface soil confirmation sample was collected to verify that the spill was cleaned up and a RCRA CPIR was filed (DOE 1996). Sample results confirmed that no current or potential source of contamination existed at the spill location. Results are tabulated in CPIR Report 1996-0011, which is provided as an attachment to the PAC 900-1318 narrative in the 2000 Annual Update to the HRR (DOE 2000). Results indicated that while acetone (5 μg/kg), 2-butanone (3 μg/kg) and tetrachloroethane (2 μg/kg) were detected, all were estimated and acetone and 2-butanone were also found in laboratory blanks.

No Further Action Recommendation

Based on the small amount of material released to the environment, the immediate remedial response, and the cleanup confirmation sample showing that the release was adequately cleaned up, PAC 900-1318 was proposed for NFA consistent with RFCA (DOE et al. 1996) in the 2000 Annual Update to the HRR (DOE 2000).

The PAC 900-1318 NFA was addressed through the consultative process in NFA Working Group meetings on October 14, 2001 and on November 14, 2001. Based on these discussions, agreement was reached that an NFA was justified for PAC 900-1318, because no current or potential source of contamination was associated with this PAC. An NFA was verbally agreed to in the November 14, 2001 meeting, and formally approved by CDPHE (the LRA) and EPA in a letter dated February 14, 2002 (CDPHE and EPA 2002).

Comments

This PAC was inadvertently numbered as 900-1307 in the 1997 Annual Update to the HRR (DOE 1997). The PAC reference number was corrected as PAC 900-1318 in the 1998 Annual Update to the HRR (DOE 1998).

The location where the spill occurred was physically removed during the installation of the Mound Plume Treatment System collection trench in 1997.

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, RE: Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1996, Occurrence Report (RFO-KHLL-ENVOPS-1996-0011), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

UBCs

Figure 24
HRR UBCs

PAC REFERENCE NUMBER: UBC 122

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	100-1
Unit Name:	Medical Facility

This Final Update to the HRR for UBC 122 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. This Final Update to the HRR for UBC 122 summarizes the disposition of the UBC. The following HRR volume contains UBC 122 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1953 to 2003

Historical Summary

The location of UBC 122 is shown on Figure 24. Building 122 housed the on-site medical facilities and the occupational health and internal dosimetry organizations. Emergency medical services, diagnosis, decontamination, first aid, x-ray, minor surgical treatment, and ambulatory activities were conducted in this building. The building also contained clinical facilities to support routine employee and subcontractor physical examinations. Lung counting, to measure radioactive material in the lung, was also conducted. The facility contained three general areas: administration, internal dosimetry, and medical/health.

Building 122 went into service in 1953. Major additions were made in 1967, 1969, and 1989. Other smaller additions and internal modifications were also made during the building's service life. The building was demolished during 2004 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the D&D Closeout Report (DOE 2004a). The demolition included the removal of the building slab and all in-ground waste lines and other building components.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building. However, very few chemicals were used in Building 122, and only small volumes of chemical wastes were generated (DOE 2004b). Chemicals used in Building 122 were principally related to development of x-ray film (for example, fixers and developers) and decontamination of workers (for example, water, Clorox, soap, and hydrogen peroxide). Fixers and developers consisted of inorganic chemicals, including silver. Developers and associated water were discharged into the sanitary sewer system. Decontamination fluids originally drained

to Tank T-1, an 800-gallon stainless steel storage tank. When the tank was full, waste was pumped out to a tank truck and then discharged to the OPWL system. Waste included trace radionuclides, bleach, soap, blood, and hydrogen peroxide. The tank was removed in January 1984, after the building was connected to the NPWL system. Tank T-1 is addressed under IHSS 000-121 in this Final Update to the HRR.

UBC Investigation

UBC 122 was characterized as part of IHSS Group 100-1 (October 12 to 14, 2004) in accordance with IASAP Addendum #IA-04-04 (DOE 2003). Surface and subsurface soil samples were collected from six sampling locations under the Building 122 slab (DOE 2004b). COCs included radionuclides and metals. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003), with one exception. The arsenic concentration at sampling location BT39-007 (at 2.5 – 4.5 ft bgs) was 25.0 mg/kg, and the WRW soil AL is 22.2 mg/kg. Based on the SSRS, no soil removal from under the building was required. The area is not susceptible to significant erosion. Other metal concentrations were less than 10 percent of the WRW soil ALs. The highest uranium activities above background, which occurred in subsurface soil, are as follows:

- Uranium-234 was detected at 4.28 pCi/g where the WRW AL is 300 pCi/g.
- Uranium-235 was detected at 0.25 pCi/g where the WRW AL is 8 pCi/g.
- Uranium-238 was detected at 4.28 pCi/g where the WRW AL is 351 pCi/g.

No Further Action Recommendation

In accordance with RFCA, an NFAA was justified for UBC 122 based on the following:

- Surface soil analytical results were less than RFCA WRW soil ALs.
- Subsurface soil analytical results were all less than WRW soil ALs, with one exception.
- Results of the SSRS did not indicate additional action was necessary.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Group 100-1 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 122 on December 13, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 100-1, December 13.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-04-04, IHSS Group 100-1, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2004a, Final Project Closeout Report for Buildings 122 and 122S, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2004b, Data Summary Report for IHSS Group 100-1, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 123

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	100-4
Unit Name:	Health Physics Laboratory

This Final Update to the HRR for UBC 123 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 123 is summarized in this update. The following HRR volumes contain UBC 123 information:

Original Report – 1992 (DOE 1992);
Update Report – 1998 Annual (DOE 1998a);
Update Report – 2001 Annual (DOE 2001a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1953 to 1998

Historical Summary

The location of UBC 123 is shown on Figure 24. Building 123 was located on Central Avenue, between Third and Fourth Streets. The original building was constructed in 1953, with additions completed in 1968, 1972, and 1974. Building 123 housed the Site's Radiological Health Physics Laboratory, where water, biological materials, soil, air, and filter samples were analyzed for the presence of plutonium; americium; uranium; alpha, beta, and gamma radiation; tritium; beryllium; and organic constituents. In addition, personnel radiation dosimetry badges were counted and repaired in Building 123. Radioactive sources, including cesium, were stored in a below-grade concrete pit. Low-level liquid and chemical wastes were generated and transferred to on-site treatment systems through the process waste transfer and collection system (DOE 1992).

Portions of RCRA Unit 40, including sumps and pipes, were part of UBC 123. Some of the underground process waste lines associated with Building 123 were abandoned in place and plugged with cement in 1982 (that is, OPWL), while others remained in active use until laboratory operations were suspended in preparation for facility decommissioning (for example, NPWL).

Building 123 was decommissioned in 1998 in accordance with the PAM for the Decommissioning of Building 123 (DOE 1998b). At that time, the building structure and aboveground portions of the process waste system were removed, and the floor slab was sampled to assess areas of potential contamination. Contaminated portions of the slab that could not be decontaminated to meet the applicable unrestricted release criteria were encapsulated with epoxy paint to fix removable contamination and covered with steel plate. In addition, the underground sumps, pipe chases, and the process waste lines that ran from Room 156, through Rooms 157

and 158, to Valve Vault 18, were clean closed in place in accordance with the Closure Plan for the Building 123 Components of RCRA Unit 40 (DOE 1997). Partial closure was certified by a Colorado-registered professional engineer on May 28, 1998 (DOE 1998c). A contaminated sump, located in Room 125, was removed during decommissioning (DOE 1998d). Final disposition of the building slab, underground sumps, process waste lines (including the abandoned lines), and source pits was deferred to the ER Program.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 123 was characterized during 2000 and again during 2001 (DOE 2001b, 2001c, 2003b). During these two campaigns, 66 surface and subsurface locations were sampled. Soil samples were analyzed for radionuclides, metals, VOCs, and SVOCs. Analytical results indicated the following:

- Radionuclides and metals were detected at concentrations greater than background means plus two standard deviations;
- Lead was detected at a concentration greater than the RFCA Tier I soil AL (DOE et al. 1996) at one location in subsurface soil;
- Arsenic exceeding the RFCA Tier II soil AL (DOE et al. 1996) but below background was detected at one location in surface soil;
- Beryllium exceeding the RFCA Tier II soil AL (DOE et al. 1996) was detected at one location in surface soil;
- Methylene chloride was detected in subsurface soil at levels slightly above the RFCA Tier II soil AL (DOE et al. 1996); and
- At one location in surface soil, the SORs of measured concentrations of 2-4 dinitrotoluene and n-nitroso-di-n-propylamine compared to their respective Tier I soil ALs exceeded one.

A RFCA accelerated action (DOE et al. 1996) was conducted from February 5, 2002 through April 19, 2002 in accordance with ER RSOP Notification #02-01 (DOE 2002). Based on the adequacy of the previous sampling campaigns (DOE 2001b, DOE 1998c), additional characterization of UBC 123 was not conducted. During this time, the Building 123 slab was removed, as were below-grade features, including the building footers, source pits, sumps, process waste lines, and manholes. In addition, soil contaminated with lead and SVOCs was removed, and confirmation samples were collected from 29 surface and subsurface locations. Confirmation sampling results indicated all contaminant activities and concentrations were less than RFCA Tier I soil ALs (DOE et al. 1996) and proposed RFCA WRW soil ALs (DOE et al. 2002), which were subsequently approved and adopted (DOE et al. 2003). The highest residual radionuclide activities above background are listed below.

- Americium-241 – 0.19 pCi/g

- Plutonium-239/240 – 0.17 pCi/g
- Uranium-235 – 0.2 pCi/g
- Uranium-238 – 2.14 pCi/g

No Further Action Recommendation

In accordance with RFCA, an NFAA was justified for UBC 123 based on the following:

- Residual surface soil activities and concentrations were all less than RFACA WRW soil ALs.
- Residual subsurface soil concentrations were all less than WRW soil ALs.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 100-4 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 123 on April 22, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 100-4, April 22.

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

DOE, 1997, Closure Plan for the Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

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

DOE, 1998b, Proposed Action Memorandum for the Decommissioning of Building 123, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 1998c, Closure Certification for the Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 1998d, Final Close-Out Report, Building 123 Decommissioning Project, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001b, Final Data Summary Report for the Characterization of UBCs 123 and 886, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001c, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2002, Proposed Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 125

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	100-2
Unit Name:	Standards Laboratory

This Final Update to the HRR for UBC 125 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 125 is summarized in this update. The following HRR volumes contain UBC 125 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002a).

Date(s) of Operation or Occurrence

1963 to 2002

Historical Summary

The location of UBC 125 is shown on Figure 24. Building 125 housed the Standards Laboratories as well as offices for Metrology management personnel. The Standards Laboratories provided analytical standards for the on-site laboratories and provided calibration and maintenance of metrology standards for Measurement and Test Equipment (M&TE) used at the Site. After calibration, M&TE was returned to the appropriate user groups. Building 125 was demolished during September 2002 as a Type 1 facility.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

The only RCRA-regulated hazardous waste routinely produced in Building 125 consisted of spent lithium, nickel-cadmium, and mercury batteries, which were used in the electrical calibration process and accumulated in a 90-day accumulation area. In addition, used fluorescent bulbs, incandescent bulbs, and lead-acid batteries were accumulated. Fluorescent bulbs and incandescent bulbs were removed by utilities and maintenance workers and taken to an approved 90-day accumulation area. Lead-acid batteries were collected and sent to Waste Operations PU&D for recycling. Infrequent, nonroutine RCRA hazardous wastes that were generated included waste mercury and wipes contaminated with mercury (from the Vacuum, Moisture, and Pressure Laboratories), and waste Freon generated by cleaning the inside of pressure gages (from the Pressure Laboratory).

Interviews with individuals who worked in the facility revealed that several small mercury spills occurred within Building 125. These spills were localized in the vicinity of the work areas, and

all were immediately cleaned up (within 2 hours) to the point that residual mercury was not visible. In some instances, the Fire Department was called to assist with the cleanup. In several cases, the releases did not make it to the floor (that is, the mercury was released in cabinets or on countertops). All spills were less than one half of the RQ of 1 lb.

UBC Investigation

During building D&D (reconnaissance-level) characterization, a Jerome Model 431 Mercury Vapor Analyzer was use to analyze for potential residual mercury vapors (in the ppb range) from the areas identified during the interviews as having had a mercury release (DOE 2002b). Readings at exact locations of known mercury releases were 0 milligrams per cubic meter (mg/m^3) (where 1 mg/m^3 mercury vapor equals 0.122 ppm). The readings obtained above zero were at or near the instrument's sensitivity limit of 0.003 mg/m^3, and those readings were only accurate to +/-5 percent (based upon 0.100 mg/m^3). Thus, all readings were essentially zero.

With regard to the releases of mercury within Building 125, the chemical and physical properties of mercury indicate it would not likely have migrated beyond the tile seams, which were in very good condition and did not appear to have been compromised. In the unlikely event that mercury could have migrated through the tile flooring, it would have had to penetrate the underlying mastic before reaching the concrete slab. Because mercury does not absorb into concrete, nor does it cut or penetrate concrete media, the potential for UBC at Building 125 is remote.

No Further Action Recommendation

In accordance with RFCA Attachment 6, UBC 125 was recommended for NFAA (DOE 2002a). Based on the evidence presented above, the potential for mercury contamination in under-building soil is low. Mercury spills occurred within the building and were promptly cleaned up, and the probability of mercury migrating to soil under the building slab was very low. The NFAA designation for UBC 125 was approved by CDPHE (the LRA) on April 2, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, and T. Rehder, EPA Region VIII, RE: No Further Action Justification for Bldg. 125 UBC, April 2.

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

DOE, 2002a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, Reconnaissance Level Characterization Report for Buildings 125, 763, and Trailer 900C, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

PAC REFERENCE NUMBER: UBC 331

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	300-2
Unit Name:	Filter Test Facility

This Final Update to the HRR for UBC 331 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 331 is summarized in this Final Update to the HRR. The following HRR volume contains UBC 331 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1953 to 2005

Historical Summary

The location of UBC 331 is shown on Figure 24. Building 331, originally constructed in 1953, was designed and used as a warehouse. When the building became too small for parts storage, a new warehouse was constructed at another Site location, and Building 331 then became the Site maintenance garage. Additions to the structure, including the Fire Department structure (the east-west wing of Building 331 south of PAC 300-134[S]), were completed in 1967.

At one time, the northeastern corner of the vehicle maintenance garage (the north-south section of Building 331 west of PAC 300-134[S]) housed technical staff and a uranium R&D laboratory. Rolling of enriched uranium foil was conducted there in 1964. This area may also have been used for the depleted uranium coating studies. After Building 865 came on line in 1970, the area was converted for the development of remote handling techniques such as robotics and remote manipulator arms.

Building 331 was demolished during 2005 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the D&D Closeout Report (DOE 2005). The building slab and drain lines were completely removed.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 331 was characterized as part of IHSS Group 300-2 (August 16, 2004 to September 16, 2004) in accordance with IASAP Addendum #IA-03-08 (DOE 2003). Surface and subsurface

soil samples were collected from 15 sampling locations. COCs included radionuclides, metals, VOCs and SVOCs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2004, DOE et al. 2003). The highest radionuclide activities above background, which occurred in surface soil, are listed below.

- Americium-241 – 0.2 pCi/g
- Plutonium-239/240 – 2.4 pCi/g
- Uranium-234 – 5.7 pCi/g
- Uranium-235 – 0.2 pCi/g
- Uranium-238 – 5.7 pCi/g

No Further Action Recommendation

In accordance with RFCA, an NFAA was justified for UBC 331 based on the following:

- Surface soil analytical results were all less than RFCA WRW soil ALs.
- Subsurface soil analytical results were all less than WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Group 300-2 (DOE 2004) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 331 on December 17, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 300-2, December 17.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-08, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004, Data Summary Report for IHSS Group 300-2, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005, Final Closeout Report for Building 331, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 371

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	300-3
Unit Name:	Plutonium Recovery

This Final Update to the HRR for UBC 371 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 371 is summarized in this update. The following HRR volumes contain UBC 371 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1981 to 2004

Historical Summary

The location of UBC 371 is shown on Figure 24. Building 371 was the Plutonium Recovery Facility and later became the Interim Plutonium Storage/Repackaging Facility. The building went into operation in 1981 with a mission to replace plutonium residue recovery and waste operations in Buildings 771 and 774, recover plutonium from weapons returned from the stockpile, and provide storage of plutonium and plutonium-bearing materials. Plutonium recovery operations in Building 371 were terminated in 1988. After 1988, the building was used for storage of plutonium and uranium metals, oxides, residues, TRU wastes, LLW, and RCRA-regulated mixed waste and residues. The building was also used for characterization, treatment and repackaging activities to support final disposition of special nuclear material (SNM) and TRU waste from the Site.

Materials entering the plutonium recovery process were received as pieces of impure plutonium metal, plutonium oxide, various compounds containing plutonium, and plutonium-contaminated residues. The plutonium content of these materials ranged from a few percent to almost pure plutonium metal. The recovery processes reduced the plutonium and americium content of the residues to levels below economic discard limits.

Plutonium recovery operations used two different systems to separate high-purity plutonium metal from production-generated wastes. Pyrochemical processing used furnaces and molten salts to separate high-purity plutonium in a dry process. Pyrochemical processing was very efficient, but could not be used with all types of plutonium-bearing materials. Aqueous processing used a series of wet and dry chemical steps to separate high-purity plutonium from production-generated wastes.

Building 371 originally had two incinerators and their afterburners located in separate concrete canyons that were designed to burn most of the combustible wastes generated by the plutonium recovery operations. One incinerator was for high-specific activity waste, and the other for

low-specific activity waste. Because of the size and shape of the incinerators, they spanned multiple levels of Building 371. These two incinerators were stripped out in the mid 1980s to make way for the installation of the Plutonium Recovery Operations Verification Exercise gloveboxes and plutonium processing equipment.

Because the metal recovery process used large quantities of nitric acid, the building also contained a nitric acid recovery process. The process consisted of tanks, gloveboxes, an evaporator, and distillation columns.

The Building 371 Caustic Waste Treatment System (CWTS), located in the subbasement of Building 371, processed both high- and low-level plutonium caustic and acidic waste solutions to meet the Building 374 waste acceptance criteria. The CWTS process provided for the treatment of RCRA-regulated hazardous waste and aqueous waste streams.

There were four plutonium analytical laboratories in the Building 371/374 Complex to support environmental, safeguards, and other regulatory requirements. They included the liquids laboratory, standards laboratory, analytical laboratory, and liquid waste sampling laboratory. Building 371 also housed plutonium analytical laboratories and a chemical standards laboratory, which supported operations throughout the Site.

The shipping, receiving, storing, and retrieval of SNM occurred daily in Building 371 operations. The receiving and shipping of on-site and off-site waste, residue and SNM occurred from Dock 18T of the Building 371/374 Complex Support Facility. Two additional shipping and receiving docks were in the Support Facility on the southeastern corner. SNM was stored in vaults or vault-type rooms in Building 371. The Central Storage Vault (CSV) extended through the subbasement and basement levels. The CSV was designed to be ventilated by a nitrogen atmosphere and accessed by the remotely controlled Stacker-Retriever (S-R). The S-R moved materials between the shipping and receiving areas, plutonium storage vault, and plutonium recovery processing areas. SNM received in liquid form was stored in the CWTS tanks.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building. Several documented releases of materials occurred inside Building 371. Two releases, including approximately 55 gallons of wastewater released on the floor of Room 2217 on August 2, 1989, and approximately 55 gallons of dilute sulfuric acid solution released on the floor of Room 3811 on December 20, 1989, resulted in the filing of RCRA CPIRs (DOE 1992).

Building 371 was demolished during 2005 as a Type 3 facility in accordance with an approved DOP and as documented in the D&D Closeout Report (DOE 2005). The sub-basement slab, walls and ceiling, and the basement slab and walls were not removed and remain in place but are located more than 3 ft below final grade.

UBC Investigation

UBC 371 was characterized for the first time as part of IHSS Groups 300-3 and 300-4 (February 20, 2003 to April 19, 2003) in accordance with IASAP Addendum #IA-03-01 (DOE 2002). Subsurface soil samples were collected from 28 UBC 371 sampling locations (at ground surface under the slab, below the basement, and below the subbasement)

(DOE 2003b). In addition, surface and subsurface samples were collected from three sampling locations associated with Building 371 foundation drains. COCs included radionuclides, metals, VOCs and SVOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA soil ALs (DOE et al. 2003). The highest radionuclide activities above background within UBC 371 and UBC 374 are listed below.

- Americium-241 – 0.21 pCi/g
- Plutonium-239/240 – 0.18 pCi/g
- Uranium-235 – 0.37 pCi/g
- Uranium-238 – 5.52 pCi/g

No Further Action Recommendation

In accordance with RFCA, an NFAA was justified for UBC 371 based on the following:

- Subsurface soil analytical results were all less than RFCA WRW soil ALs. (No surface soil samples were collected.)
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Groups 300-3 and 300-4 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 371 on August 21, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Groups 300-3 and 300-4, August 21.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Groups 300-3 and 300-4, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Final Closeout Report for Buildings 371 and 374, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 374

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	300-4
Unit Name:	Waste Treatment Facility

This Final Update to the HRR for UBC 374 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 374 is summarized in this update. The following HRR volumes contain UBC 374 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1978 to 2004

Historical Summary

The location of UBC 374 is shown on Figure 24. Building 374 began operation in the late 1970s and housed several liquid process waste treatment systems for wastes generated from production facilities throughout RFETS. The systems included a number of ancillary storage tanks and gloveboxes and most notably filtration systems and an evaporator to remove radionuclides and volume reduce aqueous wastes. Several documented releases of materials occurred within the building:

- A solution of 40 percent dissolved nitrate salt overflowed Tank D-883-B in Room 3809 on June 15, 1989, and ran into the process waste floor drains.
- Process solution filled a glovebox in Room 3801, pushed out a window of the box, and approximately 50 gallons spilled onto the floor on November 23, 1989.
- Approximately 100 gallons of process waste solution leaked from a pump in Room 3810 and drained through a process floor drain on November 29, 1989.
- Approximately 500 gallons of pH 12.6 solution of hydroxide salt leaked from a tank in Room 4101; some ran through cracks in the concrete floor to a hallway beneath the room.
- Operator error led to a spill of brine concentrate in Room 3809; the spill was rinsed down the process drains.
- Due to an inoperative floor drain, 150 gallons of brine concentrate spilled onto the floor of Room 3810 (DOE 1992).

Soil and/or groundwater beneath the building may have become contaminated because of such releases. Building drains, sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

Building 374 was demolished in early 2005 in accordance with an approved DOP and as documented in the D&D Closeout Report (DOE 2005). The contaminated slab remains in place, but it is located more than 3 ft below final grade.

UBC Investigation

UBC 374 was characterized as part of IHSS Groups 300-3 and 300-4 (February 20, 2003 to April 19, 2003) in accordance with IASAP Addendum #IA-03-01 (DOE 2002). Surface and subsurface soil samples were collected from 7 UBC 374 sampling locations (5 under the slab, 1 adjacent to the NPWL, and 1 adjacent to the foundation drain) (DOE 2003b). COCs included radionuclides, metals, VOCs and SVOCs. Analytical results indicated contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003) with one exception. The arsenic concentration at sampling location BZ45-003 at 0.0 - 0.5 ft below the building slab was 23.9 mg/kg, and the AL is 22.2 mg/kg. Based on the SSRS, no accelerated action soil removal was required. The highest radionuclide activities above background within UBC 371 and UBC 374 are listed below.

- Americium-241 – 0.21 pCi/g
- Plutonium-239/240 – 0.18 pCi/g
- Uranium-235 – 0.37 pCi/g
- Uranium-238 – 5.52 pCi/g

No Further Action Recommendation

In accordance with RFCA an NFAA was justified for UBC 374 based on the following:

- Surface and subsurface soil analytical results were all less than RFCA WRW soil ALs, with one subsurface exception noted above.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Groups 300-3 and 300-4 (DOE 2003b) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the NFAA status for UBC 374 on August 21, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Groups 300-3 and 300-4, August 21.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Data Summary Report for IHSS Groups 300-3 and 300-4, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005, Final Closeout Report for Buildings 371 and 374, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 439

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	400-1
Unit Name:	Radiological Survey

This Final Update to the HRR for UBC 439 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 439 is summarized in this update. The following HRR volumes contain UBC 439 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1970 to 2004

Historical Summary

The location of UBC 439 is shown on Figure 24. Building 439, the Radiological Survey building, was a sheet metal structure built on an at-grade concrete slab approximately 100 ft by 50 ft. The structure was a maintenance building, and was later used for PU&D operations. Building 439 was used to receive, process, and ship surplus equipment and materials released by Site custodians, and housed small portable counters to monitor alpha, beta and gamma radiation. Sources were controlled through Site accountability procedures. Smear samples collected throughout RFETS were brought to Building 439 for counting. Prior to demolition, the building was used as the break area for Building 440 operations personnel. Building 439 was demolished in 2005 as a Type 1 facility.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills, may have led to under building contamination. Building floors and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building. However, there were no process lines or foundation drains under the Building 439. There was one floor drain connected to the sanitary sewer system. The sewer line exited the building near the northwestern corner.

UBC Investigation

UBC 439 was characterized as part of IHSS Group 400-1 (June 7 and 8, 2004) in accordance with IASAP Addendum #IA-04-08 (DOE 2003). Surface and subsurface soil samples were collected from 5 sampling locations under the building slab (DOE 2004b). Because of refusal, none of the subsurface sampling intervals were completed to 2.5 ft. However, based on analytical data resampling was not required. COCs included radionuclides, metals and VOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW

soil ALs (DOE et al. 2003). The highest radionuclide activities above background, which occurred in surface soil, are listed below.

- Uranium – 4.8 pCi/g
- Uranium-235 – 2.7 pCi/g
- Uranium-238 – 4.8 pCi/g

No Further Action Recommendation

In accordance with RFCA an NFAA was justified for UBC 439 based on the following:

- Surface and subsurface soil analytical results were less than RFCA WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Group 400-1 (DOE 2004b) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the NFAA status for UBC 439 on August 23, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 400-1, August 23.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-04-08, IHSS Group 400-1, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 400-1, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 440

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	400-2
Unit Name:	Modification Center

This Final Update to the HRR for UBC 440 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 440 is summarized in this update. The following HRR volumes contain UBC 440 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Late 1960s to 2004

Historical Summary

The location of UBC 440 is shown on Figure 24. Building 440 was constructed in the late 1960s for production control and shipping final assembly products and wastes for disposal. SNM and depleted uranium were staged and shipped out of this building by truck and railcar. For a brief period, Building 440 was used as a general warehouse and storage area for non-nuclear construction and fabrication materials.

In the early 1970s, Building 440 was used to modify and repair vehicles to meet specific DOE requirements for transport of SNM and radioactive wastes. Building 440 was expanded three times to include a railcar bay, high bay, paint booths, storage areas, and locker rooms in support of transport modification efforts. Armor, communication equipment, and comfort features were added to transport vehicles. Vehicle modification work in Building 440 continued until 1994, when the mission was transferred to another DOE facility. Most of the original equipment associated with this activity was shipped to other DOE plants.

Production processes in Building 440 included various welding, painting, machining, pipefitting, metalworking, and electrical work used to modify transports. Modification efforts focused on developing entry deterrents. Paint booths were used to coat fabricated, non-nuclear components and the transports. The gantry and 5-ton cranes were used to move materials associated with the transport modification effort.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

Building 440 was demolished during FY2005 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the D&D Closeout Report (DOE 2005). A portion of the building slab was left in place.

UBC Investigation

UBC 440 was characterized as part of IHSS Group 400-2 (August 14, 2004 to August 20, 2004) in accordance with IASAP Addendum #IA-04-01 (DOE 2003). Surface and subsurface soil samples were collected from 20 sampling locations (10 under the Building 440 slab and 10 adjacent to the slab) (DOE 2004b). COCs included radionuclides, metals and VOCs. Analytical results indicated contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003), with one exception. The arsenic concentration at sampling location BW34-042 (at 0.5 – 2.5 ft bgs) was 28 mg/kg, and the WRW soil AL is 22.2 mg/kg. The highest radionuclide activities above background are listed below.

- Americium-241 – 0.07 pCi/g
- Plutonium-239/240 – 0.07 pCi/g
- Uranium-234 – 4.9 pCi/g
- Uranium-235 – 0.27 pCi/g
- Uranium-238 – 4.9 pCi/g

No Further Action Recommendation

In accordance with RFCA an NFAA was justified for UBC 440 based on the following:

- Surface soil analytical results were less than RFCA WRW soil ALs.
- Subsurface soil analytical results were less than WRW soil ALs, with one exception.
- Results of the SSRS indicated that additional action was not necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Group 400-2 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 440 on September 27, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 400-2, September 27.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan FY 2003 Addendum #IA-04-01, IHSS Groups 400-2, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 400-2, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Final Closeout Report for Building 440, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 441

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	400-8
Unit Name:	Office Building

This Final Update to the HRR for UBC 441 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 441 is summarized in this update. The following HRR volumes contain UBC 441 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1952 to 2002

Historical Summary

The location of UBC 441 is shown on Figure 24. Building 441 was located in the northwestern portion of the 400 Area and was placed into service in 1952. The building footprint was approximately 17,075 ft^2. The building was originally used as a laboratory, and was converted into an office building in 1966. The building was demolished during 2003 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the D&D Closeout Report (DOE 2004b). Because the footprint of the building overlapped PAC 400-122 (OPWL Tanks T-2 and T-3), the soil beneath the building was potentially affected by nitrates, volatiles, PCBs, and radioactive contaminants. Details on the tanks are presented in the PAC 400-122 writeup.

UBC Investigation

UBC 441 was characterized as part of the IHSS Group 400-8 accelerated action (April 7, 2003 to December 22, 2003) in accordance with IASAP Addendum #IA-03-01 (DOE 2002). Surface and subsurface soil samples were collected from 11 sampling locations under the Building 441 slab (DOE 2004c). COCs included radionuclides, metals, VOCs, SVOCs, and nitrates. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003). One location (BW38-003) has a subsurface lead concentration of 942 mg/kg, and the AL is 1,000 mg/kg. The next highest lead concentration was 100 mg/kg. The highest radionuclide activities above background are listed below.

- Uranium-234 – 4.6 pCi/g
- Uranium-235 – 0.27 pCi/g
- Uranium-238 – 4.6 pCi/g

In accordance with ER RSOP Notification #03-06 (DOE 2003), the Building 441 slab, condensate return sump, footers, and caissons were removed. The remaining contents of Tanks T-2 and T-3 and the tanks were sampled, removed, and disposed. The OPWL under the building were tapped, drained, and removed. OPWL manholes were removed and the ends of the remaining pipelines were grouted. One sanitary sewer system manhole was removed to 4 ft below grade. The remaining base of the manhole and its pipe connections were grouted.

During the accelerated action for IHSS Group 400-8, that included Building 441 slab removal, mercury was noted within the sanitary sewer and process waste lines. The mercury in the sanitary sewer and process waste lines was most likely derived from the laboratory operations, possibly from broken lab instruments or accidental releases from manometers.

The mercury was primarily found in the pipe joints on both lines. The joints are slightly lower than the adjacent piping and tend to trap heavy liquids. The mercury was removed during pipe removal and dispositioned appropriately. Mercury was detected at a few locations near UBC 441, but concentrations were well below RFCA WRW soil ALs.

No Further Action Recommendation

In accordance with RFCA, an NFAA was justified for UBC 441 based on the following:

- Surface and subsurface soil analytical results were less than RFCA WRW soil ALs.
- Results of the SSRS not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 400-8 (DOE 2004c) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 441 on March 19, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 400-8, March 19.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, IHSS Group 400-8, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Final Project Closeout Report for Building 441, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2004c, Closeout Report for IHSS Group 400-8, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 442

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	400-7
Unit Name:	Filter Test Facility

This Final Update to the HRR for UBC 442 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 442 is summarized in this update. The following HRR volume contains UBC 442 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1953 to 2000

Historical Summary

The location of UBC 442 is shown on Figure 24. Building 442 was originally used to launder uranium-contaminated protective clothing from Building 444 and then later used to test and store HEPA filters and respirator cartridges. Radioactive sources were used in some of the test equipment. The building was demolished during 2002 as a Type 1 facility.

Both radioactive and chemical materials from the laundry operations, including uranium, enriched uranium, and beryllium, potentially contaminated the soil beneath the building. Indoor unplanned events and routine operations, such as chemical spills and releases from waste lines, may have led to this contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building. Soil in the vicinity of this building was also contaminated by radioactive release. In December 1963, liquid-containing barrels stored near the building leaked or spilled, and the liquid drained into the ditch on the northwestern side of the building (IHSS 400-157.1).

UBC Investigation

UBC 442 was characterized as part of IHSS Group 400-7 accelerated action (June 13, 2002 to October 25, 2004) in accordance with IASAP Addendum #IA-02-05 (DOE 2002a, DOE 2004). Surface and subsurface soil samples were collected from 13 sampling locations under the slab. COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003). The highest residual radionuclide activities above background are listed below.

- Uranium-234 – 3.4 pCi/g
- Uranium-235 – 0.22 pCi/g
- Uranium-238 – 3.4 pCi/g

During the IHSS Group 400-7 RFCA accelerated action (DOE et al. 1996), the Building 442 slab and other subsurface building structural features, including footer walls, footers, two sumps, one scale pit, contaminated sections of sanitary waste lines, and asphalt around the building, were removed in accordance with ER RSOP Notification #02-06 (DOE 2002b, 2004). Approximately 30 ft of the remaining ends of the sanitary waste lines were grouted. The Building 442 excavation was backfilled and regraded.

No Further Action Recommendation

In accordance with RFCA, an NFAA was justified for UBC 442 based on the following:

- Surface soil analytical results were all less than RFCA WRW soil ALs.
- Subsurface soil analytical results were all less than RFCA WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 400-7 (DOE 2004) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 442 on January 10, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 400-7, January 10.

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

DOE, 2002a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-05, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification #02-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Closeout Report for IHSS Group 400-7, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 444

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	400-3
Unit Name:	Fabrication Facility

This Final Update to the HRR for UBC 444 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 444 is summarized in this update. The following HRR volumes contain UBC 444 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

1953 to 2004

Historical Summary

The location of UBC 444 is shown on Figure 24. Originally called Plant A, Building 444 was one of the first buildings constructed at the Plant. Building 444 was the primary non-nuclear manufacturing facility at the Site. Manufacturing processes were used to fabricate weapons components and assemblies from a variety of materials, including depleted uranium, beryllium, stainless steel, aluminum, and vanadium (DOE 1992).

The production equipment located in Building 444 was used to support war reserve, special orders work, and manufacturing development. Operations included casting, machining, heat-treating, welding, brazing, chemical milling, plating, coating, and testing and inspection of weapons components made of depleted uranium, depleted uranium composites, beryllium, stainless steel, and ferric metals. Each material required different processing techniques.

When the Rocky Flats manufacturing and processing scope was expanded in 1956 and 1957, additions were made to Building 444. The expansion was motivated by changes in trigger design and subsequent increased fabrication requirements.

The original building area contained a foundry and numerous shops and laboratories. Shops within the original portion of the building included depleted uranium, beryllium, and carbon (graphite) machine shops; and heat treating, coating, tool grinding, welding and brazing, and building maintenance shops. A portion of the precision shop was also housed in this building. Laboratories included pressure- and leak-testing, plating, precision measuring, and nondestructive testing. Some of the former shop areas were converted into storage areas for excess tools and materials.

Building 444 was demolished during FY2005 as a Type 2 facility in accordance with an approved Facility Disposition RSOP notification and as documented in the D&D Closeout

Report for Buildings 444 and 447 (DOE 2005). The entire building slab was removed, including the basement slab.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 444 was characterized as part of the IHSS Group 400-3 accelerated action (May 27, 2003 to July 17, 2003) in accordance with IASAP Addendum #IA-03-06 (DOE 2003a, 2003b). Surface and subsurface soil samples were collected from 43 sampling locations. COCs included radionuclides, metals (including beryllium) and VOCs. Analytical results indicated contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with one exception. The lead concentration in surface soil at sampling location BY37-003 was 1,500 mg/kg, and the AL is 1,000 mg/kg (DOE 2003b). Soil was not removed from the area with the elevated lead concentration because the 95 percent UCL of the mean lead concentration across the area of concern divided by the soil AL was less than one (DOE 2001). The highest radionuclide activities above background are listed below.

- Uranium-234 – 35.27 pCi/g
- Uranium-235 – 0.74 pCi/g
- Uranium-238 – 35.27 pCi/g

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 444 based on the following:

- Contaminant activities and concentrations in surface soil were less than RFCA WRW soil ALs, with one minor exception that does not warrant further action based on the elevated measurement comparison (DOE 2001).
- Contaminant activities and concentrations in subsurface soil were less than WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Group 400-3 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 444 on December 18, 2003 (CDPHE 2003).

Comments

UBC 444 includes PIC 57.

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 400-3, December 18.

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

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

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 447

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	400-3
Unit Name:	Fabrication Facility

This Final Update to the HRR for UBC 447 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 447 is summarized in this update. The following HRR volumes contain UBC 447 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004).

Date(s) of Operation or Occurrence

1956 to 2003

Historical Summary

The location of UBC 447 is shown on Figure 24. Building 447 was part of the 444 Complex and was a depleted uranium fabrication facility. Ingots and semi-finished/finished depleted uranium parts were heat-treated in the induction furnace. In 1956, the chip roaster in Building 447 became operational. Depleted uranium chips recovered from machining areas were collected in covered 55-gallon drums, transferred to Building 447, and burned to an oxide (more stable form) under controlled conditions in the chip roaster. The oxides were packaged and shipped offsite for disposal (DOE 1992). The building was demolished during 2004 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the D&D Closeout Report for Buildings 444 and 447 (DOE 2005a). The slab was decontaminated to meet unrestricted release levels. Some of the slab and OPWL remain; however, all of the slab and OPWL under the basement were removed. The ends of the remaining OPWL were grouted.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 447 was characterized as part of the IHSS Group 400-3 accelerated action (May 27, 2003 to July 17, 2003) in accordance with IASAP Addendum #IA-03-06 (DOE 2003a, 2003b). Surface and subsurface soil samples were collected from 14 sampling locations. COCs included radionuclides, metals (including beryllium), and VOCs. Analytical results indicated all

contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003). The highest radionuclide activities above background are listed below.

- Uranium-234 – 18.09 pCi/g
- Uranium-235 – 0.41 pCi/g
- Uranium-238 – 18.09 pCi/g.

The storm drain sump and associated PCB-contaminated sediment were removed as part of the D&D of Building 447 in 2005. After removal, two soil samples were collected at this location and analyzed for PCBs. Results indicated Aroclor-1254 was present at an estimated concentration of 38 µg/kg and Aroclor-1260 was present at a concentration of 52 µg/kg. The manhole was filled with 10 to 15 ft of concrete starting from the bottom of the manhole.

The storm drain pipeline remains in place however, both ends were plugged with concrete at the manholes. The storm drain was disrupted in three places and plugged with flow fill south of Building 440 and north of Building 447. At the disruption north of Building 440 concrete was used to plug the pipe. This 8-inch diameter pipe was previously reported as perforated however, as determined during field activities, it is constructed of corrugated metal pipe. Approximately 10 yards of flow fill was used at each location. Soil at the outfall of this pipeline was also sampled. Results indicated PCB concentrations were less than WRW soil ALs (DOE 2005b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 447 based on the following:

- Contaminant activities and concentrations in surface soil were less than RFCA WRW soil ALs.
- Contaminant activities and concentrations in subsurface soil were less than WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Group 400-3 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 447 on December 18, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 400-3, December 18.

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

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-06, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2003b, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Final Closeout Report for Buildings 444 and 447, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005b, Data Summary Report for IHSS Group 000-3, PAC 000-505 Storm Drains, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 528

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	500-3
Unit Name:	Temporary Waste Holding Building

This Final Update to the HRR for UBC 528 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 528 is summarized in this update. The following HRR volume contains UBC 528 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1969 to 2004

Historical Summary

The location of UBC 528 is shown on Figure 24. Constructed in 1969, Building 528 was a below-grade concrete vault structure holding two 2,000-gallon in-sump steel tanks designed to receive process waste from Building 559. These wastes were mainly aqueous solutions of hydrochloric acid, nitric acid, sulfuric acid, potassium hydroxide, detergent, radionuclides, and metals. Pesticides, herbicides, and PCBs may have been present as constituents of samples analyzed. Waste was held in the tanks until it was pumped to Building 374 for treatment.

Building 528 was demolished during 2005 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the D&D Closeout Report (DOE 2005a).

Soil and/or groundwater beneath the building may have become contaminated because of leaks and releases associated with the waste handling system, including waste lines. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building. Groundwater contaminated from other sources within the IA may have also contaminated soil under the structure.

UBC Investigation

UBC 528 was characterized as part of the IHSS Group 500-3 accelerated action (October 15, 2003 to April 15, 2005) in accordance with IASAP Addendum #IA-03-12 (DOE 2003). Subsurface soil samples were collected from 13 sampling locations (two under the slab and 11 around the building) (DOE 2005b). COCs included radionuclides, metals, VOCs, pesticides, herbicides, and PCBs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003).

A RFCA accelerated action (DOE et al. 1996) was conducted in accordance with ER RSOP Notification #05-02 (DOE 2005c) and included removal of the Building 559 slab and footers, Building 528 Pit, and all OPWL, sanitary sewers, and storm drains beneath and adjacent to

Buildings 559 and 528. Following removal activities, the Building 528 excavation was backfilled with clean fill, and the area was regraded and reseeded. Residual contamination at levels less than the WRW soil ALs remains in surface and subsurface soil in the area. The highest residual radionuclide activities above background, which occur in the subsurface soil, are listed below.

- Americium-241 – 2.22 pCi/g
- Plutonium-239/240 – 12.68 pCi/g
- Uranium-234 – 4.67 pCi/g
- Uranium-235 – 0.22 pCi/g
- Uranium-238 – 4.67 pCi/g

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 528 based on the following:

- Contaminant activities and concentrations in subsurface soil were less than RFCA WRW soil ALs. (No surface soil samples were collected.)
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 500-3 (DOE 2005b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 528 on June 24, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Rampe, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 500-3, June 24.

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

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

DOE, 2005a, Final Project Closeout Report for Building 559 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005b, Closeout Report for IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005c, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #05-02, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 559

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	500-3
Unit Name:	Service Analytical Laboratory

This Final Update to the HRR for UBC 559 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 559 is summarized in this update. The following HRR volume contains UBC 559 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1968 to 2004

Historical Summary

The location of UBC 559 is shown on Figure 24. Building 559, Service Analytical Laboratory, was constructed in 1967 and began operations in January 1968. Both the production support and Plant support laboratories were located in the building, which housed facilities for conducting spectrochemical, chemical, and mass spectrometric analyses on samples of recovered, cast, and purified materials from the Plant. The northern side of the building contained offices, radiation monitoring, a computer room, restrooms, a locker room, store rooms, and maintenance equipment. Four large bays in the remainder of the building housed laboratories, as well as mechanical equipment.

The Building 559 footprint was approximately 35,000 ft^2. An east-west air tunnel approximately 12 ft wide and 200 ft long ran beneath the laboratory bays in the southern portion of the building. A north-south air tunnel approximately 13 ft wide and 30 ft long connected the southeastern portion of Building 559 with the northeastern portion of Building 561, which housed filter plenums for Building 559. Air ducts constructed of transite pipe were present beneath the Building 559 slab.

Specific laboratories included the spectrochemical analysis laboratory, chemistry laboratory, and mass spectroscopy laboratory. Radioactive materials were received and shipped from a loading dock on the southern side of the building. A second loading dock at the western end of the building received other building supplies. The production support laboratory performed quantitative and qualitative chemical analyses for plutonium operations to ensure that raw materials, produced materials, and final products conformed to specifications. Samples consisted chiefly of plutonium and plutonium alloys, other metals and their alloys, plutonium and uranium oxides, solutions of plutonium and other elements, and various gases. Quantitative analyses included gallium in plutonium alloy, plutonium assay, carbon-hydrogen-nitrogen contents, ion analysis, tritium content, emission spectrometric analysis, atomic absorption, coulometric analysis, XRF, and identification of various isotopes.

The Plant support laboratory performed analyses on materials for functions indirectly related to production (for example, radiation monitoring and waste treatment). Specific tasks included Raschig ring analysis and certification, duct remediation, PCB analysis, and LLW characterization. In 1973, the construction of Building 561 expanded the capabilities of the laboratory. Later projects included the Waste Isolation Pilot Project Bin and Alcove test program, the WSRIC program, and consolidation and stabilization of nuclear materials. This group performed mass spectrometry analyses of isotopes of plutonium, uranium, lithium, and boron (thermal ionization); as well as organic compounds and gases. Other analyses included infrared analysis for impurities, thermal characterization analysis to determine phase changes as a function of temperature, and titrimetry to determine the water content of organic solvents.

Building 559 was demolished during 2005 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the D&D Closeout Report (DOE 2005a). The demolition included removal of the building slab, the east-west air tunnel, and the tunnel between Buildings 559 and 561.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building. The facility was originally built in 1968 with Pyrex glass process waste lines running under the building slab. Several documented releases occurred as a result of breakage of the glass lines (DOE 1992).

UBC Investigation

UBC 559 was characterized as part of the IHSS Group 500-3 accelerated action (October 15, 2003 to April 15, 2005) in accordance with IASAP Addendum #IA-03-12 (DOE 2003). Surface and subsurface soil samples were collected from 32 sampling locations (30 under the building slab and 2 adjacent to the building) (DOE 2005b). COCs included radionuclides, metals, VOCs, and PCBs. Analytical results indicated contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with five exceptions listed below.

- At sampling location CD44-005 (under Room 130) the surface soil americium-241 activity was 1,200 pCi/g, and the WRW soil AL is 76 pCi/g.
- At sampling location CD44-005 (under Room 130) the surface soil plutonium-239/240 activity was 8,130 pCi/g, and the WRW soil AL is 50 pCi/g.
- At sampling location CD44-009 the plutonium-239/240 activity at 5.0 – 5.3 ft near the east-west air tunnel was 60.53 pCi/g, and the WRW soil AL is 50 pCi/g.
- At sampling location CD44-012 the plutonium-239/240 activity at 9.0 – 9.3 ft near the east-west air tunnel was 74.67 pCi/g, and the WRW soil AL is 50 pCi/g.
- At sampling location CD44-015 the plutonium-239/240 activity at 9.0 – 9.3 ft near the east-west air tunnel was 157.83 pCi/g, and the WRW soil AL is 50 pCi/g.

A RFCA accelerated action (DOE et al. 1996) was conducted in accordance with ER RSOP Notification #05-02 (DOE 2005c) and included removal of the Building 559 slab and footers, Building 528 Pit, and all OPWL, sanitary sewers, and storm drains beneath and adjacent to Buildings 559 and 528. Soil remediation in the Room 130 and air tunnel areas and associated

confirmation sampling occurred in March and April 2005. The highest residual radionuclide activities above background are listed below.

- Americium-241 – 6.2 pCi/g
- Plutonium-239/240 – 45.2 pCi/g
- Uranium-234 – 5.14 pCi/g
- Uranium-235 – 0.30 pCi/g
- Uranium-238 – 5.14 pCi/g

Following building and soil removal activities, the Building 559 excavation was backfilled with clean fill, and the area was regraded and reseeded. Residual contamination at levels less than the WRW ALs remains in surface and subsurface soil in the area.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 559 based on the following:

- Residual contaminant activities and concentrations in surface soil were less than RFCA WRW soil ALs.
- Residual contaminant activities and concentrations in subsurface soil were less than WRW soil ALs.
- Results of the SSRS presented in the Closeout Report for IHSS Group 500-3 (DOE 2005b) did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 500-3 (DOE 2005b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 559 on June 24, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Rampe, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 500-3, June 24.

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

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

DOE, 2005a, Final Project Closeout Report for Building 559 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005b, Closeout Report for IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005c, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #05-02, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 701

IHSS Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: 700-3

Unit Name: Waste Treatment Research and Development

This Final Update to the HRR for UBC 701 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 701 is summarized in this update. The following HRR volume contains UBC 701 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1962 to 2002

Historical Summary

The location of UBC 701 is shown on Figure 24. Built in 1962, Building 701 was a research and design facility used to design, build, and evaluate bench-scale waste treatment processes. The building was located north of Building 776. The main purpose of the research and design group located in this building was to change the form of waste materials for off-site disposal. Information from the waste treatment research and design projects was applied to waste treatment processes throughout the Site. All process evaluations conducted in Building 701 were conducted using nonradioactive materials; once the processes were transferred to the production and waste treatment facilities, they were applied to radioactive waste. Treatment technologies evaluated included the following:

- Rotary-kiln incineration;
- Fluidized-bed incineration;
- Cementation of process waste and pond sludge;
- Thin-film evaporation; and
- Vitrification.

Building 701 was also used for waste storage, including storage of radioactive waste. The building was demolished during 2004 as part of the 776/777 Closure Project in accordance with an approved DOP and as documented in the Decommissioning Closeout Report for the 776/777 Closure Project (DOE 2005a).

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been

otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 701 was characterized as part of IHSS Group 700-3 (May 28, 2003 to December 1, 2004) in accordance with IASAP Addendum #IA-03-04 (DOE 2003). Surface and subsurface soil samples were collected from 11 sampling locations (10 under the building slab and one just north of the slab) (DOE 2005b). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated all contaminant concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003), with one exception. The americium-241 activity in the surface soil at sampling location CE46-019 was 3,438 pCi/g, and the WRW soil AL is 76 pCi/g. Based on this elevated activity, soil removal at the UBC was conducted.

A RFCA accelerated action (DOE et al. 1996) was conducted in accordance with ER RSOP Notification #04-04 (DOE 2004) and involved removal of the Building 701 concrete slab, the fuel-oil line and oil-stained soil located near the northwestern corner of the slab, and the radiologically contaminated surface soil found under the slab at sampling location CE46-019 (DOE 2005b). The excavation to remove the fuel-oil line and oil-stained soil was approximately 47 ft by 6 ft by 2.5 ft deep. The excavation to remove the radiologically contaminated soil discovered during building demolition was approximately 7.5 ft by 7 ft by 3 ft. Ten confirmation samples were collected from the excavation bottoms and sidewalls to confirm that remaining concentrations were less than RFCA WRW soil ALs and the RFCA TPH soil standard. Residual contaminants include radionuclides, metals, VOCs, SVOCs, and TPH, but all residual contaminant concentrations were less than WRW soil ALs and TPH soil standard (DOE et al. 2003). Residual plutonium-239/240 activities above background range from 0.11 to 37.1 pCi/g. The highest americium-241activity is 8.2 pCi/g, and the highest TPH concentration is 69.5 mg/kg. The highest residual uranium activities are listed below.

- Uranium-234 – 4.3 pCi/g
- Uranium-235 – 0.29 pCi/g
- Uranium-238 – 4.3 pCi/g

The fuel-oil line excavation was backfilled with clean fill from the T371 area, and the hot-spot excavation was backfilled with soil in the immediate area. After backfilling, the areas were graded. The site was reseeded after the removal of Buildings 776, 777 and 778 and the railroad spur. The concrete debris, fuel-oil line, oil-stained soil, and radiologically contaminated soil were disposed of as LLW.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 701 based on the following:

- Residual surface soil activities and concentrations were all less than RFCA WRW soil ALs.
- Residual subsurface soil activities and concentrations were all less than RFCA WRW soil ALs.

- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-3 Volume I (DOE 2005b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 701 (excluding UBCs 776, 777 and 778 and Tank T-18) on April 19, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-3 Volume I (B701) – Approval, April 19.

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

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, IHSS Group 700-3, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #04-04, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005a, Decommissioning Closeout Report for the 776/777 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005b, Closeout Report for IHSS Group 700-3 Volume I, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 707

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-2
Unit Name:	Plutonium Fabrication and Assembly

This Final Update to the HRR for UBC 707 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 707 is summarized in this update. The following HRR volume contains UBC 707 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1970 to 2002

Historical Summary

The location of UBC 707 is shown on Figure 24. Building 707 was a manufacturing facility for the fabrication of plutonium parts and assembly of parts made of plutonium and other materials into nuclear weapons components. Building 707 became the primary plutonium fabrication building at the Plant when operations commenced on May 25, 1970. A wing was added in 1971 to accommodate plutonium casting and fabrication processes moved from Building 776/777 as a result of the 1969 fire. In 1992, the production of weapons components ceased, and Building 707 was then used for the stabilization of plutonium and the processing and repackaging of plutonium residues.

Operations in Building 707 included metallurgy, parts fabrication, inspection and testing, assembly, and storage. Plutonium, particularly in finely divided forms, was subject to oxidation and spontaneous combustion, and required a controlled environment for processing and storage. Control was achieved by enclosing plutonium metal and associated equipment within gloveboxes and conveyors and by providing certain work areas with an inert atmosphere to control the pyrophoric nature of plutonium. The general flow of work and materials was from north to south within the building, starting with Modules A, J, and K, then sequentially from Module B to Module H.

Several locations in Building 707 were used to store nuclear and non-nuclear materials. The X-Y retriever, which began operations in 1971, was housed in Module K, and was used to sort and retrieve plutonium metal for distribution to other processes in Building 707. Using the X-Y retriever, operators retrieved plutonium metal from storage and conveyed it to the X-Y shuttle area where it was cut and weighed. The cut pieces were then conveyed to Modules A, J, or K for casting, or Module B for rolling and forming. Rooms 141 and 142 in Module J (the J vault) were used for storage of oxides, plutonium buttons received from other DOE facilities, and to some extent, Building 771 molten salt extracts.

Building 707 was demolished in early 2005 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the Decommissioning Closeout Report for the 707 Closure Project (DOE 2005a). Several small segments of OPWL P-19 were removed within UBC 707. The ends of segments of P-19 left in place were grouted. OPWL P-14 is shown on maps extending from southwest to northeast through UBC 707. During D&D it was determined that this line did not exist (DOE 2005b). Building caissons or beams may be present at depths of at least 3 ft bgs.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 707 was characterized as part of IHSS Group 700-2 (February 3, 2004 to December 15, 2004) in accordance with IASAP Addendum #IA-04-02 (DOE 2003a). Surface and subsurface soil samples were collected from 53 sampling locations (38 under the building slab and 15 around the building) (DOE 2005c). COCs included radionuclides, metals, VOCs, SVOCs, and PCBs. Analytical results indicated contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003), with seven exceptions. There were six elevated arsenic concentrations (three in surface soil and three in subsurface soil) and one elevated benzo(a)pryrene concentration (in surface soil). Based on evaluation of analytical results, only one arsenic hot spot, with surface and subsurface exceedances at sampling location CE43-007, was removed (DOE 2005c). The concentration at this location was greater than three times the RFCA WRW soil AL. Soil was not removed at the other three surface soil sampling locations because concentrations were less than three times the WRW soil AL and because the 95 percent UCL of the mean arsenic concentrations across the area of concern divided by the soil AL was less than one. Soil was not removed at the three subsurface soil sampling locations based on the SSRS. The area is not susceptible to high erosion. Residual concentrations exceeding WRW soil ALs are presented below.

- The arsenic concentration in surface soil at sampling location CG42-008 is 27 mg/kg, and the WRW soil AL is 22 mg/kg.
- The arsenic concentration in subsurface soil at sampling location CE43-007 (at 0.5 to 2.5 ft) is 40.8 mg/kg.
- The arsenic concentration in surface soil at sampling location CG43-015 is 24.2 mg/kg.
- The arsenic concentration in subsurface soil at sampling location CG43-015 (at 0.5 to 2.5 ft) is 24.3 mg/kg.
- The benzo(a)pyrene concentration in surface soil at sampling location CG43-018 is 3700 µg/kg, and the WRW soil AL is 3,490 µg/kg.
- The arsenic concentration in subsurface soil at sampling location CG43-018 (at 0.5 to 2.0 ft) is 25.5 mg/kg.

Soil removal was conducted as a RFCA accelerated action (DOE et al. 1996) in accordance with ER RSOP Notification #04-05 (DOE 2003b). An area, approximately 6 ft by 8 ft, was excavated to approximately 0.5 to 1 ft bgs. Arsenic concentrations in confirmation samples were below the WRW soil AL.

The Building 707 slab was removed as part of the D&D project, including the Module C pit and all Building 707 sumps. In addition, the six autoclave vaults located in Module H were removed to several feet below the slab. The remaining walls and floors of the 12-ft-deep autoclave vaults were left in place. The building footers and foundations were not removed. OPWL were left in place and completely grouted with the exception of two sections of lines that were removed following slab removal. The ends of all OPWL left in place were completely grouted. The coolant oil line was removed north of the Module C-Pit, and the line south of the pit was left in place. Foundation drains were interrupted every 40 ft and left in place. Water lines located under the Building 707 slab were left in place. All remaining lines are deeper than 3 ft below final grade. As part of the D&D project, 44 soil samples were collected to verify that residual radioactivities were below RFCA WRW soil ALs. Results of the D&D soil sampling indicate remaining activities were well below the ALs. Building demolition, slab removal, results of verification sampling, and site reclamation are presented in the Decommissioning Closeout Report for the 707 Closure Project (DOE 2005a).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 707 based on the following:

- Surface soil analytical results were less than RFCA WRW soil ALs, with three exceptions noted above.
- Results of the elevated measurement comparison indicted that additional action was not warranted.
- Subsurface soil analytical results were all less than WRW soil ALs, with three exceptions noted above.
- Results of the SSRS did not indicate additional action was necessary.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-2 (DOE 2005c) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 707 on March 15, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-2, March 15.

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

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-04-02, IHSS Group 700-2, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2003b, Environmental Restoration RFCA Standard Operating Protocol Notification #04-05, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005a, Decommissioning Closeout Report for the 707 Closure Project, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005b, Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005c, Closeout Report for IHSS Group 700-2, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 731

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-2
Unit Name:	Building 707 Process Waste

This Final Update to the HRR for UBC 731 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 731 is summarized in this update. The following HRR volume contains UBC 731 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1970 to 2002

Historical Summary

The location of UBC 731 is shown on Figure 24. UBC 731 consisted of the basement area associated with Building 731, which was located in the courtyard east of Building 707. Building 731 was approximately 210 ft2 and consisted of a below-grade concrete vault that housed two 1,650-gallon fiberglass tanks (PAC 000-121 – OPWL, Tanks 11 and 30) and associated transfer pumps. Liquid process waste from Building 707 was stored in the tanks prior to being sent to Building 374 for treatment. The aqueous waste included water, acids, and chemical solutions that were potentially contaminated with plutonium and americium. The tanks underwent RCRA closure in 1995 (DOE 2000). Building 731 was demolished in early 2005 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the Decommissioning Closeout Report for the 707 Closure Project (DOE 2005a).

Soil and/or groundwater beneath the building may have become contaminated because of leaks and releases associated with the waste handling system, including waste lines. On August 28, 1991, the process waste tanks overflowed 750 gallons of process waste to secondary containment. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 731 was characterized as part of the IHSS Group 700-2 accelerated action (February 3, 2004 to December 15, 2004) in accordance with IASAP Addendum #IA-04-02 (DOE 2003). Subsurface soil samples were collected from two sampling locations adjacent to the structure (DOE 2005b). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicate all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003). The highest radionuclide activities above background are listed below.

- Uranium-234 – 5.9 pCi/g
- Uranium-235 – 0.31 pCi/g

- Uranium-238 – 5.9 pCi/g

Based on analytical results, no soil removal from under the building was required.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 731 based on the following:

- Subsurface soil analytical results were all less than RFCA WRW soil ALs. (Because the tanks in Building 731 were below grade, no surface soil samples were collected at UBC 731.)
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action is necessary.

After review of the Closeout Report for IHSS Group 700-2 (DOE 2005b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 731 on March 15, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-2, March 15.

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

DOE, 2000, Reconnaissance-Level Characterization Report (RLCR), Building 707 Cluster, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-04-02, IHSS Group 700-2, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005a, Decommissioning Closeout Report for the 707 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005b, Closeout Report for IHSS Group 700-2, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 770

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-5
Unit Name:	Waste Storage Facility

This Final Update to the HRR for UBC 770 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 770 is summarized in this update. The following HRR volumes contain UBC 770 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1965 to 2003

Historical Summary

The location of UBC 770 is shown on Figure 24. Building 770 was a metal, prefabricated, modular building constructed in 1965 on a concrete foundation. The building was used to store tools, materials, and supplies for Building 771 decommissioning operations. Historically, Building 770 was used for equipment storage and also as a facility for equipment assembly prior to equipment installation inside other Site buildings. Building 770 was also used to store radioactive waste. The building was demolished during 2004 as documented in the Decommissioning Closeout Report for the Building 771 Closure Project (DOE 2005). The slab was completely removed and managed as LLW.

In August 1972, a punctured scrap box stored inside Building 770 contaminated more than 3,000 ft^2 within the building and 500 ft^2 outside the building. Levels of radioactivity were measured up to 200,000 dpm. In September 1972, a 55-gallon drum containing spent radioactive ion exchange residue leaked onto the concrete floor inside Building 770. Also, drums with spent radioactive ion exchange residue (for processing in Building 771) and cargo containers were stored on the surface area located west of Building 770 from 1969 to 1974 when storage operations were moved to Building 776. Several contamination releases occurred on the ground surface located west of Building 770 between 1965 and 1971 and as discussed as part of PAC 700-150.1.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from waste containers, may have led to under building contamination. The building floor may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 770 was characterized as part of IHSS Group 700-5 (May 27, 2004 to June 1, 2004) in accordance with IASAP Addendum #IA-03-17 (DOE 2003). Surface and subsurface soil samples were collected from seven sampling locations (four under the building slab and three adjacent to the building (DOE 2004b). COCs included radionuclides, metals, VOCs, and PCBs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003). The highest radionuclide activities above background are listed below.

- Americium-241 – 6.7 pCi/g
- Uranium-234 – 5.0 pCi/g
- Uranium-235 – 0.31 pCi/g
- Uranium-238 – 5.0 pCi/g

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 770 based on the following:

- Surface and subsurface soil analytical results were less than RFCA WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Group 700-5 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 770 on September 7, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 700-5, September 7.

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

DOE, 2003, Final Industrial Area Sampling and Analysis Plan FY 2003 Addendum #IA-03-17, IHSS Group 700-5, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Data Summary Report for IHSS Group 700-5, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Decommissioning Closeout Report for the Building 771 Closure Project, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 771

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-4
Unit Name:	Plutonium and Americium Recovery Operations

This Final Update to the HRR for UBC 771 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 771 is summarized in this update. The following HRR volumes contain UBC 771 information:

Original Report – 1992 (DOE 1992);
Update Report – 2001 Annual (DOE 2001a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1952 to 1999

Historical Summary

The location of UBC 771 is shown on Figure 24. Building 771, the primary facility for plutonium operations, was one of the four major plutonium buildings at RFETS. Building 771 operations included the chemical and physical operations for recovering plutonium and refining plutonium metal, plutonium chemistry and metallurgical research, and a radiochemical analytical laboratory. The building was originally designed to perform aqueous recovery of plutonium from scrap (residues) and to conduct foundry casting operations to produce the components for nuclear weapons. Building 771 operations included machining necessary to produce parts ready for assembly. Other operations included americium recovery, HEPA filter processing, sludge and resin cementing, Part V leaching, skull metal burning, molten salt extraction processing, laboratory waste processing, graphite and fire brick scarfing, equipment size reduction, metal leaching, glovebox glove washing, tantalum metal leaching, plastic washing, wet ash hydrofluorination, process glass and leaching, Raschig ring washing, and Oralloy metal leaching. These processes all created plutonium solutions, heels, and sludges that contributed to the recovery of plutonium and converting it to metal.

Building 771 was located in the north-central section of RFETS. The original building was a two-story structure built into the side of a hill with most of the three sides covered by earth. The fourth side, facing the north, provided the main entrance to the building. Since completion of the original building, six major additions were constructed. This series of expansion brought the total area of the building to approximately 151,000 ft^2. The first floor contained the administrative areas, plutonium recovery processing, analytical laboratories, standards laboratory, R&D area, metal fabrication workshop, maintenance workshop, and four available docks. The second floor contained a chemical preparation area and the HVAC utilities support equipment, including Zone I and Zone II filter plenums, supply and exhaust fans, emergency generator, steam supply,

plant and instrument air, supplied breathing air, a boiler to produce steam and heat in case the main steam plant was shutdown, and one dock.

In September 1957, a fire started in a glovebox in Room 180 of Building 771 from some plutonium chips from a machining operation. The gloveboxes at that time had an air atmosphere and contained combustible materials. The gloveboxes were all connected by a conveyor line and air locks. The exhaust air system caused the fire to spread rapidly through the system and upstairs to the filter plenums, where burning of the HEPA filters also occurred.

In May 1969, a large fire occurred in Building 776. The fire lasted about three weeks. The fire department could not extinguish the fire outright; however, they controlled the burn with large volumes of water. This was significant to Building 771 because the tunnel that connected Building 771 with Building 776 received contaminated water from the fire fighting activities.

At the end of 1989, the mission of the building changed to closure activities such as characterization, draining of solutions from pipes and tanks, SNM consolidation and storage, and decontamination. Solutions were sent to Building 774 for neutralization and cementation to meet Waste Isolation Pilot Plant (WIPP) waste acceptance criteria. Resins were removed from several ion exchange columns in the building. The resins were bagged out of the gloveboxes, placed in 55-gallon drums, and put into backlog residue storage. Resins were leached using 0.35 percent nitric acid to remove the plutonium. Then the resins were cemented as a low level waste to meet WIPP waste acceptance criteria. The liquids generated were neutralized and cemented as low level waste.

Building 771 was demolished during 2004 as a Type 3 facility in accordance with an approved DOP (DOE 2003) and as documented in the Decommissioning Closeout Report for the Building 771 Closure Project (DOE 2005). Structures above 6 ft beneath the final grade were demolished and removed. Structures remaining include the southern wall, all of the first floor slab, and associated foundation components. The site's original grade was restored with backfill, which was covered with top soil. All areas were seeded for revegetation.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills, releases from process equipment or waste lines, and firefighting activities may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or be otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 771 was characterized twice: during a preliminary UBC characterization at UBC 771 during 2001, and as part of IHSS Group 700-4 characterization during 2002 and 2003 in accordance with IASAP Addendum #IA-03-01 (DOE 2002). Analytical results from 16 sampling locations during preliminary characterization (DOE 2001b) indicated plutonium-239/240 was present at an activity greater than WRW soil ALs at one location, location 12, at 2 - 4 ft below the building slab. The plutonium-239/240 activity was 157 pCi/g, and the WRW soil AL is 50 pCi/g. There were no other WRW soil AL exceedances.

During IHSS Group 700-4 characterization, subsurface soil samples were collected from 34 UBC 771 sampling locations (DOE 2004b). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated contaminant activities and concentrations were less than the

RFCA WRW soil ALs (DOE et al. 2003) with one exception. Plutonium-239/240 activity at sampling location CE47-003 (0.0 - 0.5 ft below the building slab) was 56.6 pCi/g. The next highest plutonium-239/240 activity was 29.8 pCi/g, and the highest americium-241 activity was 6.6 pCi/g. The highest uranium activities are listed below.

- Uranium-234 – 6.2 pCi/g
- Uranium-235 – 0.63 pCi/g
- Uranium-238 – 6.2 pCi/g

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 771 based on the following:

- Subsurface soil analytical results were less than RFCA WRW soil ALs, with two exceptions noted above. (No surface soil samples were collected.)
- Results of the SSRS did not indicate additional action was necessary. The two locations with plutonium-239/240 activities exceeding the WRW soil AL are located under the building slab, which is located at least 6 ft bgs.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the ER RSOP Notification and Closeout Report for IHSS Groups 700-4 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 771 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4, February 6.

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

DOE, 2001a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001b, Building 771 Phase 1 Under Building Contamination Characterization Sampling Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2003, 771 Closure Project Decommissioning Operations Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Groups 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005, Decommissioning Closeout Report for the Building 771 Closure Project, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 774

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-4
Unit Name:	Liquid Waste Process Treatment

This Final Update to the HRR for UBC 774 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 774 is summarized in this update. The following HRR volumes contain UBC 774 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1952 to 1999

Historical Summary

The location of UBC 774 is shown on Figure 24. Building 774 was designed to treat the liquid process wastes generated in Building 771. Building 774 was originally a two-story rectangular structure of poured-in-place concrete. By 1989, seven additions had been made to the building, resulting in multiple levels varying from one to four stories in height. The facility was built on a steeply sloping site. The first floor on the northern side was 7.5 ft below grade, and the fourth floor on the southern side was 4 ft above grade.

As RFETS expanded to accommodate increased production of nuclear weapon triggers, Building 774 began processing radioactive acidic wastes; caustics, aqueous and organic wastes; wastes oils; and nonradioactive waste photographic solutions. Buildings 111, 112, 130, 371, T371J, 441, 444, 460, 551, 559, 664, 707, 750, 771, 776, 777, 881, and 991 generated one or more waste streams that were processed in Building 774. In 1971, the waste treatment operations in Building 774 were enclosed to provide containment of radioactive airborne particles.

The goal of the Building 774 waste treatment process was to reduce liquid radioactive wastes and convert them into a form suitable for transport offsite for storage and disposal. In general, wastes were either piped directly into Building 774, or transferred in drums, containers, or other types of packaging. The waste entered a series of interconnected tanks designed to treat acidic, caustic, and radioactive wastes, and separate relatively low-level radioactive effluent from contaminated solids or sludges. Each of the four processes used in the building was tailored to meet certain characteristics of the waste. The waste may have passed through one or more of the following processes:

- Neutralization and filtration of acidic wastes containing large quantities of metal ions or chloride ions. The main purpose of this process was to remove the large quantities of metal hydroxide solids from the waste stream, as these solids hampered the decontamination ability of the succeeding flocculation and clarification processes.

- Batch neutralization, precipitation, and filtration of acidic wastes containing only small quantities of metal ions or basic wastes containing large quantities of undissolved solids.
- Continuous radioactive decontamination of neutral and caustic wastes.
- Solidification of aqueous wastes containing complexing agents, certain radioactive isotopes, or hazardous chemicals that were undesirable in the regular waste system. These wastes were mixed with an absorbent material and Portland cement in barrels for disposal. This process was eventually replaced by the organic and sludge immobilization system. The organic and sludge immobilization system accepted waste oils from any building at the Site that contained TRU material and converted the liquid waste into solid waste.

The role of Building 774 diminished with the inauguration of the new process waste treatment facility in Building 374. Building 774 continued to process contaminated organic wastes that could not be incinerated, and the liquid process wastes generated in Building 771.

Building 774 was demolished during 2004 as a Type 3 facility in accordance with an approved DOP (DOE 2003) and as documented in the Decommissioning Closeout Report for the Building 771 Closure Project (DOE 2005). The entire basement, including slab and foundation elements, remains except for the ceiling. The basement rooms were filled with flowable fill.

OPWL Tanks T-14 and T-16, southeast of Building 774, were removed and are addressed under PAC 000-121 (DOE 2004b).

Soil and/or groundwater beneath the building may have become contaminated because of leaks and releases associated with the waste handling systems, including waste lines and tanks. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 774 was characterized as part of IHSS Group 700-4 characterization during 2002 and 2003 in accordance with IASAP Addendum #IA-03-01 (DOE 2002). Subsurface soil samples were collected from 14 UBC 774 sampling locations (DOE 2004b). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003) with four exceptions. Plutonium-239/240 activities at sampling locations CG48-008 and CG48-009 (0.0 – 0.5 ft below the building slab) were 1,690 and 943.8 pCi/g, respectively, and the WRW soil AL is 50 pCi/g. Americium-241 activities at sampling locations CG48-008 and CG48-009 (0.0 – 0.5 ft below the building slab) were 1,220 and 116.4 pCi/g, respectively, and the WRW soil AL is 76 pCi/g. The next highest plutonium-239/240 and americium-241 activities were 14.2 and 24.1 pCi/g, respectively. The highest uranium activities are listed below.

- Uranium-234 – 5.3 pCi/g
- Uranium-235 – 0.34 pCi/g
- Uranium-238 – 5.3 pCi/g

Based on the analytical results and the SSRS, no accelerated action soil removal was required. After D&D activities were completed, the two locations exceeding the plutonium-239/240 and americium-241 ALs were at least 6 ft bgs. (Sample start depths for these locations are shown as

0.0 ft in the Soil Water Database [SWD]; however, these depths are the surface of the excavation bottom.)

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 774 based on the following:

- Subsurface soil analytical results were less than RFCA WRW soil ALs, with four exceptions noted above. (No surface soil samples were collected.)
- Results of the SSRS did not indicate additional action was necessary. Locations with americium-241 and plutonium-239/240 activities exceeding the WRW soil AL are located at least 6 ft bgs.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the ER RSOP Notification and Closeout Report for IHSS Groups 700-4 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 774 on February 6, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: ER RSOP Notification and Closeout Report for IHSS Group 700-4, February 6.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2003, 771 Closure Project Decommissioning Operations Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, ER RSOP Notification and Closeout Report for IHSS Groups 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005, Decommissioning Closeout Report for the Building 771 Closure Project, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 776

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-3
Unit Name:	Original Plutonium Foundry

This Final Update to the HRR for UBC 776 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 776 is summarized in this update. The following HRR volumes contain UBC 776 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1958 to 1999

Historical Summary

The location of UBC 776 is shown on Figure 24. Building 776/777, which went into service in 1958, was the main manufacturing facility for plutonium weapons components and housed plutonium foundry and fabrication operations (DOE 2005a). Following a major fire in Building 776/777 in 1969, the majority of the foundry and fabrication operations were transferred to Building 707. After the fire, the main focus of building operations was shifted to waste and residue handling, disassembly of retired weapons components, and special projects. Processes conducted in Building 776 included size reduction of contaminated gloveboxes and miscellaneous large equipment for waste disposal, pyrochemistry, coatings operations, and test runs of a fluidized-bed incinerator. Since the facility was first occupied, 10 major modifications/additions were made to update the building and/or provide increased safety.

In June 1964, an explosion in Building 776 resulted in the release of plutonium. One account claimed that an area approximately 1,500 ft^2 adjacent to the Building 776 gas-bottle dock was affected (western end of the northern side of Building 776). Radiological surveys showed activities exceeding 300,000 dpm/100 cm^2. A later account claimed that an area of approximately 40 ft^2 north of Building 776 was affected. Soil from the area with the highest counts was removed, a seal coat of oil was applied, and approximately 2 inches of gravel were added.

On May 11, 1969, at 2:27 p.m., a fire started in the Building 776 north plutonium foundry glovebox line as a result of spontaneous ignition of a briquette of scrap plutonium alloy metal. The fire spread through up to 150 connecting gloveboxes in Building 776 and the assembly line in Building 777. The fire was brought under control by 6:30 p.m. Fearing a breach in the building's outer walls, firefighters used water to control the blaze. This was the first time water was used directly on burning plutonium, and it did not create a nuclear criticality.

An airborne plutonium release of approximately 0.000012 g (0.0002 curie) was estimated, all of it contained on site. The operating areas in Building 776/777 suffered extensive damage and decontamination took 2 years to complete. The incident resulted in significant safety improvements in glovebox operations, including installation of water sprinklers and firewalls to control the spread of fire, and the use of inert atmospheres for plutonium operations to prevent spontaneous ignition.

UBC Investigation

UBC 776 was characterized in accordance with IASAP Addendum #IA-03-04 (DOE 2003b). Surface and subsurface soil samples were collected from 72 UBC 776 sampling locations (DOE 2005a). COCs included radionuclides, metals and/or VOCs based on sampling targets and process knowledge. Analytical results indicated americium-241 and plutonium-239/240 activities were greater than RFCA WRW soil ALs (DOE et al. 2003) at several surface and subsurface locations. All uranium activities and metal and VOC concentrations were less than WRW soil ALs.

Soil contamination indicated by the initial characterization and sampling conducted during building demolition was removed as part of the IHSS Group 700-3 RFCA accelerated action (DOE et al. 1996) in accordance with an approved ER RSOP Notification (DOE 2004). The most contaminated soil was removed during March and April 2005 while the 776/777 structure was still in place. Additional soil removal and sampling was conducted after the 776/777 structure was removed during July and August 2005. Most of the soil removal occurred within the Building 776 footprint where 2 - 3 ft of soil was removed at this time. Additional soil was removed when subsurface structures were being removed. Approximately 6,400 cy of soil were removed from UBCs 776, 777 and 778.

Thirty-seven confirmation samples were collected across the UBC to determine whether residual activities and concentrations were below the RFCA WRW soil ALs or were acceptable based on RFCA and the SSRS (DOE 2005a, DOE et al. 2003). Several of the sampling locations were statistical locations based on a 50-ft grid size. Samples were analyzed onsite using gamma spectroscopy, and 20 percent of the samples were analyzed offsite using alpha spectroscopy. Offsite alpha spectroscopy samples included those collected from areas believed to have the highest residual activities.

Characterization and confirmation results indicate most residual radionuclide activities were less than WRW soil ALs; however, 13 sampling locations, located more than 3 ft below final grade, had plutonium-239/240 activities greater than the AL (50 pCi/g) (DOE 2005a). Residual plutonium activities greater than the WRW soil AL range from 52.1 to 856.7 pCi/g. The location with the highest plutonium-239/240 activity also has an americium-241 activity greater than the WRW soil AL (76 pCi/g) (at 150.3 pCi/g measured using gamma spectroscopy). Areas with exceedances include the following.

- An area in the northwestern corner of UBC 776 associated with a pipe chase;
- The excavation area associated with removal of the elevator shaft;
- The excavation area associated with the removal of the 776/777 basement and C- and D-Pits;
- A small area associated with the removal of OPWL north of UBC 776; and
- A small area in the southwestern corner of UBC 776.

Residual activities exceeding WRW soil ALs are presented by sampling location below.

- At CF46-065, plutonium-239/240 was detected at 53.4 pCi/g at a depth of 8 to 9 ft bgs; the WRW soil AL is 50 pCi/g.
- At CE46-073, plutonium-239/240 was detected at 66.5 pCi/g at a depth of 9 to 9.5 ft bgs; the WRW soil AL is 50 pCi/g.
- At CE46-074, plutonium-239/240 was detected at 52.1 pCi/g at a depth of 9 to 9.5 ft bgs; the WRW soil AL is 50 pCi/g.
- At CE46-075, americium-241 was detected at 150.3 pCi/g at a depth of 9 to 9.5 ft bgs; the WRW soil AL is 76 pCi/g.
- At CE46-075, plutonium-239/240 was detected at 856.7 pCi/g at a depth of 9 to 9.5 ft bgs; the WRW soil AL is 50 pCi/g.
- At CE46-076, plutonium-239/240 was detected at 288.6 pCi/g at a depth of 9 to 9.5 ft bgs; the WRW soil AL is 50 pCi/g.
- At CE46-077, plutonium-239/240 was detected at 247.4 pCi/g at a depth of 9 to 9.5 ft bgs; the WRW soil AL is 50 pCi/g.
- At CE46-092, plutonium-239/240 was detected at 62.0 pCi/g at a depth of 0 to 0.3 ft (measured from the bottom of an excavation); the WRW soil AL is 50 pCi/g.
- At CE45-114, plutonium-239/240 was detected at 57.1 pCi/g at a depth of 0 to 0.3 ft (measured from the bottom of an excavation); the WRW soil AL is 50 pCi/g.
- At CE45-118, plutonium-239/240 was detected at 118.7 pCi/g at a depth of 0 to 0.3 ft (measured from the bottom of an excavation); the WRW soil AL is 50 pCi/g.
- At CE45-128, plutonium-239/240 was detected at 183.0 pCi/g at a depth of 0 to 0.3 ft (measured from the bottom of an excavation); the WRW soil AL is 50 pCi/g.
- At CF45-128, plutonium-239/240 was detected at 417.6 pCi/g at a depth of 15 to 16 ft bgs; the WRW soil AL is 50 pCi/g.
- At CF45-129, plutonium-239/240 was detected at 90.3 pCi/g at a depth of 3 to 15 ft bgs; the WRW soil AL is 50 pCi/g.
- At CF45-130, plutonium-239/240 was detected at 123.4 pCi/g at a depth of 3 to 15 ft bgs; the WRW soil AL is 50 pCi/g.

Soil with americium-241 and plutonium-239/240 activities exceeding WRW soil ALs did not require additional excavation because exceedances occurred at depths between 3 and 6 ft below final grade and were less than 1 nCi/g, or exceeded 1 nCi/g but occurred at a depth greater than 6 ft below final grade (DOE et al. 2003).

Structural components and drain lines associated with Buildings 776 and 777, including the 776/777 slab, basement, equipment pits, waste lines, pipe chases, sumps, and foundation features such as caissons and footer walls, were removed as part of the 776/777 Closure Project in accordance with an approved DOP and as documented in the Decommissioning Closeout Report for the 776/777 Closure Project (DOE 2005b).

Several large, deep excavations were required for the 776/777 Closure Project (DOE 2005a). The excavation depths associated with the basement, C-Pit, D-Pit and E-Pit were 20 - 25, 16, 30, and 12 ft deep, respectively. A large excavation was also required to remove the elevator shaft located in the northwestern part of UBC 776. Soil samples were collected from these excavations, and some soil was removed. Confirmation samples were collected from these areas, and excavations were backfilled with clean soil from under the building slabs and clean imported fill.

To reduce the amount of groundwater flow through the tunnel between Buildings 776 and 771, the tunnel entrance on the Building 776 side was blocked by crushing the end of the existing tunnel and placing approximately 30 cy of concrete onto the crushed end, forming a layer 1.5 to 2 ft thick. A bentonite cutoff wall was then placed in front of the tunnel opening that extended laterally beyond the fill material underlying and surrounding the tunnel. These steps will minimize groundwater flow both within the tunnel and within the associated fill material surrounding the tunnel. After the cutoff wall was installed, the excavation was backfilled (DOE 2005a).

During building demolition, a significant amount of water was applied to control dust and the spread of contamination. This water was collected by temporary trenches into a central sump and pumped through a pipeline to a temporary, lined retention pond located at the site of former Building 779. The water was then re-applied to control dust during demolition activities. The pond was roughly 100 ft by 100 ft, and the berms were 8 ft high. After the demolition, the water in the pond was removed and appropriately treated. The pond liner and remaining sediment were removed and disposed of as LLW. The bermed area and surrounding areas were sampled, and soil with contaminant activities and concentrations greater than RFCA WRW soil ALs were removed. After confirmation sampling was completed, the berms were graded to conform to final land configuration (DOE 2005a).

During both demolition and soil removal activities, erosion controls were used to prevent wind and rain from spreading contamination (DOE 2005a). This included placing an earthen berm around the entire project site and restricting access. Wattles were also placed outside the berm to control runoff from the area.

The excavated contaminated soil was temporarily staged to facilitate railcar loading in the northeastern corner of the Building 777 footprint in an area approximately 100 by 100 ft. Water was also applied to the waste pile as necessary to control dust and minimize contaminant migration. The waste was shipped out in railcars to Envirocare. The area was then sampled, and soil with contaminant activities and concentrations greater than RFCA WRW soil ALs were removed. After confirmation sampling was completed, the area was graded (DOE 2005a).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 776 based on the following:

- Analytical results were less than RFCA WRW soil ALs with the exceptions noted above.
- Results of the SSRS did not indicate additional action was necessary because locations with americium-241 and plutonium-239/240 activities exceeding the WRW soil ALs occurred at depths between 3 and 6 ft below final grade or greater, and were less than 1 nCi/g. Also, the area is not susceptible to high erosion.

- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Groups 700-3, Volume II (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for the UBC 776 on October 12, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Rampe, DOE RFPO, from C. Spreng, CDPHE, RE: Closeout Report for IHSS Group 700-3. Volume II, October 12.

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DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #04-04, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005a, Closeout Report for IHSS Group 700-3, Volume II, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005b, Decommissioning Closeout Report for the 776/777 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 777

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-3
Unit Name:	General Plutonium Research and Development

This Final Update to the HRR for UBC 777 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 777 is summarized in this update. The following HRR volumes contain UBC 777 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1958 to 1999

Historical Summary

The location of UBC 777 is shown on Figure 24. Building 776/777, which went into service in 1958, was the main manufacturing facility for plutonium weapons components and housed plutonium foundry and fabrication operations (DOE 2005a). Following a major fire in Building 776/777 in 1969, the majority of the foundry and fabrication operations were transferred to Building 707. After the fire, the main focus of building operations was shifted to waste and residue handling, disassembly of retired weapons components, and special projects. Processes conducted in Building 776 included size reduction of contaminated gloveboxes and miscellaneous large equipment for waste disposal, pyrochemistry, coatings operations, and test runs of a fluidized-bed incinerator. Since the facility was first occupied, 10 major modifications/additions were made to update the building and/or provide increased safety.

On May 11, 1969, at 2:27 p.m., there was a fire started in the Building 776 north plutonium foundry glovebox line as a result of spontaneous ignition of a briquette of scrap plutonium alloy metal. The fire spread through up to 150 connecting gloveboxes in Building 776 and the assembly line in Building 777. The fire was brought under control by 6:30 p.m. Fearing a breach in the building's outer walls, firefighters used water to control the blaze. This was the first time water was used directly on burning plutonium, and it did not create a nuclear criticality.

An airborne plutonium release of approximately 0.000012 g (0.0002 curie) was estimated, all of it contained onsite. The operating areas in Building 776/777 suffered extensive damage and decontamination took 2 years to complete. The incident resulted in significant safety improvements in glovebox operations, including installation of water sprinklers and firewalls to control the spread of fire, and the use of inert atmospheres for plutonium operations to prevent spontaneous ignition.

UBC Investigation

UBC 777 was characterized in accordance with IASAP Addendum #IA-03-04 (DOE 2003b). Surface and subsurface soil samples were collected from 45 UBC 777 sampling locations (DOE 2005a). COCs included radionuclides, metals and/or VOCs based on sampling targets and process knowledge. Analytical results indicated plutonium-239/240 activities were greater than RFCA WRW soil ALs (DOE et al. 2003) at six surface and subsurface locations. All americium and uranium activities and metal and VOC concentrations were less than WRW soil ALs.

Soil contamination indicated by characterization was removed as part of the IHSS Group 700-3 RFCA accelerated action (DOE et al. 1996) in accordance with an approved ER RSOP Notification (DOE 2004). Much of the surface soil within the western part of the Building 777 footprint was removed at this time. Additional soil was removed when subsurface structures were being removed. Approximately 6,400 cy of soil were removed from UBCs 776, 777, and 778.

Thirty-seven confirmation samples were collected across the UBC to determine whether residual activities and concentrations were below the RFCA WRW soil ALs or were acceptable based on RFCA and the SSRS (DOE 2005a, DOE et al. 2003). Several of the sampling locations were statistical locations based on a 50-ft grid size. Samples were analyzed on site using gamma spectroscopy, and 20 percent of the samples were analyzed offsite using alpha spectroscopy. Offsite alpha spectroscopy samples included those collected from areas believed to have the highest residual activities.

Characterization and confirmation results indicate most residual radionuclide activities are below WRW soil ALs; however, six subsurface sampling locations within UBC 777 have plutonium-239/240 activities greater than the WRW soil AL (50 pCi/g) (DOE 2005a). Residual plutonium activities range from 62.2 to 292.9 pCi/g. Exceedances occur in the excavation area associated with the removal of the 776/777 basement. Residual activities exceeding the WRW soil AL are presented below.

- At CF45-118, plutonium-239/240 was detected at 215.0 pCi/g at a depth of 0 to 0.3 ft bgs (measured from the bottom of an excavation); the WRW soil AL is 50 pCi/g.
- At CF45-119, plutonium-239/240 was detected at 252.1 pCi/g at a depth of 0 to 0.3 ft bgs (measured from the bottom of an excavation); the WRW soil AL is 50 pCi/g.
- At CF45-154, plutonium-239/240 was detected at 292.9 pCi/g at a depth of 30 to 32 ft bgs; the WRW soil AL is 50 pCi/g.
- At CF45-155, plutonium-239/240 was detected at 103.9 pCi/g at a depth of 30 to 32 ft bgs; the WRW soil AL is 50 pCi/g.
- At CF45-156, plutonium-239/240 was detected at 289.1 pCi/g at a depth of 30 to 32 ft bgs; the WRW soil AL is 50 pCi/g.
- At CF45-172, plutonium-239/240 was detected at 62.2 pCi/g at a depth of 11.5 to 11.8 ft bgs; the WRW soil AL is 50 pCi/g.

Because plutonium-239/240 activities were less than 1 nCi/g and occurred at depths greater than 3 ft below final grade, and 3 ft of soil had already been removed, additional excavation of this soil was not required (DOE et al. 2003).

Structural components and drain lines associated with Buildings 776 and 777, including the 776/777 slab, basement, equipment pits, waste lines, pipe chases, sumps, and foundation features such as caissons and footer walls, were removed as part of the 776/777 Closure Project in accordance with an approved DOP and as documented in the Decommissioning Closeout Report for the 776/777 Closure Project (DOE 2005b).

Several large, deep excavations were required for the 776/777 Closure Project, including the basement (DOE 2005a). The excavation associated with the basement was 20 – 25 ft. Soil samples were collected from this large excavation, and some soil was removed. Confirmation samples were collected from the area, and the excavation was backfilled with clean soil from under the building slabs and clean imported fill.

During building demolition, a significant amount of water was applied to control dust and the spread of contamination. This water was collected by temporary trenches into a central sump and pumped through a pipeline to a temporary, lined retention pond located at the site of former Building 779. The water was then re-applied to control dust during demolition activities. The pond was roughly 100 ft by 100 ft, and the berms were 8 ft high. After the demolition, the water in the pond was removed and appropriately treated. The pond liner and remaining sediment were removed and disposed as waste. The bermed area and surrounding areas were sampled, and soil with contaminant activities and concentrations greater than RFCA WRW soil ALs were removed. After confirmation sampling was completed, the berms were graded to conform to final grade specifications (DOE 2005a).

During both demolition and soil removal activities, erosion controls were used to prevent wind and rain from spreading contamination (DOE 2005a). This included placing an earthen berm around the entire project site and restricting access. Wattles were also placed outside the berm to control runoff from the area.

The excavated contaminated soil was temporarily staged to facilitate railcar loading in the northeastern corner of the Building 777 footprint in an area approximately 100 by 100 ft. Water was also applied to the waste pile as necessary to control dust and minimize contaminant migration. The waste was shipped out in railcars to Envirocare. The area was then sampled, and soil with contaminant activities and concentrations greater than RFCA WRW soil ALs were removed. After confirmation sampling was completed, the area was graded (DOE 2005a).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 777 based on the following:

- Analytical results were less than RFCA WRW soil ALs with the exceptions noted above.
- Results of the SSRS did not indicate additional action was necessary because residual plutonium-239/240 activities exceeding the WRW soil ALs were less than 1 nCi/g and occurred at depths greater than 3 ft below final grade, and the area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Groups 700-3, Volume II (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 777 on October 12, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Rampe, DOE RFPO, from C. Spreng, CDPHE, RE: Closeout Report for IHSS Group 700-3. Volume II, October 12.

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

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #04-04, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005a, Closeout Report for IHSS Group 700-3, Volume II, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005b, Decommissioning Closeout Report for the 776/777 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 778

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	700-3
Unit Name:	Plant Laundry Facility

This Final Update to the HRR for UBC 778 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 778 is summarized in this update. The following HRR volume contains UBC 778 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1957 to 2000

Historical Summary

The location of UBC 778 is shown on Figure 24. Building 778 was a metal building, located between Building 707 and Building 776/777. It was constructed in 1957 as a support facility for the 700 Complex plutonium production buildings (DOE 2005a). The building provided all-weather access to Buildings 707 and 776/777 through two enclosed corridors. It also contained a portion of the chainveyor that was used to transport material between production areas in Buildings 707 and 776/777. In addition, the building housed the maintenance shops (electric, machine, sheet metal, paint, and pipe shops) and the locker/shower facilities for those buildings. A laundry facility was added to the building when plutonium laundry operations were consolidated on site. Laundry wastewater was sent to Building 774 and later to Building 374.

Structural components and drain lines associated with Building 778, including the slab, waste lines, and foundation features such as caissons and footer walls, were removed during 2005 as part of the 707 Closure Project in accordance with an approved Facility Disposition RSOP Notification and as documented in the Decommissioning Closeout Report for the 707 Closure Project (DOE 2005b).

UBC Investigation

UBC 778 was characterized in accordance with IASAP Addendum #IA-03-04 (DOE 2003). Surface and subsurface soil samples were collected from 27 UBC 778 sampling locations (DOE 2005a). COCs included radionuclides, metals and/or VOCs based on sampling targets and process knowledge. Analytical results indicated plutonium-239/240 activities were greater than RFCA WRW soil ALs (DOE et al. 2003) at one surface location within the UBC (at 55 pCi/g versus the WRW AL of 50 pCi/g) and at two surface locations just north of the UBC (at 56 pCi/g and 68 pCi/g vs the WRW AL of 50 pCi/g). All americium-241 and uranium activities and metal and VOC concentrations were less than WRW soil ALs.

Soil contamination indicated by the initial characterization and sampling conducted during building demolition was removed as part of the IHSS Group 700-3 RFCA accelerated action (DOE et al. 1996) in accordance with an approved ER RSOP Notification (DOE 2004, DOE 2005a). Much of the surface soil within the northern part of the Building 778 footprint was removed. Fourteen confirmation samples were collected to ensure that residual activities were less than the RFCA WRW soil AL (DOE 2005a, DOE et al. 2003). All contaminant activities were less than WRW soil ALs with one exception. The plutonium-239/240 activity at sampling location CE45-134, at a depth greater than 3 ft bgs, was 51.9 pCi/g, and the WRW soil AL is 50 pCi/g. The next highest plutonium-239/240 activity was 38.5 pCi/g, and the highest americium-241 activity is 29.2 pCi/g. The highest uranium activities are listed below.

- Uranium-234 – 16.4 pCi/g
- Uranium-235 – 0.89 pCi/g
- Uranium-238 – 61.4 pCi/g

The excavation was backfilled with clean soil from under the building slab and clean imported fill.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 778 based on the following:

- Residual activities and concentrations were less than RFCA WRW soil ALs, with the one subsurface exception noted above.
- Results of the SSRS do not indicate additional action was necessary because the area is not susceptible to high erosion. The one sample with the plutonium-239/240 activity greater than the AL is located more than 3 ft bgs.
- Results of the stewardship evaluation do not indicate additional action was necessary.

After review of the Closeout Report for IHSS Groups 700-3, Volume II (DOE 2005a) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 778 on October 12, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Rampe, DOE RFPO, from C. Spreng, CDPHE, RE: Closeout Report for IHSS Group 700-3. Volume II, October 12.

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

DOE, 2003, Final Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #04-04, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005a, Closeout Report for IHSS Group 700-3, Volume II, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2005b, Decommissioning Closeout Report for the 707 Closure Project, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 779

IHSS Number:	Not Applicable
Current Operable Unit:	Not Applicable
Former Operable Unit:	Not Applicable
IHSS Group:	700-7
Unit Name:	Main Plutonium Components Production Facility

This Final Update to the HRR for UBC 779 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 779 is summarized in this update. The following HRR volumes contain UBC 779 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1965 to 1998

Historical Summary

The location of UBC 779 is shown on Figure 24. Building 779 was the former weapons R&D laboratory, built in 1965 to support plutonium production and recovery processes. The building mission changed in 1989 to research and non-nuclear production support activities, such as liquid carbon dioxide cleaning, waste minimization, and characterization, stockpile reliability evaluation, and surface analyses.

Research, development, and support operations consisted of process chemistry technology, physical metallurgy, machining and gauging, joining technology, and hydriding (plutonium recovery) operations. The Process Chemistry Technology group engaged in weapons process development, stockpile reliability testing, testing of various material compatibilities, plutonium aging under various environmental conditions, and methods development for recovering, separating, and purifying actinides from waste streams and residues. The Physical Metallurgy group conducted research on various metals, alloys, and other materials, which involved tensile testing, study of casting dynamics, electron microscopy, x-ray analyses, hardness testing, and dimensional dynamics. The Machining and Gauging group was involved in manufacturing of special order parts and test components, and had two shops and a laboratory for tool making, maintenance operations, and high-precision machining for special orders and tests. The Joining group developed sophisticated joining techniques, including welding and brazing, for nuclear materials. The Hydriding group was involved in plutonium recovery experiments.

Building 779 was demolished to its main foundation in FY2000. Building components that were not removed at the time included the building slab, an extensive network of OPWL, process waste trenches, tank and equipment pits, sanitary drains, two elevator shafts, and various site utilities. Process waste drains penetrating the foundation were filled to grade with grout. Pipe conduit openings in the building slab were plugged and grouted at the foundation level. Contaminated groundwater was encountered in Pit 1A.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

After building demolition, based on elevated activity levels detected during demolition, a 35-ft by 2.5-ft area of concrete slab was removed at the northern sides of Rooms 131 and 133 (central portion of the building slab). Soil samples were collected from beneath the concrete prior to backfilling the area with grout. Plutonium-239/240 was detected in soil at activities of up to 97,320 pCi/g (DOE 2000). No soil remediation was conducted at that time.

UBC 779 was fully characterized as part of the IHSS Group 700-7 acceleration action (September 30, 2003 to August 18, 2004) in accordance with IASAP Addendum #IA-03-15 (DOE 2003a). Surface and subsurface soil samples were collected from 41 sampling locations (DOE 2004b). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003) with the following six exceptions:

- Plutonium-239/240 activities exceeded the WRW soil AL (50 pCi/g) at CH45-094 (670.32 pCi/g at 0.0 to 0.5 ft bgs and 149.63 pCi/g at 0.5 to 1.0 ft bgs).
- Plutonium-239/240 activities exceeded the WRW soil AL (50 pCi/g) at CH45-112 (299.08 pCi/g at 0.0 to 0.5 ft bgs and 119.17 pCi/g at 12 to 13.5 ft bgs).
- Americium-241 activities exceeded the WRW soil AL (76 pCi/g) at CH45-094 (117.6 pCi/g at 0.0 to 0.5 ft bgs).
- Arsenic concentration exceeded the WRW soil AL (22.2 mg/kg) at CI45-012 (24 mg/kg at 0.5 to 2.5 ft bgs).

During the RFCA accelerated action (DOE et al. 1996), the Building 779 slab and most of the other building structural features, including footer walls (except one), some of the structural upgrades, the top 4 ft of the basement walls, and waste trenches and pits, were removed in accordance with ER RSOP Notification #03-10 (DOE 2003b). Water and waste lines, including OPWL and sanitary lines under the Building 779 slab, were also removed.

Extensive soil removal was also conducted to remove contaminated soil detected during historical and accelerated action characterization and during removal of structural features. More than 150 cy were removed from beneath the building contamination area, and approximately 5 cy were removed from an area adjacent to a vertical sanitary line. Confirmation sampling results indicate plutonium activities exceed the WRW soil AL (50 pCi/g) at three subsurface locations:

- 87 pCi/g at 5.0 to 5.5 ft bgs at CH45-106;
- 79.6 pCi/g at 5.0 to 5.5 ft bgs at CH45-146; and
- 59.3 pCi/g at 4.0 to 4.5 ft bgs at CH45-147.

However, activities were less than 1 nCi/g at a depth greater than 3 ft from the ground surface. Based on RFCA Attachment 5 and the SSRS, additional soil removal at these locations was not required. The area is not susceptible to high erosion.

Additional soil removal was also conducted east of the UBC, as listed below:

- Removed approximately 12 cy of radiologically contaminated soil around the section of OPWL that was broken near the Building 784 slab during the accelerated action. The depth of the excavation was approximately 3.5 ft. Refer to the PAC 700-149.2 HRR writeup.
- Removed approximately 81 cy of PCB-contaminated soil around and under the PCB transformer pads. The depth of the excavation was approximately 5 to 6 ft and covered an area approximately 20 by 20 ft. Refer to PAC 700-1105 HRR writeup.
- Approximately 12 cy of radiologically contaminated soil was removed around three "hot spots" detected in the area of the former SEP Auxiliary Pond 2 (at sampling locations CI46-013, CI46-014 and CI46-029). The approximate depths of the excavations were 2.5 ft at sampling locations CI46-013, 3.5 ft at sampling location CI46-014, and 3.5 ft at sampling location CI46-029. The soil was disposed of as LLW. Confirmation sampling results at the three "hot spots" indicate that residual plutonium-239/240 activities exceed the WRW AL; however, activities are located at depths greater than 3 ft below final grade and at activities less than 1 nCi/g (at sampling locations CI46-041, CI46-043, CI46-044 and CI46-046). Activities range from 79.6 to 527 pCi/g.

Building components remaining bgs include some Building 779 structural upgrade foundations (intact or lower portions), caissons for the structural upgrade foundations and elevator pits, the lower portion of the Building 779 basement, the footer wall supporting the basement staircase, the Building 779 sub-basement, the footer wall on the western side of the Building 779 slab, and the Building 782 tunnel/utility corridor and pit. The Building 779 basement and sub-basement and the Building 782 tunnel and pit were filled with flowable-fill concrete to prevent subsidence in the future, prevent groundwater intrusion, and immobilize any fixed contamination in the Building 779 sub-basement pits.

Clean fill was brought to the project site and used to backfill excavations and smooth out the surface to prevent large-scale ponding of precipitation. Additional fill was later brought in to bring the area to final grade and ensure that all remaining structural features (remaining structural upgrades and the Building 782 tunnel) were 3 ft below final grade. Final grading and subsequent seeding occurred as part of the Sitewide land reconfiguration. Reconfiguration resulted in surface runoff from the IHSS Group draining south into the South Walnut Creek drainage.

No Further Action Recommendation

Accelerated action data indicated residual COC concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with eight exceptions. As indicated above, plutonium-239/240 activities exceeded the WRW soil AL (50 pCi/g) at eight subsurface locations. However, activities were less than 1 nCi/g at a depth greater than 3 ft below final grade. Based on RFCA and the SSRS, additional soil removal at these locations was not required. IHSS Group-specific, near-term management techniques required included: bringing in clean fill to ensure that all remaining structural features are at least 3 ft below final grade, continuing water quality monitoring at

GS32 and SW093 (and along South Walnut Creek after land reconfiguration), and installing erosion controls as necessary as part of land reconfiguration.

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 779 based on the following:

- Residual contaminant activities and concentrations in surface soil were less than WRW soil ALs.
- Residual contaminant activities and concentrations in subsurface soil were less than WRW soil ALs with eight exceptions. Plutonium activities exceed the WRW soil AL (50 pCi/g) at eight locations; however, activities were less than 1 nCi/g at a depth greater than 3 ft below final grade.
- Results of the SSRS did not indicate additional action was necessary.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 700-7 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 779 on October 1, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 700-7, October 1.

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

DOE, 2000, Decommissioning Closeout Report for the 779 Closure Project, Revision 0, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2003a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-15, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2003b, Environmental Restoration RFCA Standard Operating Protocol Notification #03-10, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Closeout Report for IHSS Group 700-7, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 865

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-1
Unit Name:	Materials Process Building

This Final Update to the HRR for UBC 865 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 865 is summarized in this update. The following HRR volumes contain UBC 865 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1970 to 2000

Historical Summary

The location of UBC 865 is shown on Figure 24. Building 865, built in 1970, was part of the Plant R&D program. The building housed metalworking equipment for the study of non-plutonium metals and the development of alloys and prototype hardware. Operations included metalworking, machining, and metallurgical laboratory operations. The most common metals processed were depleted uranium, steel, and aluminum. Other metals worked in the building included copper, molybdenum, beryllium, titanium, silver, niobium, tantalum, gold, iridium, platinum, vanadium, tungsten, and alloys of these metals.

All metalworking operations were conducted in the high-bay area. Metalworking processes included arc and vacuum induction melting, hammer forging, press forming, hydrospinning, swaging, extruding, drawing, rolling, diffusion bonding, furnace heat treating, salt bath and glovebox operations, and cutting and shearing.

Operations involving beryllium were conducted inside and outside gloveboxes. High-purity beryllium was produced and canned (sealed in a can) in gloveboxes. Beryllium chips from lathe operations were processed in two types of mills (ball mill and fluid energy mill) to form a powder. The powder was then sealed into stainless steel containers in preparation for further processing.

Machining operations included milling, grinding, drilling, and cutting. The machine shop was equipped with standard equipment, including surface grinders, drill presses, and saws. Other equipment in the machine shop was specialized; lathes and milling machines in the shop were equipped with tracers.

Personnel in the metallurgy laboratory, located in the northeastern corner of the building, conducted mechanical testing of metals and prepared metal samples for examination. Samples

were prepared for macroscopic and microscopic examination by sawing, cutting, mounting, grinding, polishing, and etching operations.

The final use of the building was to conduct metallography laboratory work and decontamination activities for the product R&D group.

Building 865 was demolished to its main foundation slab as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification during 2003 and as documented in the Final Project Closeout Report for the Building 865 Cluster (DOE 2004b). A portion of the High Bay slab was contaminated with depleted uranium (DOE 2004c), and that portion of the slab was sprayed with Instacote™ prior to building demolition. Process waste drains penetrating the foundation were filled to grade with grout prior to building D&D. Pipe conduit openings in the building slab were plugged and grouted at the foundation level.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building. Uranium and beryllium contamination was found throughout building surfaces; however, remaining contamination after decontamination was fixed prior to building demolition.

UBC Investigation

UBC 865 was characterized as part of IHSS Group 800-1 (August 14, 2003 to December 12, 2003) in accordance with IASAP Addendum #IA-03-01 (DOE 2002). Surface and subsurface soil samples were collected from 55 sampling locations under the building slab (DOE 2004c). COCs included radionuclides, metals, and VOCs. Analytical results indicated contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2003), except for one subsurface arsenic concentration. The arsenic concentration was 25.5 mg/kg between 18.5 and 20.5 ft bgs, and the WRW AL is 22.2 mg/kg. The highest radionuclide activities above background are listed below.

- Americium-241 – 0.06 pCi/g
- Plutonium-239/240 – 0.16 pCi/g
- Uranium-234 – 7.1 pCi/g
- Uranium-235 – 0.52 pCi/g
- Uranium-238 – 7.1 pCi/g

The Building 865 slab and other structural features were removed from October 7 to December 18, 2003, as a RFCA accelerated action (DOE et al. 1996) in accordance with ER RSOP Notification #03-12 (DOE 2003). Activities included removal of concrete slabs, foundation walls, process waste lines, and equipment pits associated with Building 865 (DOE 2004c). All contaminated structural features were removed, including slab sections, pits, and waste lines. Remaining features include the bottom of building caissons, the bottom of the footer wall for the western side of the High Bay, a large equipment pedestal 3 ft bgs, and sections of foundation drains. Clean fill was brought to the project site and used to backfill excavations and bring the area to final grade.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 865 based on the following:

- Surface soil analytical results were all less than RFCA WRW soil ALs.
- Subsurface soil analytical results were less than WRW soil ALs, with one exception noted above.
- Results of the SSRS did not indicate additional action was necessary. The elevated arsenic concentration is located between 18.5 and 20.5 ft bgs, and the area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 800-1 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 865 on March 19, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-1, March 19.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #03-12, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Final Project Closeout Report for the Building 865 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2004c, Closeout Report for IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 881

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-2
Unit Name:	Laboratory and Office

This Final Update to the HRR for UBC 881 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 881 is summarized in this update. The following HRR volumes contain UBC 881 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1953 to 2001

Historical Summary

The location of UBC 881 is shown on Figure 24. Initially known as Plant B, Building 881 was one of the four original Plant manufacturing buildings in the early 1950s. Beginning in 1953, this structure housed the Plant's only enriched uranium component manufacturing and recovery operations. The original purpose of Building 881 was the processing and machining of enriched uranium (Oralloy) into finished weapons components. The Oralloy process consisted of chemical recovery and foundry operations, including continuous material dissolution, peroxide precipitation, calcination of uranium peroxide, leaching of powdered solids, graphite incineration, and Oralloy parts decontamination. Production of Oralloy components was phased out between 1964 and 1966. Limited enriched uranium recovery operations for site returns (weapons returned to the Plant for upgrade, reprocessing, or retirement) continued until the mid-1970s.

Stainless steel manufacturing (fabrication and testing) began in 1966 and continued until 1985. Stainless steel work consisted primarily of fabrication of the reservoirs, tubes, and fasteners associated with the trigger delivery system, and the sealing of beryllium ingots into stainless steel containers as part of the beryllium wrought process. Production operations included machining, cleaning, assembling, inspection and testing, and support. Conventional tools, such as lathes, mills, borers, and presses, were used in stainless steel machining operations. After machining, fabricated parts were cleaned using solvents, acids, and aqueous detergents. Equipment associated with the cleaning process included two vapor degreasers, and an ultrasonic cleaning unit. After machining and cleaning, the parts were inspected and tested. Inspection and testing operations included dimensional inspection (precise measurements), nondestructive testing, and destructive testing of representative samples. As part of nondestructive testing, parts were visually inspected for flaws and x-rayed to identify internal structural flaws.

A number of special projects ranging from ongoing R&D to one-time operations were conducted in Building 881 between 1953 and 1966. These projects included tracer components (processing of neptunium, curium, and cerium), uranium-233 processing, lithium fabrication, recovery of fuel rods, distillation, and cadmium plating of uranium parts.

Assembly operations were conducted in Building 881 and included matching, brazing, and welding. The parts were physically matched together, then assembled and joined by brazing or welding (tungsten-inert gas, electron-beam, or resistance). Welding machines were maintained in vacuum chambers. Other assembly operations consisted of clinching pressure fittings, tube bending, wire winding, solid film applications, fixture assembly, vacuum bakeout, resin molding, and adhesive assembly.

After stainless steel manufacturing was moved out of Building 881, the building became a multipurpose facility for R&D, computer support, analytical support, and administrative functions. Building 881 housed the Plant's central computing facilities and general chemistry laboratory. The laboratory provided general analytical and standards calibration, as well as development operations including waste technology development and testing of mechanical systems for weapons systems. After the Plant's mission changed to environmental remediation in 1989, a reduced amount of R&D continued in Building 881.

The building was demolished during 2004 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the Decommissioning Closeout Report for the 881 Closure Project (DOE 2004). OPWL P-7 was completely removed from beneath Building 881, and OPWL P-54 was removed except for a short section, which was plugged with epoxy at both ends. Two OPWL manways associated with Building 881 were completely removed (DOE 2005). After the Building 881 walls and floors were decontaminated, they were imploded onto the building slab and foundation. The debris was then buried with backfill, and the area was graded to achieve final grade.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 881 was characterized as part of IHSS Group 800-2 (July 16, 2002 to September 5, 2002) in accordance with IASAP Addendum #IA-02-04 (DOE 2002). Subsurface soil samples were collected from 77 sampling locations (68 under the building slab and 9 adjacent to the slab) (DOE 2003b). COCs included radionuclides, metals, VOCs, SVOCs, and PCBs. Analytical results indicated contaminant activities and concentrations were less than the proposed and final RFCA WRW soil ALs (DOE et al. 2002, 2003), with two exceptions.

- The lead concentration at location CF34-018 (0 – 0.5 ft below the Building 881 slab) was 1,150 mg/kg, and the WRW soil AL is 1,000 mg/kg.
- The benzo(a)pyrene concentration at location CF35-035 (0 – 0.5 ft below the Building 881 slab) was 15,000 µg/kg, and the WRW soil AL is 3,490 µg/kg.

These elevated soil concentrations were not removed because they occur below the Building 881 slab many feet below final grade.

In addition, a barium concentration (44,500 mg/kg) in surface soil near the UBC (sampling location CG34-016, PAC 800-1205) exceeded the WRW soil AL of 26,400 mg/kg. However, the soil at this location was not removed because the 95% UCL of the mean of the COC across the area of concern divided by the WRW soil AL was less than 1 (DOE 2003b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 881 based on the following:

- Subsurface soil analytical results were all less than RFCA WRW soil ALs, with three exceptions. (No surface soil samples were collected.)
- Results of the SSRS did not indicate additional action was necessary. Soil and residual contaminants beneath the building slab, located many feet below final grade, will not be susceptible to significant erosion and transport.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Data Summary Report for IHSS Group 800-2 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 881 on July 16, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 800-2, July 16.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-04, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, 2004, Decommissioning Closeout Report for the 881 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2005, Closeout Report for IHSS Group 000-2 Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2002, Proposed Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 883

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-3
Unit Name:	Roll and Form Building

This Final Update to the HRR for UBC 883 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 883 is summarized in this update. The following HRR volume contains UBC 883 information:

Original Report – 1992 (DOE 1992).

Date(s) of Operation or Occurrence

1957 to 1994

Historical Summary

The location of UBC 883 is shown on Figure 24. Building 883 was a nuclear facility constructed in 1956 to accommodate fabrication of enriched and depleted uranium parts used in weapons, specifically rolling and forming operations. Additions to Building 883 began in 1958 with the construction of storage and uranium component manufacturing spaces. In 1972, a valve room was added. From 1983 to 1985, additions were constructed to support the manufacturing of armor plates for M1A1 tanks. Starting in 1989, Building 883 operations began to diminish. In 1994, Building 883 operations ceased, and the building was closed. In 2005, Building 883 was demolished as a Type 2 facility in accordance with an approved Facility Disposition Notification and as documented in the Final Project Closeout Report for the Building 883 Cluster (DOE 2005a).

Enriched uranium was processed in Building 883, Side B, from 1957 to 1964. These operations were moved to the Oak Ridge Reservation between 1964 and 1966. After 1967, metalworking operations in the building primarily involved depleted uranium, in Side A, and binary metal (uranium-238 alloyed). Some stainless steel and aluminum work also occurred in the building on a routine basis. Beryllium, copper, and other metals and alloys were occasionally worked on in the building. Beryllium-forming operations took place in Side A from 1962 to the mid-1980s.

Operations included rolling, shearing, forging, pressing, roller leveling, grinding, punching, bending, welding, heating, annealing, and cleaning. Metal was annealed in salt baths or in furnaces with argon atmospheres. Vapor degreasing, grit blasting, water washing, and nitric acid etching were used during the cleaning process. Other processes conducted in Building 883 included inspection, nondestructive testing, weighing, shipping of fabricated parts, and receipt of raw materials used to fabricate, inspect, and clean the parts.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under

building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 883 was characterized as part of IHSS Group 800-3 (August 5, 2004 to April 19, 2005) in accordance with IASAP Addendum #IA-04-06 (DOE 2004). Surface and subsurface soil samples were collected from 38 sampling locations under the building slab (DOE 2005b). COCs included radionuclides, metals, VOCs, SVOCs, and PCBs. Several of the soil sampling locations specified in the IASAP Addendum could not be sampled because of the large amount of gravel (1-inch and smaller) located underneath much of Building 883. Much of the gravel extended down to bedrock. Instead, the sampling team inspected the area after the building slab was removed to identify areas with gravel staining and to sample soil at those locations. However, no staining was observed. Soil samples were collected as possible where exposed (for example, underneath waste lines, pits, and other deep features) or where there was evidence that the gravel layer was relatively thin. The gravel was also surveyed for radiological contamination. In addition, water in the building excavation and mud/sediment in the gravel were sampled.

Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE 2005b, DOE et al. 2003). The highest radionuclide activities above background are listed below.

- Americium-241 – 0.15 pCi/g
- Plutonium-239/240 – 0.18 pCi/g
- Uranium-234 – 10.3 pCi/g
- Uranium-235 – 0.75 pCi/g
- Uranium-238 – 7.5 pCi/g

Analytical results from the water sample indicated all activities and concentrations were less than RFCA Tier II groundwater ALs, with one exception. Uranium-238 was detected at 1.74 pCi/L, and the Tier II AL is 0.768 pCi/L (the Tier I AL is 76.8 pCi/L); however, uranium isotopic ratios in the downgradient well have a natural signature. Analytical results for the mud/sediment sample indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs. No elevated instrument readings were detected during radiological surveys of the remaining gravel.

In accordance with ER RSOP Notification #05-04 (DOE 2005c), the following RFCA accelerated action was conducted (DOE 2005b, DOE et al. 1996):

- The Building 883 slab and numerous equipment pads were removed. Building 883 OPWL Tanks T-25 and T-26 were removed prior to building D&D.
- Equipment pits were removed, including the Room 138 pit, the Room 139 pit, the steam line pit, the Cincinnati shear pit, and three transformer pits. Two 2,000-ton press pits were also removed. Four caissons under the eastern 2,000-ton press pit remain, but are deeper than 3 ft bgs.

- The Loewy rolling mill foundation was partially removed. The remaining foundation ranges from 14 to 20 ft bgs. The associated four roller table pits were also removed.
- The hydraulic elevator shaft was removed, but the casing around the cylinder remains. The casing is approximately 15 inches in diameter. The top of the casing is approximately 20 ft bgs, and the casing is approximately 12 to 13 ft in length.
- Foundation column pads attached to bedrock remain, but all columns were removed. The buttress beams on the southern and western sides of Building 883 were also removed.
- The air tunnels and air tunnel connections to the plenum building were removed; however, the tunnel between Building 883 and Building 881 remain. Both ends of the tunnel were sealed to disrupt the groundwater pathway. A cinder block wall was constructed at the inner door of each end. A small section of the building foundation was left in the southwestern corner of Building 883 to provide structural support to the tunnel. The top of the tunnel is 3 ft bgs.
- NPWL from Valve Vault 2 to Building 883 and from Valve Vault 2 to Valve Vault 1 were removed. NPWL from Valve Vault 2 to Valve Vault 3 was not removed, but RCRA clean-closed. Valve Vault 2 was removed to greater than 4 ft bgs and grouted. The remaining pipe stub in the valve vault wall was hand-packed with grout.
- All OPWL under Building 883 was removed as well as OPWL from approximately 4 ft east of Valve Vault 2 to Building 883. Remaining OPWL was grouted. OPWL from Valve Vault 2 north to the manway at Eighth Street and Central Avenue and the OPWL from Valve Vault 2 south to the manway were grouted at the manways.
- Sanitary lines under and adjacent to Building 883 were removed as well as the lift station south of the building.
- Storm and roof drains under and adjacent to Building 883 were removed. The storm drain southeast of Building 883 remains. The remaining drain is PVC piping.
- A clay pipe along the western side of Building 883, which was approximately 20 ft bgs, was removed. It is not clear from the as-built drawings or the excavation what this pipe was used for.
- At least the first foot of gravel under all removed structures, including the building slab, sumps, pits, and process waste lines, was removed.

All of the remaining structures are uncontaminated as indicated by in-process radiological surveys. After removal activities were completed, backfilling the Building 883 excavation commenced. The uncontaminated gravel that had been removed to allow structural features to be removed was mixed with clean soil and put back into the excavation. The source of clean soil is Functional Channel 1 (the Trailer T371 area).

NPWLs and valve vaults are addressed under PAC 000-504.

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 883 based on the following:

- Surface soil analytical results were all less than WRW soil ALs.

- Subsurface soil analytical results were all less than WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 800-3 (DOE 2005b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 883 on June 7, 2005 (CDPHE 2005).

Comments

None

References

CDPHE, 2005, Correspondence to J. Legare, DOE RFPO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-3, June 7.

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

DOE, 2004, Industrial Area Sampling and Analysis Plan Addendum #IA-04-06, IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2005a, Final Project Closeout Report for the Building 883 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2005b, Closeout Report for IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005c, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #05-04, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 886

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-4
Unit Name:	Critical Mass Laboratory

This Final Update to the HRR for UBC 886 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 886 is summarized in this update. The following HRR volumes contain UBC 886 information:

Original Report – 1992 (DOE 1992);
Update Report – 2001 Annual (DOE 2001a); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1965 to 1998

Historical Summary

The location of UBC 886 is shown on Figure 24. Building 886 was constructed to enable the Nuclear Safety Group to perform criticality experiments in one facility. The primary mission of the Critical Mass Laboratory was to perform criticality measurements on a variety of fissile material configurations in support of Plant activities. The criticality experiments and measurements were performed to establish criticality limits and ensure the safe handling and processing of fissile materials. A simplified sequence of events in performing a typical critical mass measurement involved removing the fissile material from storage, placing it in one of the Reactivity Addition Devices, operating the device remotely until criticality was achieved, measuring the slightly supercritical parameters, reversing the operation of the device to slightly subcritical and measuring these parameters, completing the reversal to well below subcritical, and returning the fissile material to storage. This effort supported the Plant's activities and assisted the Nuclear Regulatory Commission in setting industry safety standards. The measurements were essential to validate computer models that were, in turn, used to establish nuclear criticality safety limits now called Criticality Safety Operating Limits. The Nuclear Safety Group performed approximately 1,700 critical mass experiments using uranium and plutonium in solutions (900 tests), compacted powder (300), and metallic forms (500).

Building 886 was decommissioned during the late 1990s, and demolished during 2002 (DOE 2002a). Removal included the Building 886 slab, the Building 828 pit, and OPWL, and was conducted as a RFCA accelerated action (DOE et al. 1996) in accordance with ER RSOP Notification #02-03 (DOE 2002b) and the IM/IRA Plan for the 886 Cluster (DOE 1998). OPWL were drained and the ends grouted closed. Items remaining include portions of the ventilation tunnel that ran between Building 886 and Building 875 (walls and floor of tunnel >3 ft bgs), an electrical manway (>3 ft bgs), the grouted foundation drain (>3 ft bgs), and the grouted sanitary line running west from the midpoint on the west side of Building 886 to approximately the

midpoint between Buildings 886 and 865, then north to a manway in the driveway leading to Building 865 where it is disconnected and grouted (approximately 6 ft bgs).

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 886 was characterized during April 2001 (DOE 2001a, 2003b). Only a limited portion of the UBC was characterized at this time. The presence of a thick layer of gravel under the building prevented additional sampling. Thirteen surface soil samples were collected, and analyzed for radionuclides, metals, and VOCs. Results indicated all activities and concentrations were less than the proposed RFCA WRW soil ALs (DOE et al. 2002), which were subsequently approved and adopted (DOE et al. 2003).

UBC 886 was further characterized as part of IHSS Group 800-4 (March 13, 2002 to June 13, 2002) in accordance with IASAP Addendum #IA-02-03 (DOE 2001b). Surface and subsurface soil samples were collected from 24 sampling locations (DOE 2003b). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA WRW soil ALs (DOE et al. 2002).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 886 based on the following:

- Surface soil analytical results were all less than RFCA WRW soil ALs.
- Subsurface soil analytical results were all less than WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 800-4 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 886 on May 15, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-4, May 15.

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

DOE, 1998, Interim Measure/Interim Remedial Action Plan for the 886 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2001a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001b, Industrial Area Sampling and Analysis Plan Addendum #IA-02-03, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2002a, Final Project Closeout Report for the 886 Cluster Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #02-03, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

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

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2002, Proposed Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 887

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-5
Unit Name:	Process and Sanitary Waste Tanks

This Final Update to the HRR for UBC 887 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 887 is summarized in this update. The following HRR volumes contain UBC 887 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1953 to 2002

Historical Summary

The location of UBC 887 is shown on Figure 24. Building 887 housed process and sanitary waste holding tanks. In 1989, a worker discovered that the process waste tanks had overflowed onto the floor. Investigation of the release determined that the release was excess water from the acid scrubbers in Room 266. This incident resulted in the filing of a RCRA CPIR. The building and the attached pump station was demolished during 2004 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the Decommissioning Closeout Report for the 881 Closure Project (DOE 2004b). The building slab remains. All OPWL within the building and running between Buildings 881 and 887 were completely removed (DOE 2005).

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 887 was characterized as part of IHSS Group 800-5 (March 12, 2003 to April 12, 2004) in accordance with IASAP Addendum #IA-02-04 (DOE 2002). Subsurface soil samples were collected from five sampling locations (one under the building slab and four at the slab corners (DOE 2004c). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated all contaminant activities and concentrations were less than the RFCA ALs (DOE et al. 2003). The highest radionuclide activities above background are listed below.

- Uranium-235 – 0.22 pCi/g

- Uranium-238 – 2.56 pCi/g

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 887 based on the following:

- Subsurface soil analytical results were less than RFCA WRW soil ALs. (No surface soil samples were collected.)
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.

After review of the Data Summary Report for IHSS Group 800-5 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 887 on June 21, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Data Summary Report for IHSS Group 800-5, June 21.

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

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-04, IHSS Groups 800-2 and 800-5, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Decommissioning Closeout Report for the 881 Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2004c, Data Summary Report for IHSS Group 800-5, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2005, Closeout Report for IHSS Group 000-2 Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PAC REFERENCE NUMBER: UBC 889

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	800-6
Unit Name:	Decontamination and Waste Reduction

This Final Update to the HRR for UBC 889 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 889 is summarized in this update. The following HRR volumes contain UBC 889 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2003 Annual (DOE 2003a).

Date(s) of Operation or Occurrence

1966 to 2000

Historical Summary

The location of UBC 889 is shown on Figure 24. Building 889 was placed into service in 1966. Building 889 housed decontamination and waste reduction operations for wastes originating outside the PA. Wastes entering Building 889 included surplus equipment that would be decontaminated by steam cleaning for reuse on site or sale offsite. HEPA filters, combustible wastes, and non-reusable equipment were compacted, placed in crates, and shipped offsite for disposal.

Building 889 contained two concrete sumps within the concrete slab. The sumps were designated as Tank 28 and were connected to the OPWL, which ran to Tank 40, which was located west of UBC 889.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 889 was characterized as part of IHSS Group 800-6 (May 8, 2002 to October 16, 2002) in accordance with IASAP Addendum #IA-02-01 (DOE 2001). Surface and subsurface soil samples were collected from 11 sampling locations under the building slab (DOE 2003b). COCs included radionuclides, metals, VOCs, and SVOCs. Analytical results indicated all contaminant concentrations were less than the proposed RFCA WRW soil ALs (DOE et al. 2002), which were subsequently approved and adopted (DOE et al. 2003).

The Building 889 slab, Tank 28, waste lines, and other subsurface structural features, including footer walls, footers and sumps, were removed as a RFCA accelerated action (DOE et al. 1996) in accordance with ER RSOP Notification #02-02 (DOE 2002). P-10, a stainless steel OPWL line beneath Building 889 and extending from Building 889 to Valve Vault 4, was completely removed as part of the accelerated action. Four OPWL manways associated with Building 889 were also completely removed (DOE 2005). Activities were conducted between May and July 2002, and ended with site grading and vegetation (DOE 2003b).

No Further Action Recommendation

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 889 based on the following:

- Surface soil analytical results were all less than RFCA WRW soil ALs.
- Subsurface soil analytical results were all less than WRW soil ALs.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 800-6 (DOE 2003b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 889 on March 25, 2003 (CDPHE 2003).

Comments

None

References

CDPHE, 2003, Correspondence to R. DiSalvo, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 800-6, March 25.

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

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #02-02, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

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PAC REFERENCE NUMBER: UBC 991

IHSS Number:	Not Applicable
Current Operable Unit:	IA
Former Operable Unit:	Not Applicable
IHSS Group:	900-1
Unit Name:	Weapons Assembly and R&D

This Final Update to the HRR for UBC 991 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this UBC in accordance with the RFCA accelerated action process. The disposition of UBC 991 is summarized in this update and includes Buildings 991, 996, 997, 998 and 999, and the interconnecting tunnels (991 Tunnel, Tunnel 996, and Tunnel 998). Buildings 996, 997, 998, and 999 were Building 991 vaults. The following HRR volumes contain UBC 991 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1952 to 2003

Historical Summary

The location of UBC 991 is shown on Figure 24. Building 991, constructed between 1951 and 1952, was the first major building to be completed at RFETS. Building 991 was designed for shipping and receiving, and final assembly of weapon components. Plutonium, enriched uranium, and depleted uranium components fabricated on site, along with components manufactured from the Hanford Site and the Oak Ridge Reservation, were assembled into final products, inspected, tested, and placed back in storage prior to off-site shipment in Building 991. Radioactive and nonradioactive raw materials, special-order items, packaging items, components, and samples were stored in the Building 991 vaults. Administrative services for the Plant were also carried out in Building 991 until Building 111 was completed in 1953.

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

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

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

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

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

The building was demolished during 2004 as a Type 2 facility in accordance with an approved Facility Disposition RSOP Notification and as documented in the D&D Closeout Report (DOE 2005). The basement, vaults and most of the tunnels were left in place. The foam fire that occurred during building removal did not adversely impact soil at the UBC (DOE 2004b). After the building was demolished, the excavation was backfilled and the site was graded as necessary to minimize erosion and prevent any large-scale ponding of precipitation. The site was later graded to conform to the Site's land configuration plan.

Soil and/or groundwater beneath the building may have become contaminated because of activities conducted within the building. Indoor unplanned events and routine operations, such as chemical spills and releases from process equipment or waste lines, may have led to under building contamination. Building sumps, floors, and foundation walls may have cracked or been otherwise unsealed and have created a pathway for contamination of the environment beneath the building.

UBC Investigation

UBC 991 was characterized as part of IHSS Group 900-1 (February 4, 2003 to January 19, 2004) in accordance with IASAP Addendum #IA-03-03 (DOE 2003). Surface and subsurface soil samples were collected from 24 sampling locations (19 under the building slab and 4 adjacent to the slab (DOE 2004b). COCs included radionuclides, metals, and VOCs. Analytical results indicated contaminant concentrations were less than the RFCA ALs (DOE et al. 2003), with three exceptions. One surface sample and two subsurface samples had arsenic concentrations greater than the AL. The surface concentration was 25.2 mg/kg, the subsurface concentrations were 25.1 and 40.0 mg/kg, and the AL is 22.2 mg/kg. The highest radionuclide activities above background are listed below.

- Uranium-234 – 6.1 pCi/g
- Uranium-235 – 0.34 pCi/g
- Uranium-238 – 6.1 pCi/g

Based on the accelerated action characterization results and the SSRS evaluation, no accelerated removal action was necessary (DOE 2004b). The area is not susceptible to high erosion.

No Further Action Recommendation

Accelerated action data indicated contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE et al. 2003), with three exceptions. As indicated above, one surface sample and two subsurface samples had arsenic concentrations greater than the AL. However, results of the SSRS indicated additional action was not necessary. Results of the stewardship evaluation also indicated additional action was not necessary. Additionally, no long-term stewardship activities were recommended for the UBC beyond the generally applicable Site requirements that may be imposed on this area in the future.

In accordance with RFCA (DOE et al. 1996), an NFAA was justified for UBC 991 based on the following:

- Surface soil analytical results were less than RFCA WRW ALs with one arsenic exception. The elevated arsenic concentration in surface soil was 25.2 mg/kg, and the AL is 22.2 mg/kg. The 95 percent UCL of the mean arsenic concentration across the area of concern divided by soil AL was less than one.
- Subsurface soil analytical results were less than WRW ALs with two arsenic exceptions. Concentrations were 25.1 and 40 mg/kg, and the 40 mg/kg concentration was detected at a depth of over 20 ft bgs, beneath the Building 998 vault.
- Results of the SSRS did not indicate additional action was necessary. The area is not susceptible to high erosion.
- Results of the stewardship evaluation did not indicate additional action was necessary.

After review of the Closeout Report for IHSS Group 900-1 (DOE 2004b) by the regulatory agencies, DOE received approval from CDPHE (the LRA) of the NFAA status for UBC 991 on March 31, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. H. Gunderson, CDPHE, RE: Closeout Report for IHSS Group 900-1, March 31.

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DOE, 2005, Final Project Closeout Report for the 991 Cluster Closure Project, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

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DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

OFF-SITE AREA

Figure 25
HRR Operable Unit 3

PAC REFERENCE NUMBER: OFF-SITE AREAS 1, 2, 3, and 4

IHSS Number:	199 (Contamination of the Land's Surface) 200 (Great Western Reservoir) 201 (Standley Lake) 202 (Mower Reservoir)
Current Operable Unit:	Not Applicable
Former Operable Unit:	3
IHSS Group:	Not Applicable
Unit Name:	Off-Site Areas

The Final Update to the HRR for IHSSs 199, 200, 201, and 202 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of these IHSSs in accordance with the RFCA accelerated action process. The disposition of the Off-Site Areas is summarized in this update. The following HRR volumes contain Off-Site Area information:

Original Report – 1992 (DOE 1992); and
Update Report – 1997 Annual (DOE 1997a).

Date(s) of Operation or Occurrence

1952 to 1997

Historical Summary

RFETS OU 3, Off-Site Areas, consists of four contaminated off-site areas where contamination is associated with Rocky Flats operations: IHSS 199 (Contamination of the Land's Surface), IHSS 200 (Great Western Reservoir), IHSS 201 (Standley Lake), and IHSS 202 (Mower Reservoir) as shown on Figure 25. These four IHSSs are all located downwind and downgradient of RFETS in relatively close proximity to the Site's eastern boundary. For purposes of simplifying the HRR, these off-site IHSSs have been aggregated into this single write up under PAC Reference Number Off-Site Areas 1, 2, 3, and 4. However, they are discussed separately below because they have been separately investigated and characterized in previous studies (DOE 1992, 1997a).

The studies concluded that some hazardous substances from historical RFETS activities were transported to the Off-Site Areas through surface water and air pathways; however, in-depth analyses of the study results led to a "no action" remedy identification for OU 3.

IHSS Investigations

The following sections summarize the historical release information and site conditions as presented in the original HRR (DOE 1992) and supplemented by information presented in the OU 3 RFI/RI Report (DOE 1996a) and the OU 3 CAD/ROD (DOE 1997b).

OU 3 RFI/RI

IHSSs 199, 200, 201, and 202 were investigated in accordance with the Final RFI/RI Work Plan for OU 3 (DOE 1991). The OU 3 RFI/RI concluded that only surface soil and surface sediment

media contained COCs for which a remedy should be evaluated. The following number of samples and media were collected to support the OU 3 RFI/RI field investigations and COC determination:

- 334 soil samples (radionuclides);
- 76 surface water samples (radionuclides and metals);
- 345 sediment samples (radionuclides, VOCs, and metals); and
- 8 groundwater samples (radionuclides and metals).

Based on data usability assessments, statistical evaluations, and weight-of-evidence evaluations, only two radionuclides (plutonium-239/240 and americium-241) were determined to be COCs in surface soil and surface sediment. To address the ecology, qualitative and quantitative sampling was performed to characterize, determine biotic components, and measure bioaccumulation of COCs. Terrestrial and aquatic ecosystem sampling and analyses indicated minimal risk to either the terrestrial or aquatic ecology as a result of the presence of the COCs within the soil and sediment.

The HHRA portion of the OU 3 RFI/RI evaluated both residential and residential-based exposure scenarios for COCs and source areas for IHSSs 199 and 200. The HHRA identified dermal contact, inhalation, ingestion, and external radiation as the potential exposure routes (DOE 1996a).

Corrective Action Decision/Record of Decision

Following public review and comment of the Proposed Plan, the CAD/ROD was finalized on June 3, 1997. The CAD/ROD selected a No Action remedy for OU 3 (DOE 1997b).

IHSS 199 – Contamination of the Land's Surface

IHSS 199, Contamination of the Land's Surface, was delineated by the nature and extent of off-site surface contamination described in the RFI/RI. The IHSS 199 COCs were identified as plutonium-239/240 and americium-241, in surface soil. A combination of surface and subsurface soil samples were collected for the RFI/RI. The surface soil samples consisted of 61 10-acre square plots, spaced approximately 1,000 meters apart. The subsurface soil investigations consisted of sampling undisturbed soil from a vertical profile to a depth of approximately 100 cm. Eleven trenches east of Indiana Street were sampled. Air sampling was also part of the IHSS 199 field investigation. The OU 3 air program had two components: a wind-tunnel study and an air sampling program. Data were collected from both to characterize the health impacts from dispersion of potentially radioactive sediment and soil (DOE 1996a).

As summarized in the CAD/ROD, the highest calculated excess cancer risk from radionuclides for IHSS 199 was 3×10^{-6}. This risk estimate assumed a reasonable maximum exposure to a hypothetical resident (DOE 1997b). Historical data, as well as data collected to support RFI/RI conclusions were used to assess the risk posed by the IHSS. Based on documents on airborne plutonium releases from RFETS, the following were considered to be the most probable sources of IHSS 199 contamination: (1) a September 11, 1957, fire in Building 771; (2) a May 11, 1969 fire in Building 776; (3) leaking drums of plutonium-contaminated lathe coolant at the 903 Pad (PAC 900-112); and (4) low-level contamination contained in building filtered exhaust system stack effluent. Other possible sources included on-site burning of flammable wastes for disposal purposes, including waste oils contaminated with trace amounts of uranium (PAC 300-128,

PAC 900-153, and PAC 300-171). Less plausible potential sources include a fire in Building 444 that breached the building exhaust filters, possibly releasing airborne beryllium to the environment (PAC 400-157.2), and entrainment by high velocity winds of waste water from the SEP (PAC 000-101). SEP waste water contained nitrates and trace amounts of radionuclides, primarily uranium isotopes and nonradioactive metals. Studies concluded that the great majority of the plutonium at IHSS 199 originated as windborne particulates from the 903 Pad, rather than the 1957 and 1969 fires, and chronic stack emissions, or other sources (DOE 1997b).

Also included within IHSS 199 are lands adjoining the eastern and southern RFETS boundaries (the "lawsuit acreage"), which were the subject of a 1975 lawsuit filed by the land owners against the Site contractors at the time, alleging contamination of the land's surface by historical RFETS releases. Several technical investigations and studies of the lawsuit acreage were conducted by the various parties to the lawsuit to provide supporting evidence in the case. Under a July 1985 settlement agreement, remedial action was to be implemented on those portions of the land containing plutonium-239/240 in surface soil in concentrations exceeding the CDPHE construction standard of 0.9 pCi/g. Two contiguous tracts of land immediately east of RFETS totaling 350 acres (the "remedy acreage"), then owned by the City of Broomfield and Jefferson County, were targeted for remediation. Remediation design primarily consisted of tilling to reduce surface concentrations and revegetating to stabilize the soil (DOE 1992, 1996a). According to the Final RFI/RI (approved June 1996), at the time of its writing, approximately 120 acres of the Jefferson County land had been remediated and the City of Broomfield did not request that RFETS remediate their portion of the remedy acreage. The Jefferson County land, approximately 250 acres, was acquired by the City of Westminster in February 1995 (DOE 1996a).

IHSS 200 – Great Western Reservoir

IHSS 200 encompasses Great Western Reservoir, off-site reaches of Walnut Creek (which formerly flowed into the reservoir from RFETS), and downstream surface water features possibly impacted by outflow from the reservoir.

Great Western Reservoir is located less than 1 kilometer from the RFETS eastern boundary. The reservoir is owned by the City of Broomfield and is used solely for irrigation. Great Western Reservoir receives most of its water through the McKay Ditch Bypass from Coal Creek. Coal Creek is west of RFETS and is not believed to be impacted by Rocky Flats activities. In the past, Great Western Reservoir also received influent from Walnut Creek, which flows from RFETS. A chromic acid release at RFETS in 1989 (DOE 1992) prompted construction of a Walnut Creek diversion around Great Western Reservoir, known as the Broomfield Diversion Ditch, which now prevents surface water flowing from RFETS from reaching Great Western Reservoir (DOE 1992).

During the operating history of RFETS, various waste streams were discharged through the on-site A-Series (A-1, A-2, A-3 and A-4) (PACs NE-142.1, NE-142.2, NE-142.3, and NE 142.4) and B-Series (B-1, B-2, B-3, B-4, and B-5) (PACs NE-142.5, NE-142.6, NE-142.7, NE-142.8, and NE-142-9) Ponds to Walnut Creek. Since September 1974, Rocky Flats has participated in and complied with the NPDES permitting process. The effluents contained metals, radionuclides, and inorganic ions (especially nitrate) within concentration limits considered acceptable at the time. Contaminants from these discharges accumulated in varying amounts in the sediments of the on-site ponds, Walnut Creek, and Great Western Reservoir. Radioactive materials released

from RFETS may also have been transported to Great Western Reservoir as airborne particulates (fugitive dust) (DOE 1992). Sediment removal from Ponds B-1, B-2, and B-3 was completed in March 2005 (DOE 2005).

Available data from on-site RFETS OUs, particularly OU 6 (Walnut Creek Drainage), provide an indication of contaminants other than plutonium that could conceivably have impacted Great Western Reservoir through surface water transport from Rocky Flats. Leaks from the SEP (PAC 000-101) are known to have contaminated groundwater and surface water in the Walnut Creek Drainage, primarily with nitrate and other inorganic ions. Inorganic ions, nonradioactive metals, VOCs, and uranium were detected in the Walnut Creek B-Series Ponds. Herbicides applied in the past at various locations on Rocky Flats have also been detected in RFETS surface water. Other potential RFETS-derived contaminants in IHSS 200 other than plutonium-239/240 and americium-241 have not been extensively studied; however, a 1973 EPA study measured concentrations of beryllium and select radionuclides other than plutonium-239/240 in Great Western Reservoir sediments. No significant variations in the concentrations of these potential Rocky Flats contaminants were observed throughout the reservoir or between Great Western Reservoir and Standley Lake (IHSS 201).

An accidental release of tritium from Rocky Flats into Walnut Creek and Great Western Reservoir occurred in 1973. Tritium concentrations in Great Western Reservoir water returned to approximately background levels by 1977. Tritium was one of the radionuclides routinely monitored in RFETS surface water effluents up until FY2004, at which point the history of tritium nondetections resulted in the decision documented in the IMP to cease monitoring for this analyte (DOE 2004). Tritium contamination in reservoir sediments has not been studied; however, tritium is not expected to concentrate in sediments because of its high mobility in the environment (DOE 1992).

Numerous sampling programs were conducted at Great Western Reservoir, focusing primarily on plutonium-239/240 and americium-241 contamination in reservoir bottom sediments. The results have shown that a discrete layer of sediment containing plutonium-239/240 greater than the EPA estimated baseline (worldwide atmospheric fallout) level of less than or equal to 0.1 pCi/g is present throughout the bottom of the reservoir. Samples collected from Colorado Front Range reservoirs believed to be unaffected by RFETS activities have corroborated this estimated baseline concentration. The highest concentrations of plutonium-239/240 were detected in the deepest areas of the reservoir. The plutonium-239/240-bearing sediment layer corresponds with historical RFETS releases, and was buried to varying depths by subsequent sedimentation. Sedimentation rates based on core samples vary from greater than 3.5 cm/yr in the eastern, deeper areas of the reservoir to less than 0.25 cm/yr in the shallowest areas (DOE 1992).

Characterization samples at IHSS 200 were collected during the OU 3 RFI/RI. The RFI/RI Report substantiated the findings from previous investigations concluding that waterborne transport from RFETS was the most likely means of plutonium-239/240 deposition to Great Western Reservoir sediments. Comparing data gathered during the RFI/RI in 1992 to data gathered in 1983 and 1984, in general, plutonium-239/240 concentrations in sediments decreased from 30 to 10 percent in similar locations. The two data sets exhibit very similar vertical plutonium-239/240 profiles, however, indicating vertical migration of plutonium-239/240 in reservoir sediments is not occurring (DOE 1997b). This conclusion is consistent with previous studies of plutonium-239/240 behavior in RFETS surface water environs that demonstrated the clay fraction of typical RFETS-area sediments has an extremely high affinity for

plutonium 239/240. Related laboratory studies have shown that the adsorption of plutonium 239/240 onto these sediments is rapid and essentially irreversible. The studies demonstrated that plutonium-239/240 in surface water impoundments (for example, reservoirs) is not readily transported from the impoundments. It has been previously concluded that no evidence of plutonium-239/240 migration through the sediment column exists at Great Western Reservoir (DOE 1992).

Since the Plant's inception, RFETS has monitored Walnut Creek water quality immediately inside the RFETS boundary. IHSS 200 surface water quality is also extensively monitored by the City of Broomfield and CDPHE. Water samples from Great Western Reservoir and off-site reaches of Walnut Creek were routinely analyzed for gross alpha and beta radiation, select radionuclides, VOCs, pesticides, herbicides, metals, and base neutral acids (DOE 1992).

The nature and extent of contamination associated with IHSS 200 was delineated in the OU 3 RFI/RI (DOE 1996a). IHSS 200 COCs consisted of radionuclides in surface sediment. Historical data, as well as data collected to support RFI/RI conclusions, were used to assess the risk posed by the IHSS. As summarized in the CAD/ROD, the highest calculated excess cancer risk for IHSS 200 was 9×10^{-7}. This risk estimate assumed a reasonable maximum exposure to a hypothetical resident (DOE 1997b).

IHSS 201 – Standley Lake

IHSS 201 encompasses Standley Lake, off-site reaches of Woman Creek (which previously flowed into the reservoir from RFETS), and downstream surface water features possibly impacted by outflow from the reservoir.

Standley Lake is a large reservoir located approximately 3 kilometers southeast of the RFETS eastern boundary. Uses of the reservoir include municipal water supply and recreation. Approximately 67 percent of the water is used as water supply for the cities of Westminster, Northglenn, and Thornton. The remaining 33 percent is transported through irrigation ditches to agricultural areas northeast of the reservoir, primarily between Broomfield and Fort Lupton. Standley Lake receives approximately 96 percent of its water from Coal Creek through an irrigation ditch, but has also been fed by Woman Creek, which drains the southern side of RFETS (DOE 1992). Woman Creek flows into Woman Creek Reservoir, which was constructed in 1996 as a major component of the Option B water management project. The 400 acre-foot reservoir was constructed to capture Woman Creek surface water from RFETS before it flows into Standley Lake (DOE 1996b).

During the operating history of RFETS, various waste streams were discharged to the Woman Creek drainage (PAC SE-142.10 and PAC SE-142.11 [C-Ponds]). Since September 1974, RFETS participated and complied with the NPDES permitting process. The effluents contained metals, radionuclides, and inorganic ions within concentration limits considered acceptable at the time. Contaminants from these discharges accumulated in varying amounts in the sediments of the on-site holding ponds, Woman Creek, and Standley Lake. Radioactive materials released from RFETS may also have been transported to Standley Lake as airborne particulates (fugitive dust) (DOE 1992).

Prospective RFETS sources of contaminants other than plutonium-239/240 to Standley Lake, particularly VOCs and uranium, existed at OU 1 (881 Hillside) and OU 2 (903 Pad, Mound, and

East Trenches). Herbicides, which have been applied in the past at various locations within RFETS, have also been detected in RFETS surface water (DOE 1992).

Sampling programs at Standley Lake have focused primarily on plutonium-239/240 and americium-241 contamination in reservoir bottom sediments. The results suggest that a discrete layer of sediment containing plutonium-239/240 greater than the EPA estimated baseline (worldwide atmospheric fallout) level of less than or equal to 0.1 pCi/g is present in some areas of the reservoir. As in Great Western Reservoir, the highest plutonium-239/240 concentrations appear to exist in the deepest areas of Standley Lake. The plutonium-239/240-bearing sediment corresponds with historical RFETS releases, which appear to have peaked in 1969. The affected sediments were buried to varying depths by subsequent sedimentation. Sedimentation rates based on a core sample from the deeper area of the reservoir are estimated to be 3.4 cm/yr (DOE 1992). As summarized in the OU 3 RFI/RI, the maximum plutonium-239/240 value in Standley Lake surficial sediments peaked at 0.55 pCi/g and averaged 0.03 pCi/g. The subsurface sediment maximum was 0.38 pCi/g. Additional sampling of IHSS 201 surface water was also conducted during the OU 3 RFI/RI, and concentrations were observed to be either below background or not detected (DOE 1996a, 1997b).

Historical data, as well as data collected to support RFI/RI conclusions, were used to identify COCs associated with IHSS 201. None were identified and risk estimates were not deemed necessary for IHSS 201 (DOE 1996a).

IHSS 202 – Mower Reservoir

IHSS 202 encompasses Mower Reservoir, off-site reaches of the irrigation ditch which feeds the reservoir from Woman Creek, and downstream surface water features possibly impacted by outflow from the reservoir (DOE 1992).

Little documentation exists for Mower Reservoir. Mower Reservoir is a small, privately-owned impoundment located just southeast of RFETS. The reservoir was historically fed by Woman Creek through Mower Ditch, an irrigation ditch located in the RFETS BZ. However, the flow from Woman Creek into Mower Ditch has been completely shutoff since September 1997. Mower Reservoir is used for agricultural purposes, primarily cattle watering and irrigation. It covers an area of approximately 9 acres. Intermittent discharge from Mower Reservoir flows southeast from the reservoir, eventually discharging to Standley Lake (IHSS 201) (DOE 1992).

In contrast to the extensive historical sampling data available for IHSSs 200 and 201, only very limited data have been collected to characterize Mower Reservoir. Mower Reservoir sediment samples collected in 1970 slightly exceeded EPA's expected plutonium-239/240 baseline concentration of less than or equal to 0.1 pCi/g. Because the reservoir is not a public water supply, water quality is not monitored and has not previously been evaluated (DOE 1992). Additional sampling, conducted during the OU 3 RFI/RI, of surficial sediments in the reservoir indicated a maximum plutonium-239/240 activity of 0.49 pCi/g with an average of 0.291 pCi/g. The subsurface sediment concentration maximum was 1.11 pCi/g (DOE 1996a, 1997b).

RFETS-derived contaminants in Mower Reservoir are believed to have been transported primarily as airborne particulates and, to a lesser degree, by surface water through Woman Creek. Numerous investigations of IHSS 199 (Contamination of the Land's Surface) have shown elevated plutonium-239/240 concentrations in surface soil around Mower Reservoir. It is expected that Mower Reservoir received similar amounts of plutonium-239/240 through airborne

transport of dust from the nearby land surface (DOE 1992). These conclusions were affirmed by the OU 3 RFI/RI (DOE 1996a).

Historical data, as well as data collected to support RFI/RI conclusions, were used to identify COCs associated with IHSS 202. None were identified and risk estimates were not deemed necessary for IHSS 202 (DOE 1996a).

No Further Action Recommendation

A No Action CAD/ROD for OU 3 (that is, IHSSs 199, 200, 201 and 202) was approved by EPA (the LRA) and CDPHE. A CERCLA, Section 121(c), 5-year review was also completed from October 2001 through May 2002 with participation of EPA and CDPHE Staff. The No Action decision for OU 3 was determined to be adequately protective (DOE 1997b) (AR Reference number SW-A-004535).

Comments

CERCLA Five Year Review

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at a Site shall be periodically reviewed no less than every 5 years (Five-Year Review) to assure adequate protection of human health and the environment. Comprehensive Five-Year Review Guidance was also issued by EPA in June 2000 and provided such reviews are to be conducted on a Site-wide basis for response actions that did not result in levels of contamination that allow unrestricted and unlimited use. The CAD/ROD for OU 3, signed in May 1997, although a no action decision, stipulated that a Section 121 (c) review would be required for that OU because the completion of the then ongoing review of interim soil ALs for radionuclides was not complete at that time. This date was considered the trigger for this first periodic Site review.

DOE conducted the review from October 2001 through May 2002, with participation of EPA and CDPHE Staff. The Final Report (DOE 2002), which includes a Protectiveness Statement, as required by EPA guidance, was concurred with by EPA on September 26, 2002.

Pursuant to the Protectiveness Statement, DOE's ongoing custody and control of RFETS, ongoing monitoring programs and restriction of public access serve to adequately control risks posed by contamination at RFETS. The no action decision for OU 3, which lies to the east of the RFETS property boundary and outside DOE custody and control, was determined to be adequately protective. In addition, it was recognized that DOE was continuing cleanup under RFCA and proceeding towards a final remedy that is expected to be adequately protective when implemented.

It was also concluded that final remedy for OU 1 is protective and that the accelerated actions addressed the immediate hazards presented prior to the actions and for the most part are functioning as intended. The potential bypassing of the Solar Pond Plume Reactive Barrier by contaminated ground water was identified an area where the system may not be properly functioning, but this did not result in contaminated ground water impacting surface water that left the Site above water quality standards.

Recommendations to address issues and deficiencies noted were also made.

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PICs

Figure 26
PIC Locations

PIC REFERENCE NUMBER: 1

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Hydraulic Oil Leak – Portal 2

The Final Update to the HRR for PIC 1 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 1 is summarized in this update. The following HRR volumes contain PIC 1 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

November and December 1988

Historical Summary

The approximate location of this PIC is shown on Figure 26. During the week ending November 5, 1988, a hydraulic system pressure gauge on the Portal 2 gate failed, spraying oil onto the equipment cabinet and leaking oil onto the ground. On December 7, 1988, a spill of less than 5 gallons of hydraulic fluid from the Portal 2 gate mechanism was reported to Environmental Management (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 1 was identified detailing the fate of the constituents released or the location.

The material safety data sheet (MSDS) for hydraulic oil indicates low toxicity effects from inhalation, eye contact, skin contact and ingestion (Millipore 2005). Hydraulic oil is not considered a listed hazardous waste (40 CFR, Part 261D) by EPA and used hydraulic oil is handled on a case-by-case basis. Further, hydraulic oil does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity and does not have TCLP characteristics (Millipore 2005).

PIC Investigations

No other PIC 1-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 1 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was believed to have been cleaned up and very likely to asphalt given the nature of Portal 2. It is not likely that this spill adversely impacted soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Millipore, 2005, Millipore Environment, Health and Safety, MSDS; Hydraulic Oil.

PIC REFERENCE NUMBER: 2

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Gasoline Spill South of Building 707

The Final Update to the HRR for PIC 2 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 2 is summarized in this update. The following HRR volumes contain PIC 2 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 26, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. A can of gasoline fell from a truck and spilled approximately 1 gallon onto the ground beside a road. The soil was removed and placed into a drum as a response to this occurrence (DOE 1992). The benzene content of unleaded gasoline typically ranges from 0.4 to 4.91 percent, thus this material was handled as a RCRA-regulated hazardous waste. No additional documentation was found that further details responses to this occurrence.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 2 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 2-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 2 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on discussions at that meeting, it was agreed that an NFA was justified for PIC 2 because the spill was cleaned up; and it did not further impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 3

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Battery Acid Spill – Building 750

The Final Update to the HRR for PIC 3 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 3 is summarized in this update. The following HRR volumes contain PIC 3 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 10, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. A battery was dropped outside the entrance to Building 750. Liquid spilled from the battery onto the concrete walkway. Sodium bicarbonate was used to neutralize the acid and the residue was disposed of in the Present Landfill (PAC NW-114) (DOE 1992).

The event was designated as a PIC, during the HRR investigation in 1992, because the reference was not clear regarding the specific entrance to Building 750. No additional documentation was identified for PIC 3 detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 3-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 3 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on discussions at the meeting, it was agreed that an NFA was justified for PIC 3 because the spill was cleaned up and was to either an asphalt or concrete surface. This spill did not likely adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 4

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Process Cooling Water Spill – Buildings 776/777

The Final Update to the HRR for PIC 4 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 4 is summarized in this update. The following HRR volumes contain PIC 4 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

February 6, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. On February 6, 1989, an alarm indicated a high liquid level in an unused production pit outside Buildings 776 and 777. A pipe froze and broke, spilling 1,200 gallons of process cooling water into the pit. The exact location of the pipe break could not be determined from documentation reviewed. Process cooling water with an activity of 51 pCi/L of an unknown material was released into the pit; however, the pit is believed to have prevented a release to the environment. In response, the supply and return valves to the production pit were closed, thereby isolating the pit from the system. The water in the production pit was analyzed and a determination was made to pump the liquid to the process waste drains. No additional documentation was found that further details response to this occurrence (DOE 1992).

PIC Investigations

When the original HRR was prepared, the exact location of this occurrence could not be determined from documentation reviewed. However, two SOEs from Buildings 776/777, who were in the building at the time of the release, recently reported (2004) that the process cooling water spilled into the Building 781 Pit (DOE 2004b). B781 is a small, below-grade concrete building/pit located just southeast of Building 777 that contained a helium compressor system for Building 777. It was out of service in 1989 according to the SOEs. There was a liquid level alarm in Building 781 that sounded in Building 777. The SOEs stated that the water filled the pit but did not release to the environment, and the water was pumped out of the pit into a process waste drain in Building 777 (DOE 2004b).

The concentration of radionuclides in the process cooling water released into the pit was very low relative to the WRW ALs. The water had a radionuclide concentration of 51 pCi/L, or 0.051 picocuries per milliliter (pCi/mL) (0.051 pCi/g) (DOE 2004b).

In accordance with the IASAP Addendum #IA-03-04 (DOE 2003), several samples were collected in the vicinity of PIC 4. Analytical results for these samples were less than RFCA WRW soil ALs.

No Further Action Recommendation

This spill was into a pit; and it did not impact soil or water. It was agreed in an NFA Working Group meeting on April 3, 2002, that additional research/investigation, sampling and analysis, where appropriate, would be performed for PIC 4 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the No Action warranted status for PIC 4 on April 30, 2004 (CDPHE 2004). The primary reason for NFA approval of PIC 4 was based upon the very low radiological activity (0.051 pCi/mL).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

PIC REFERENCE NUMBER: 5

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Coolant Spill – Building 729

The Final Update to the HRR for PIC 5 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 5 is summarized in this update. The following HRR volumes contain PIC 5 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

November 13, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. Due to a faulty thermostat, the cooling system in Building 729 failed during routine testing of the emergency generator. Five gallons of coolant flowed out of the radiator and onto the ground outside the building. The coolant consisted of 50 percent ethylene glycol in water. The generator was shut down and the faulty thermostat was replaced (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 5 was identified detailing the fate of the constituents released or the location.

Using the Integrated Risk Information System (IRIS) reference dose of 2 milligrams per kilogram per day (mg/kg/day) and a hazard quotient (HQ) of 1.0, the calculated WRW soil AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS further states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

PIC Investigations

No other PIC 5-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 5 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was believed to have been cleaned up and not a reportable quantity. It

is not likely that this spill adversely impacted soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 6

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Fuel Oil Spill – Building 707

The Final Update to the HRR for PIC 6 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 6 is summarized in this update. The following HRR volumes contain PIC 6 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

April 6, 1987

Historical Summary

The approximate location of this PIC is shown on Figure 26. A construction contractor was drilling a fence post-hole when he struck a fuel oil line. The line ruptured and spilled approximately 28 gallons of diesel fuel. CDH and the Colorado Oil Inspector were notified of the spill (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

Additional research was completed regarding PIC 6 for the Annual Update to the HRR for 2004 (DOE 2004a). Pictures associated with the spill reveal that the spill actually took place on the northern side of Building 776 and was not associated with Building 707 (DOE 2004a). The photos of the spill indicate the diesel flowed a short distance north and then west. The entire area was paved in the vicinity of the spill as a radiation control measure in response to the Building 776 fire. It is unlikely that a release of 28 gallons of oil migrated to an unpaved area (DOE 2004a).

PIC Investigations

No other PIC 6-specific investigation was deemed necessary.

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002, that additional research/investigation and sampling and analysis, where appropriate, would be performed for PIC 6 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report

(DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the No Action warranted status for PIC 6 on April 30, 2004 (CDPHE 2004).

An NFA was justified for PIC 6 because the spill was onto asphalt; and it did not adversely impact soil or water. Further, it was agreed that the spill was likely cleaned up for practical/safety purposes because the area is heavily used by Plant personnel.

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

PIC REFERENCE NUMBER: 7

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Hydraulic Oil Spill – Building 707

The Final Update to the HRR for PIC 7 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 7 is summarized in this update. The following HRR volumes contain PIC 7 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

December 7, 1990

Historical Summary

The approximate location of this PIC is shown on Figure 26. Approximately 2.5 gallons of hydraulic oil were released from a broken line on a forklift and spilled onto the asphalt outside Building 707. The hydraulic oil was cleaned up and disposed of per procedures (DOE 1992). No documentation was found that further detailed response to this occurrence.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 7 was identified detailing the fate of the constituents released or the location.

The MSDS for hydraulic oil indicates low toxicity effects from inhalation, eye contact, skin contact and ingestion (Millipore 2005). Hydraulic oil is not considered a listed hazardous waste (40 CFR, Part 261D) by EPA and used hydraulic oil is handled on a case by case basis. Further, hydraulic oil does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and does not have TCLP characteristics (Millipore 2005).

PIC Investigations

No other PIC 7-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 7 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up. It is very unlikely that this spill adversely impacted soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Millipore, 2005, Millipore Environment, Health and Safety, MSDS; Hydraulic Oil.

PIC REFERENCE NUMBER: 8

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Diesel Oil Spill North of Building 559

The Final Update to the HRR for PIC 8 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 8 is summarized in this update. The following HRR volumes contain PIC 8 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 2, 1985

Historical Summary

The approximate location of this PIC is shown on Figure 26. A portable air compressor was tipped off of its leveling blocks spilling approximately 1 gallon of No. 2 diesel fuel onto the roadway north of Building 559. A truck driver spread sand on the spill and the sand was to be cleaned up the following day (DOE 1992). No further information could be found detailing the response to this incident.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 8 has been identified, detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 8-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 8 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was believed to have been cleaned up and was to a roadway (not directly to soil). It is very unlikely that this spill adversely impacted soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 9

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: 500-2

Unit Name: Building 551 Chemical Leaks

The Final Update to the HRR for PIC 9 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 9 is summarized in this update. The following HRR volumes contain PIC 9 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

April 1, 1965, and May 1974

Historical Summary

The approximate location of this PIC is shown on Figure 26. On April 1, 1965, an unspecified amount of aqueous ammonia leaked from drums onto the ground at Building 551. The drums were inside a railroad car at the time they were observed leaking. A leaking drum of carbon tetrachloride was found outside Building 551 during an inspection in May 1974. Both ammonia and carbon tetrachloride were released to the environment. The leaking drum of carbon tetrachloride found outside Building 551 was disposed of at an unidentified location (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

According to its MSDS, aqueous ammonia is extremely alkaline (pH=11.6). At this pH, more than 99 percent of the total ammonia (dissolved NH_3 and NH_4^+[ammonium]) exists as dissolved NH_3. The dissolved NH_3 is quickly released as NH_3 gas, which has an intense, pungent, and suffocating odor (DOE 2004b). Recognizing this potential danger, the worker unloading the ammonia from the railroad car wore a full-face respirator. It is likely that most of the ammonia released from the drum entered the atmosphere at the time of the release (DOE 2004b).

A large number of surface and subsurface soil samples were collected and analyzed around Building 551 as part of IASAP Addendum #IA-03-07 for IHSS Group 500-2 (IHSS 500-158) (DOE 2003). Samples were analyzed for VOCs (DOE 2004a). These locations were based on a statistical grid sampling design and adequately characterized this area including the associated PIC 9.

As described in the Closeout Report for IHSS Group 500-2 (DOE 2004c), no sampling locations had exceedances of VOCs. However, one sampling location had 2,600 mg/kg chromium, which exceeded the RFCA WRW soil ALs for chromium VI (268 mg/kg). The chromium hot spot was remediated in 2004 (DOE 2004c).

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002, at CDPHE that PIC 9 and 12 other PICs would undergo further analysis, and an Action/No Action Recommendation Report would be completed. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the No Action status for PIC 9 on April 30, 2004 (CDPHE 2004). The decision to approve PIC 9 for NFA was based on the review of extensive analytical data collected in this area as part of the IHSS Group 500-2 characterization activities.

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-07, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2004c, Closeout Report for IHSS Group 500-2, IHSS 500-158 Radioactive Site - Building 551, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PIC REFERENCE NUMBER: 10

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Gasoline Spill East Side of Building 662

The Final Update to the HRR for PIC 10 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 10 is summarized in this update. The following HRR volumes contain PIC 10 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

January 12, 1990

Historical Summary

The approximate location of this PIC is shown on Figure 26. An unspecified quantity of gasoline leaked from an electrician's truck near the east side of Building 662. The HAZMAT Response Team responded to the spill and the situation was corrected. The benzene content of unleaded gasoline typically ranges from 0.4 to 4.91 percent, thus this material was handled as a RCRA-regulated hazardous waste. Details of the spill and corrective actions were not included in the documentation (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 10 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 10-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 10 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up by the HAZMAT Response Team. It is very unlikely that this spill adversely impacted soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 11

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Ethylene Glycol Spill – Building 443

The Final Update to the HRR for PIC 11 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 11 is summarized in this update. The following HRR volumes contain PIC 11 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

June 25, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. Approximately 15 gallons of ethylene glycol (antifreeze) was released from the Building 443 No. 1 emergency cooling system generator. Some of the liquid was contained on the concrete pad; however, there was evidence that some drained into the rocks surrounding the pad. The antifreeze that was contained on the pad was cleaned up. The RCRA and Environmental Management Groups were notified to respond to and evaluate the release (DOE 1992). No other information could be found pertaining to this release.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004. The release to soil appeared to be minor. That is, most of the ethylene glycol was contained on the concrete pad (DOE 2004a). Ethylene glycol is not a RCRA Appendix VIII hazardous constituent, nor is it a uranium- or plutonium-chemical product that, if spilled, would make the contaminated soil a hazardous waste. The MSDS for ethylene glycol also indicates that if the product is discarded, it does not meet the definition of a characteristic hazardous waste (DOE 2004a).

Using the IRIS reference dose of 2 mg/kg/day and a HQ of 1.0, the calculated WRW AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS further states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004a).

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002, that additional research/investigation and sampling and analysis, where appropriate, would be performed for PIC 11 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the NFA status for PIC 11 on April 30, 2004 (CDPHE 2004). The rationale for the NFA concurrence was that a majority of the ethylene glycol was cleaned up while the release was on the concrete pad.

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 12

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Air Compressor Rupture – Building 440

The Final Update to the HRR for PIC 12 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 12 is summarized in this update. The following HRR volumes contain PIC 12 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

July 6, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. A small fuel oil leak occurred due to the rupture of the fuel line of a portable air compressor. The fuel spilled onto the ground east of Building 440 on July 6, 1989. The spill was immediately absorbed using "Oil-Dri®." The final disposition of the Oil-Dri® is not known (DOE 1992). No further information could be found detailing the response to this incident.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 12 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 12-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 12 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was immediately absorbed with Oil-Dri® and did not adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 13

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Oil Spill – Building 886

The Final Update to the HRR for PIC 13 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 13 is summarized in this update. The following HRR volumes contain PIC 13 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 1988

Historical Summary

The approximate location of this PIC is shown on Figure 26. A portable air compressor leaked compressor oil onto a concrete slab at Building 886. When the compressor was moved, oil-stained concrete was observed (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 13 was identified detailing the fate of the constituents released or the location.

The MSDS for compressor oil (SX68 Diester) indicates very low toxicity effects from inhalation, eye contact, skin contact and ingestion (eCompressed Air 2002). Compressor oil is non-hazardous according to the MSDS and no special warning labels are required under OSHA CFR 1910.1200. There are no referenced exposure limits for compressor oil and degradation products are carbon monoxide and carbon dioxide (eCompressed Air 2002).

PIC Investigations

No other PIC 13-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 13 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill is believed to have been minor in nature and confined to the concrete compressor slab. This release did not adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

eCompressed Air, 2002, MSDS; Compressor Oil, sales@eCompressed Air.com.

PIC REFERENCE NUMBER: 14

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Cooling Tower Water Discharge – Building 447

The Final Update to the HRR for PIC 14 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 14 is summarized in this update. The following HRR volumes contain PIC 14 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

December 2, 1958

Historical Summary

The approximate location of this PIC is shown on Figure 26. Cooling tower water from the Building 447 cooling tower was pumped into a surface ditch and allowed to flow across Plant site. Liquid was noticed in a ditch along the roadway south of Building 991. No documentation was found that further details the location of this occurrence. Building 447 cooling tower water contained sodium chromate. The liquid sampled near Building 991 contained 29 mg/L hexavalent chromium or 81 mg/L sodium chromate (DOE 1992). A temporary dam was placed across the ditch (in an unknown location) to contain the chromate-contaminated water and allow it to seep into the ditch bottom.

Aerial photographs and a site visit did not provide definitive information on the location of this discharge. It is thought that the cooling tower water was discharged into the ditch located south of Building 447 then flowed east to the railroad tracks, north to Cottonwood Avenue, and then east under Sixth Street to the western edge of Parking Lot Number 444. From this point, it is believed to have flowed north under Cottonwood Avenue and then east along the northern side of Cottonwood Avenue to Seventh Street. The flow is believed to have gone north along the western side of Seventh Street to a point adjacent to Tank 224, where it crossed under Seventh Street and flowed northeast into the Central Avenue Ditch at a point northwest of Building 675. The flow is then believed to have traveled east in the Central Avenue Ditch to a point south of Building 991. It is unknown how far beyond this point the water traveled (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 14 was identified detailing the fate of the constituents released or the location.

PIC Investigations

A review of available documentation was conducted in 2004. The measurement of 29 ppm of hexavalent chromium in water near Building 991 is likely representative of the concentration of this compound that was released at Building 447. Because the release took place in December, a generally dry and cold month, there would have been little to no water flowing in the ditches to dilute the cooling tower water. The fact that "liquid was noticed in a ditch along the roadway south of Building 991" implies there was no other flow except the released cooling tower water. A typical concentration of zinc chromate used in cooling towers as a corrosion inhibitor is 20 mg/L, which further indicates the measured concentration of hexavalent chromium at Building 991 is representative of the hexavalent chromium in the cooling tower water.

Chromate is an anion and is weakly sorbed to soil (that is, it would not tend to concentrate). If the cooling tower water saturated the soil (filled the void space), the concentration of chromate per unit weight of soil would be less than the concentration in water because the water only occupies a fraction of the total volume of saturated soil (DOE 2004b).

No Further Action Recommendation

There is no hexavalent chromium contamination in groundwater near the cooling tower water flow pathway exceeding the RFCA Tier I AL (10 mg/L). Figure 2.19 of the 2004 HRR Update (DOE 2004a) identifies locations where metals have exceeded the Tier I ALs for groundwater. Chromium only exceeded its Tier I AL near the SEP, which is nowhere near the flow path of the released cooling tower water.

After review of the PICs Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the No Action status for PIC 14 on April 30, 2004 (CDPHE 2004). Rationale for NFA approval was based on the review of analytical data.

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

PIC REFERENCE NUMBER: 15

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Process Waste Leak between Buildings 881 and 559

The Final Update to the HRR for PIC 15 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 15 is summarized in this update. The following HRR volumes contain PIC 15 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

January 1981

Historical Summary

The approximate location of this PIC is shown on Figure 26. Liquid was observed in a valve pit (the valve pit location is unknown) that services a process waste pipeline located between Buildings 881 and 559. After pumping out the pit, flow was observed between the inner pipeline and the outer containment pipeline. A leak was found in the inner process waste pipeline near Eighth Street and Central Avenue west of Building 881. Even though the leak was indicated to be in the inner pipeline, airborne radioactivity was detected during the excavation. One total long-lived alpha activity concentration from a portable air sampler exceeded the shutdown level (DOE 1992). The response to this incident included pumping the liquid out of the valve pit, excavating and locating the inner pipeline leak, and repairing the pipeline (DOE 1992).

The event was designated as a PIC because the location of the release (and valve pit) could not be determined during the HRR investigation in 1992. The references indicate the release occurred from the new process waste transfer system (that is, secondary containment is mentioned). Also, the references describe the excavation as being extensive along Eighth Street, indicating the release was likely from either Valve Vault 1 or Valve Vault 2.

PIC Investigations

PIC 15 is described in the 1992 HRR for IHSS 000-162 text (DOE 1992). PIC 15 is located within IHSS 000-162 and was addressed during characterization sampling for IHSS Group 000-4 (refer to IHSS Group 000-4 Closeout Report; DOE 2005). Based on the overall description of PIC 15, the most likely location of the NPWL line break has been removed under IHSS Group 000-4 field activities.

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002, that additional research/investigation and sampling and analysis, where appropriate, would be performed for PIC 15 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the No Action status for PIC 15 on April 30, 2004 (CDPHE 2004). The decision for approving PIC 15 was based on the overlapping IHSS 000-162 and PAC 000-504 approved sampling and characterization activities in the immediate area of Valve Vaults 1 and 2.

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-11, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2005, Closeout Report for IHSS Group 000-4, New Process Waste Lines, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

PIC REFERENCE NUMBER: 16

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Picric Acid Burn Site

The Final Update to the HRR for PIC 16 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 16 is summarized in this update. The following HRR volumes contain PIC 16 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

June 1956

Historical Summary

The approximate location of this PIC is shown on Figure 26. Picric acid from Building 771 was disposed of by burning in a small open pit. This took place at an unknown location east of the patrol fence (PSZ inner fence). The reference describes 0.5 lb of picric acid being disposed of by burning. The concentration of the acid was not known (DOE 1992). Picric acid was used in the laboratories; however, no specific use could be identified. In addition the acid can be highly explosive if undiluted and was likely burned as a safe method of disposal. No other documentation was identified pertaining to this occurrence.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 16 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 16-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 16 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the amount of picric acid (0.5 lb) did not likely adversely impact soil or water when burned in 1956. Additionally, PIC 16 and IHSS 900-153 (Oil Burn Pit No. 2) are believed to be overlapping sites and IHSS 900-153 was characterized and remediated in accordance with IHSS Group 900-2 (DOE 2005). See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005, Closeout Report for IHSS Group 900-2, IHSS 153 - Oil Burn Pit No. 2, and IHSS 154 - Pallet Burn Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

PIC REFERENCE NUMBER: 17

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Sewer Line Break – Building 771

The Final Update to the HRR for PIC 17 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 17 is summarized in this update. The following HRR volumes contain PIC 17 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

Approximately November 1977

Historical Summary

The approximate location of this PIC is shown on Figure 26. A water sample was collected near Gate 20 of Building 771 to determine the total long-lived alpha activity and gross beta activity of water released from a sewer line break. Results indicated 27 pCi/L total long-lived alpha activity and 68 pCi/L gross beta activity (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

PIC 17 is part of IHSS 000-500 (Sanitary Sewer System). The Sanitary Sewer System was approved for NFAA on March 21, 2005 (CDPHE 2005). In addition, PIC 17 is within PAC 150.2N and was sampled in accordance with the IASAP Addendum for IHSS Group 700-4. There were no detections above the RFCA WRW soil ALs (DOE 2004a).

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002, that additional research/investigation and sampling and analysis, where appropriate, would be performed for PIC 17 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the No Action warranted status for PIC 17 on April 30, 2004 (CDPHE 2004c). NFA approval was based upon review of analytical data (mentioned above) and the fact that there were no detections above the RFCA WRW soil ALs (DOE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

CDPHE, 2005, Approval Letter for NFAA Request of the Sanitary Sewer System, PAC 000-500, IHSS Group 000-3, March 21.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

DOE, 2004c, ER RSOP Notification and Closeout Report for IHSS Group 700-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

PIC REFERENCE NUMBER: 18

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Carbon Tetrachloride Spill – Building 776

The Final Update to the HRR for PIC 18 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 18 is summarized in this update. The following HRR volumes contain PIC 18 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

July 21, 1964

Historical Summary

The approximate location of this PIC is shown on Figure 26. Radioactively contaminated carbon tetrachloride spilled from a 5-gallon can in the Building 776 solvent storage area during sampling. Two square feet of ground were contaminated. The 5-gallon can of solvent was double-bagged and sent to Building 771. The contaminated ground was covered with gravel (DOE 1992). No additional documentation was found pertaining to this occurrence.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004. The 5-gallon can was used to sample solvent in the Building 776 solvent storage area. The solvent storage area is believed to be within or very near PAC 700-118.1 (Multiple Solvent Spills West of Building 730) located on the western side of Building 730 and north of Building 776. Numerous releases of carbon tetrachloride have occurred in this area both to the subsurface and ground surface (DOE 2004a). IHSS 118.1 is part of IHSS Group 700-3, and the area was characterized and remediated through implementation of IASAP Addendum #IA-03-04 for IHSS Group 700-3 (DOE 2003) and ER RSOP Notification #04-04 for IHSS Group 700-3.

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002 that additional research/investigation and where appropriate, sampling and analysis would be performed for PIC 18 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report

(DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the no action status for PIC 18 on April 30, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-04, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

PIC REFERENCE NUMBER: 19

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Contaminated Vehicles – Building 331

The Final Update to the HRR for PIC 19 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 19 is summarized in this update. The following HRR volumes contain PIC 19 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

May 1954

Historical Summary

The approximate location of this PIC is shown on Figure 26. While conducting a radiation survey at Building 331, several vehicles were found to be radiologically contaminated. The highest maximum direct count activity (1,200 cpm) was found on a truck used for transporting contaminated barrels. Two surveys were conducted and a total of 10 smears were collected (DOE 1992). No other information could be found relating to this incident.

The event was designated as a PIC because the source of the contamination was unknown and could not be determined during the HRR investigation in 1992. No additional documentation for PIC 19 has been identified detailing the disposition of the vehicles.

PIC Investigations

No other PIC 19-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 19 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the contamination appeared to be confined to the vehicle(s) rather than the building location, no source could be identified, and the radionuclides resulting in the elevated count were very likely decontaminated from the vehicle(s). See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 20

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Battery Acid Leak – Building 889

The Final Update to the HRR for PIC 20 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 20 is summarized in this update. The following HRR volumes contain PIC 20 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

July 18, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. During the transfer of batteries to Building 889, a small amount of battery acid leaked onto the asphalt near the building. The acid was neutralized and cleaned up by Waste Operations. It was determined that the amount of acid spilled was less than a reportable quantity (DOE 1992). No additional documentation was found pertaining to this incident.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 20 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 20-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 20 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up; was to asphalt, and did not adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 21

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Antifreeze Leak – Building 334

The Final Update to the HRR for PIC 21 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 21 is summarized in this update. The following HRR volumes contain PIC 21 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 22, 1990

Historical Summary

The approximate location of this PIC is shown on Figure 26. Approximately 1 gallon of ethylene glycol (antifreeze) leaked from a private vehicle onto the asphalt parking lot near Building 334. The leak was stopped and the spill was cleaned up and "disposed of properly" (DOE 1992). No additional documentation was found pertaining to this incident.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004 for a similar release (PIC 11). Using the IRIS reference dose of 2 mg/kg/day and an HQ of 1.0, the calculated WRW soil AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS further states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

No Further Action Recommendation

PIC 21 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up, was not a reportable quantity, was to asphalt and not soil, and did not adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 22

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Diesel Oil Spill North of Building 776

The Final Update to the HRR for PIC 22 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 22 is summarized in this update. The following HRR volumes contain PIC 22 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

March 19, 1986

Historical Summary

The approximate location of this PIC is shown on Figure 26. One gallon of diesel oil (fuel) was spilled in the alley north of Building 776 (DOE 1992). No other documentation was available pertaining to this incident.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 22 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 22-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 22 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was most likely absorbed (this area is heavily used by Plant personnel) and to an asphalt surface. Also, it is not likely that this spill adversely impacted soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 23

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Antifreeze Leak – Building 130D Parking Lot

The Final Update to the HRR for PIC 23 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 23 is summarized in this update. The following HRR volumes contain PIC 23 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 14, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 2 quarts of antifreeze was discovered in the parking lot south of Building 130D. A hose had ruptured on a privately owned automobile releasing the material to the asphalt. In accordance with Plant procedure, and to expedite spill removal and disposal, the material was to be handled as a RCRA-regulated hazardous waste containing lead (D008) and tetrachloroethylene (D039) if confirmed by laboratory analysis. The HAZMAT team responded and the spill was cleaned up with Oil-Dri®, packaged, and removed from the area. RCRA CPIR No. 91-011 was submitted to CDH as required per 6 CCR 1007-3, 265.56(j). The report states that the material was released to the asphalt and that there did not appear to be any threat to the environment. The packaged material was transferred to Building 334 (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004 for a similar release. Using the IRIS reference dose of 2 mg/kg/day and an HQ of 1.0, the calculated WRW soil AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS further states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

No other PIC 23-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 23 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up by the HAZMAT Response Team, was to an asphalt surface and did not likely adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 24

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Antifreeze Leak – Building 771 Parking Lot

The Final Update to the HRR for PIC 24 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 24 is summarized in this update. The following HRR volumes contain PIC 24 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 23, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 1.5 pints of antifreeze was discovered in the parking lot north of Building 771. A hose had ruptured on a privately owned automobile releasing the material to the asphalt. In accordance with Plant procedure, and to expedite spill removal and disposal, the material was to be handled as a RCRA-regulated hazardous waste containing lead (D008) and tetrachloroethylene (D039) if confirmed by laboratory analysis. The HAZMAT team responded. The spill was contained and absorbed with Oil-Dri®, packaged, and removed from the area. RCRA CPIR No. 91-012 was submitted to CDH as required per 6 CCR 1007-3, 265.56(j). The report states that the material was released to the asphalt and that there did not appear to be any threat to the environment. The packaged material was transferred to Building 334 (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004 for a similar release (PIC 11). Using the IRIS reference dose of 2 mg/kg/day and an HQ of 1.0, the calculated WRW soil AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS further states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

No other PIC 24-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 24 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up, was not a reportable quantity; and was to an asphalt surface. The spill did not likely have an adverse impact on soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 25

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Antifreeze Leak – 205 Parking Lot

The Final Update to the HRR for PIC 25 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 25 is summarized in this update. The following HRR volumes contain PIC 25 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 23, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 3 quarts of antifreeze was discovered in Parking Lot 205, east of Building 111. A hose had ruptured on a privately owned automobile releasing the material to the asphalt. In accordance with Plant procedure, and to expedite spill removal and disposal, the material was to be handled as a RCRA-regulated hazardous waste containing lead (D008) and tetrachloroethylene (D039) if confirmed by laboratory analysis. The HAZMAT team responded and the spill was contained, absorbed with Oil-Dri®, packaged, and removed from the area. RCRA CPIR No. 91-013 was submitted to CDH as required per 6 CCR 1007-3, 265.56(j). The report states that the material was released to the asphalt and that there did not appear to be any threat to the environment. The packaged material was transferred to Building 334 (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004 for a similar release (PIC 11). Using the IRIS reference dose of 2 mg/kg/day and an HQ of 1.0, the calculated WRW AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS further states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

No other PIC 25-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 25 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up, was not a reportable quantity; and was to an asphalt surface. The spill did not likely have an adverse impact on soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 26

IHSS Reference Number: Not Applicable

Current Operable Unit: BZ

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Hydraulic Oil Leak – Building 250

The Final Update to the HRR for PIC 26 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 26 is summarized in this update. The following HRR volumes contain PIC 26 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 26, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 2 quarts of hydraulic oil occurred south of Building 250 (the Windsite Facility). A hose on a tractor leaked releasing the material to the soil. The HAZMAT team responded and the spill was contained and removed from the area. Approximately 1.5 ft^3 of contaminated material was packaged. RCRA CPIR No. 91-014 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that there did not appear to be any threat to the environment. The packaged material was transferred to 90-Day Accumulation Area No. 331-1743 (DOE 1992) and was properly disposed of through the Site's waste management program.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 26 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 26-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 26 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up and was not a reportable quantity. The spill did not likely have an adverse impact on soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 27

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Hydraulic Fluid Leak – East Access Road

The Final Update to the HRR for PIC 27 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 27 is summarized in this update. The following HRR volumes contain PIC 27 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 24, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. The hose on a contractor's backhoe broke allowing hydraulic fluid to spill onto the gravel, and 2 to 3 gallons of hydraulic fluid were released to the environment (DOE 1992). No additional documentation could be found pertaining to this occurrence.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 27 was identified detailing the fate of the constituents released or the location.

The MSDS for hydraulic oil indicates low toxicity effects from inhalation, eye contact, skin contact, and ingestion (Millipore 2005). Hydraulic oil is not considered a listed hazardous waste (40 CFR, Part 261D) by EPA and used hydraulic oil is handled on a case by case basis. Further, hydraulic oil does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and does not have TCLP characteristics (Millipore 2005).

PIC Investigations

No other PIC 27-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 27 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill is believed to have been cleaned up in accordance with established Plant procedures and the RCRA Staff in place in 1989. It is unlikely that the spill had any adverse effects to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Millipore, 2005, Millipore Environment, Health and Safety, MSDS; Hydraulic Oil.

PIC REFERENCE NUMBER: 28

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Air Compressor Oil Spill – Building 865

The Final Update to the HRR for PIC 28 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 28 is summarized in this update. The following HRR volumes contain PIC 28 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 29, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A release of 1 quart of air compressor oil occurred on the pavement west of Building 865 resulting from routine oil changing operations. The air compressor oil was determined to be a RCRA-regulated hazardous waste containing lead and chromium. The HAZMAT team responded to the spill and the contaminated oil was cleaned up with absorbent material, packaged, marked, and stored in accordance with RCRA regulatory requirements. Approximately 1.2 ft^3 of contaminated material were generated during the cleanup. RCRA CPIR No. 91-017 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that the material was released to the asphalt and that there did not appear to be any threat to the environment. The packaged material was transferred to 90-Day Accumulation Area No. 331-1743 (DOE 1992) and was properly disposed of through the Site's waste management program.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 28 was identified detailing the fate of the constituents released or the location.

The MSDS for compressor oil (SX68 Diester) indicates very low toxicity effects from inhalation, eye contact, skin contact, and ingestion (eCompressed Air 2002). Compressor oil is non-hazardous according to the MSDS and no special warning labels are required under OSHA CFR 1910.1200. There are no referenced exposure limits for compressor oil and degradation products are carbon monoxide and carbon dioxide (eCompressed Air 2002).

PIC Investigations

No other PIC 28-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 28 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up, was not a reportable quantity; and was to an asphalt surface. The spill did not likely have an adverse impact on soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

eCompressed Air, 2002, MSDS; Compressor Oil, sales@eCompressed Air.com.

PIC REFERENCE NUMBER: 29

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Transmission Fluid Spill - Building 331

The Final Update to the HRR for PIC 29 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 29 is summarized in this update. The following HRR volumes contain PIC 29 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 4, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 3 gallons of transmission fluid occurred in an area east of Building 131. Transmission failure of a contractor's vehicle resulted in the release of the material to the asphalt and concrete. Approximately 2 ft^3 of waste material was removed and handled as RCRA-regulated hazardous waste containing lead and chromium. The contaminated soil was containerized and removed from the area. RCRA CPIR No. 91-019 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The packaged material was transferred to the Building 331 90-day accumulation area and was properly disposed of through the Site's waste management program. The report states that no threat to the environment should remain (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 29 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 29-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 29 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up, was not a reportable quantity; and was to an asphalt/concrete surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 30

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Hydraulic Oil Spill – Building 115

The Final Update to the HRR for PIC 30 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 30 is summarized in this update. The following HRR volumes contain PIC 30 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 12, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 1 gallon of hydraulic oil occurred in an area west of Building 115. The release was from a broken oil line on a contractor's backhoe which released the material to the surrounding soil. The spill consisted of roughly 1 gallon of hydraulic oil that was determined to be a RCRA-regulated hazardous waste. Approximately 3 ft^3 of waste material was generated, containerized, and removed from the area. RCRA CPIR No. 91-020 was submitted to CDH as required per 6 CCR 1007-3, 265.56(j). The packaged material was transferred to 90-Day Accumulation Area No. 331-1743 and was properly disposed of through the Site's waste management program. The report states that no threat to the environment should remain (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 30 was identified detailing the fate of the constituents released or the location.

The MSDS for hydraulic oil indicates low toxicity effects from inhalation, eye contact, skin contact and ingestion (Millipore 2005). Hydraulic oil is not considered a listed hazardous waste (40 CFR, Part 261D) by EPA and used hydraulic oil is handled on a case by case basis. Further, hydraulic oil does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and does not have TCLP characteristics (Millipore 2005).

PIC Investigations

No other PIC 30-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 30 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was

justified because the spill was cleaned up by the HAZMAT Response Team and was not a reportable quantity (that is, approximately 1 gallon). The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Millipore, 2005, Millipore Environment, Health and Safety, MSDS; Hydraulic Oil.

PIC REFERENCE NUMBER: 31

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Hydraulic Oil Spill – Building 125

The Final Update to the HRR for PIC 31 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 31 is summarized in this update. The following HRR volumes contain PIC 31 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 17, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 1 gallon of hydraulic oil occurred south of Building 125. A leaking hose on a trash truck resulted in a release of the material to the asphalt. The spill consisted of roughly 1 gallon of hydraulic oil that was determined to be a RCRA-regulated hazardous waste. The HAZMAT team responded. The spill was absorbed and approximately 1.5 ft^3 of waste material was containerized and removed from the area. RCRA CPIR No. 91-021 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The packaged material was transferred to 90-Day Accumulation Area No. 331-1743 and was properly disposed of through the Site's waste management program. The report states that no threat to the environment should remain (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 31 was identified detailing the fate of the constituents released or the location.

The MSDS for hydraulic oil indicates low toxicity effects from inhalation, eye contact, skin contact, and ingestion (Millipore 2005). Hydraulic oil is not considered a listed hazardous waste (40 CFR, Part 261D) by EPA and used hydraulic oil is handled on a case by case basis. Further, hydraulic oil does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity and does not have TCLP characteristics (Millipore 2005).

PIC Investigations

No other PIC 31-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 31 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was

justified because the spill was cleaned up by the HAZMAT Response Team, was not a reportable quantity, and was to an asphalt surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Millipore, 2005, Millipore Environment, Health and Safety, MSDS; Hydraulic Oil.

PIC REFERENCE NUMBER: 32

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Hydraulic Oil Spill Between the 904 Pad and Building 331

The Final Update to the HRR for PIC 32 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 32 is summarized in this update. The following HRR volumes contain PIC 32 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 24, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 10 gallons of hydraulic oil occurred while a trash truck was in transit between Building 331 and the 904 Pad. The majority of the spill occurred southwest of the 904 Pad near the contractor's trailers. Less than 1 pint of oil was released to the Building 331 parking lot. Approximately 75 ft^3 of waste material was removed. The contaminated material at the 904 Pad was containerized in ten 55-gallon drums and removed from the area. An oil pan was placed beneath the vehicle at Building 331 to containerize the rest of the leak. The truck was repaired on September 25, 1991. RCRA CPIR No. 91-022 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The packaged material was transferred to a 90-day accumulation area near Building 331 and was properly disposed of through the Site's waste management program. The report states that no threat to the environment should remain (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 32 was identified detailing the fate of the constituents released or the location.

The MSDS for hydraulic oil indicates low toxicity effects from inhalation, eye contact, skin contact, and ingestion (Millipore 2005). Hydraulic oil is not considered a listed hazardous waste (40 CFR, Part 261D) by EPA and used hydraulic oil is handled on a case by case basis. Further, hydraulic oil does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity and does not have TCLP characteristics (Millipore 2005).

PIC Investigations

No other PIC 32-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 32 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up by the HAZMAT Response Team and was partially to an asphalt surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Millipore, 2005, Millipore Environment, Health and Safety, MSDS; Hydraulic Oil.

PIC REFERENCE NUMBER: 33

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Gasoline Leak – T130 Parking Lot

The Final Update to the HRR for PIC 33 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 33 is summarized in this update. The following HRR volumes contain PIC 33 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 30, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 0.5 gallon of gasoline occurred in the north parking lot of the 130- trailer complex. The fuel pump failed on a private vehicle, releasing gasoline onto the pavement. The spill consisted of roughly 0.5 gallon of gasoline. Approximately 1 ft^3 of waste material was removed and handled as a RCRA-regulated hazardous waste because of its benzene content. The benzene content of unleaded gasoline typically ranges from 0.4 to 4.91 percent. The spill was contained and removed from the area. RCRA CPIR No. 91-024 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that the material was released to the pavement and that there did not appear to be any threat to the environment. The packaged material was transferred to 90-Day Accumulation Area No. 331-1743 and was properly disposed of through the Site's waste management program.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 33 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 33-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 33 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up by the HAZMAT Response Team and was to an asphalt surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 34

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Antifreeze Leak – Portal 1

The Final Update to the HRR for PIC 34 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 34 is summarized in this update. The following HRR volumes contain PIC 34 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 10, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 1 gallon of a 50 percent antifreeze/50 percent water mixture occurred at the north entrance to Portal 1. A small cut was found on the hose of a privately owned automobile releasing the material to the asphalt. In accordance with Plant procedure, and to expedite spill removal and disposal, the material was to be handled as a RCRA-regulated hazardous waste containing lead (D008) and tetrachloroethylene (D039) if confirmed by laboratory analysis. The HAZMAT team responded and the spill was contained. Approximately 4 pounds of material was removed from the area. RCRA CPIR No. 91-025 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that the material was released to the asphalt and that there did not appear to be any threat to the environment. The packaged material was transferred to Building 334 (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004 for a similar release (PIC 11). Using the IRIS reference dose of 2 mg/kg/day and an HQ of 1.0, the calculated WRW AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS further states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

No other PIC 34-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 34 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up by the HAZMAT Response Team and was to an asphalt surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 35

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Decontamination Water Spill

The Final Update to the HRR for PIC 35 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 35 is summarized in this update. The following HRR volumes contain PIC 35 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 9, 1991

Historical Summary:

The approximate location of this PIC is shown on Figure 26. While transporting decontamination water from the decontamination facility to the Building 231 storage tanks, a tanker truck spilled approximately 5 gallons of the liquid. Because the clamp-down device on the tanker's port fill had not been tightened, water splashed out onto the pavement when the tanker stopped. A witness described 1 to 2 gallons spilling out at one such stop. The route taken by the vehicle required five stops; therefore, it was assumed a total of 5 gallons was released. Analytical results of the water indicated 18 ppb trichloroethene. At the decontamination facility, workers had just previously decontaminated drilling equipment that had been used at the OU 1 and OU 2 sites. During decontamination procedures, approximately 1.5 lbs of waste were generated and handled as a hazardous waste for spent halogenated solvents (DOE 1992).

Because the exact locations of the spills were not known, and the material had evaporated before cleanup could take place, the asphalt was not remediated. The tanker truck was cleaned with Kimwipes and samples of the decontamination water were taken and sent to a laboratory. The material used to clean the tanker was packaged, marked, and stored according to RCRA requirements (DOE 1992). RCRA CPIR No. 91-026 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that there did not appear to be any threat to the environment due to the small quantities of hazardous material released.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 35 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 35-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 35 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spilled decontamination rinse water evaporated on the asphalt street before the HAZMAT Response Team could be notified. Also, the highest known contaminant in the water was 18 ppb trichloroethene. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 36

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Antifreeze Leak – Building 886 Parking Lot

The Final Update to the HRR for PIC 36 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 36 is summarized in this update. The following HRR volumes contain PIC 36 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 11, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. An antifreeze leak occurred from a private vehicle at the parking lot east of Building 886 because of a loose hose clamp. The release consisted of approximately 1.5 gallons of a 50 percent water/50 percent ethylene glycol solution. In accordance with Plant procedure, and to expedite spill removal and disposal, the material was to be handled as a RCRA-regulated hazardous waste containing lead (D008) and tetrachloroethylene (D039) if confirmed by laboratory analysis. The HAZMAT team responded to the spill and the material was contained, removed, and packaged according to RCRA regulatory requirements. Roughly 0.5 ft^3 of material was generated during the cleanup. The vehicle was repaired so it could be moved offsite. RCRA CPIR No. 91-027 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that the material was released to the asphalt and that there did not appear to be any threat to the environment (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004 for a similar release. Using the IRIS reference dose of 2 mg/kg/day and an HQ of 1.0, the calculated WRW AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS further states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

No other PIC 36-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 36 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up by the HAZMAT Response Team and was to an asphalt surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 37

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Gasoline Leak Near 555 Power Substation

The Final Update to the HRR for PIC 37 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 37 is summarized in this update. The following HRR volumes contain PIC 37 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 17, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 0.5 gallon of gasoline occurred from a private vehicle in the ditch east of the 555 Power Substation. The angle at which the vehicle was parked allowed the material to leak out the filler spout onto the ground. The spill was contained and approximately 40 gallon containers of saturated soil was removed. The benzene content of unleaded gasoline typically ranges from 0.4 to 4.91 percent, thus this material was handled as a RCRA-regulated hazardous waste. RCRA CPIR No. 91-028 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that there did not appear to be any threat to the environment. The packaged material was transferred to 90-Day Accumulation Area No. 331-1743 (DOE 1992) and was properly disposed of through the Site's waste management program.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 37 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 37-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 37 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up and consisted of approximately 2 quarts of gasoline. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 38

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Air Compressor Leak - Building 440

The Final Update to the HRR for PIC 38 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 38 is summarized in this update. The following HRR volumes contain PIC 38 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 21, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 1.5 gallons of motor oil from an air compressor occurred north of Building 440. The oil reservoir was overpressurized allowing the oil to be forced out through the dipstick tube onto the pavement. Approximately 1.5 gallons of 10W40 motor oil was released. The oil was cleaned up with an absorbent material, containerized, and removed from the area. During the cleanup, roughly 3 ft^3 of material was generated that was to be handled as a RCRA-regulated hazardous waste with toxicity characteristics for chromium and lead (not confirmed by laboratory analysis). RCRA CPIR No. 91-029 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that the material was released to the asphalt and that there did not appear to be any threat to the environment (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 38 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 38-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 38 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up and was to an asphalt surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 39

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Motor Oil Leak – 441 Parking Lot

The Final Update to the HRR for PIC 39 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 39 is summarized in this update. The following HRR volumes contain PIC 39 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 29, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 1 quart of motor oil occurred at the 441 Parking Lot. The engine oil pan of a vehicle had been severely damaged allowing the release of oil to the asphalt. The HAZMAT team responded to the release and the contaminated soil was containerized and removed from the area. The material was to be handled as a RCRA-regulated hazardous waste because it may have exceeded the TCLP standard for lead. RCRA CPIR No. 91-032 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that no threat to the environment should remain (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 39 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 39-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 39 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up by the HAZMAT Response Team and was to an asphalt surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 40

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Automatic Transmission Fluid Leak – Building 443

The Final Update to the HRR for PIC 40 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 40 is summarized in this update. The following HRR volumes contain PIC 40 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

October 29, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill of approximately 3 gallons of automatic transmission fluid from an air compressor occurred northwest of Building 443. The compressor was over-pressurized allowing the oil to spill out onto the ground. Approximately 3 gallons of automatic transmission fluid were released. The oil and contaminated soil was cleaned up, containerized, and removed from the area. The cleanup generated roughly 21 ft^3 of material that was to be handled as a RCRA-regulated hazardous waste because it could have exceeded the TCLP standards for lead and chromium. RCRA CPIR No. 91-033 was submitted to CDH as required in accordance with 6 CCR 1007-3, 265.56(j). The report states that the material was removed and that there did not appear to be any threat to the environment. The packaged material was transferred to 90-Day Accumulation Area No. 331-1743 (DOE 1992) and was properly disposed of through the Site's waste management program.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 40 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 40-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 40 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 41

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Leaking Transformer – 777-1

The Final Update to the HRR for PIC 41 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 41 is summarized in this update. The following HRR volumes contain PIC 41 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

1980 to August 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. In 1980 it was reported that Transformer 771-1 was leaking at the drain valve. In November 1985 and again in June and September 1986, Transformer 771-1 was again reported as leaking. Based upon review of the references (DOE 1992), it is apparent that the transformer in question is 777-1 and not 771-1. This updated information is documented within the 2004 HRR (DOE 2004a).

The dielectric fluid in Transformer 777-1 was analyzed (unknown date) and contained 56 ppm PCBs. The drain valve and case near the valve of the transformer was scheduled for recleaning in October 1986. Further cleanup of Transformer 777-1 took place in 2003.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992 (that is, Transformer 771-1 versus 777-1).

PIC Investigations

A review of available documentation was conducted in 2004. Transformer 777-1 contained mineral oil with PCBs at levels slightly greater than the TSCA limits to be classified as PCB-contaminated (50 to 500 ppm). In 1986, leaks were repaired and cleaned up, and PCB-contaminated transformers were drained and refilled with clean mineral oil. The replacement oil in Transformer 777-1 had a PCB concentration of 2.9 ppm (DOE 2004a).

Although Transformer 777-1 was scheduled for cleanup on August 14, 1989, the transformer was not removed until November 2003 (DOE 2004a). Analysis of the transformer oil in 1992 indicated a PCB concentration of only 2 ppm. An inspection of the area on March 4, 2004, indicated no visible signs of significant contamination on the pad or surrounding soil (DOE 2004a). The low concentration of PCBs in the original oil, combined with the reported

cleanup operation in 1986, was confirmed by the noted absence of staining on the pad in March 2004.

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002, that additional research/investigation and sampling and analysis, where appropriate, would be performed for PIC 41 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the No Action warranted status for PIC 41 on April 30, 2004 (CDPHE 2004). The NFA decision was made on the basis of lack of staining on the transformer concrete pad and analytical data.

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

PIC REFERENCE NUMBER: 42

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Diesel Fuel Leak – Building 460

The Final Update to the HRR for PIC 42 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 42 is summarized in this update. The following HRR volumes contain PIC 42 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

August 3, 1986

Historical Summary

The approximate location of this PIC is shown on Figure 26. A report was made of a diesel fuel leak from a tanker truck by Plant Protection personnel. The leak occurred south of Building 460 along the drainage excavation site. An estimated 100 to 150 gallons of diesel fuel leaked from the truck. Fire Department personnel constructed a dike to prevent the spread of the spill, and dirt was used to absorb the standing fuel. An interview was conducted in March 2004 (DOE 2004a) with a Plant employee who was directly involved in the incident. Specifically, the employee stated that the spill was cleaned up, the rock and soil were loaded into a dump truck, and the material was hauled off. He does not know for certain where the material was disposed (DOE 2004a).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

Under the section titled Responses to Operation or Occurrence, the original HRR notes that cleanup operations were necessary (DOE 1992). The employee interviewed in 2004 stated that cleanup was conducted during the day shift (DOE 2004a).

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002, that additional research/investigation and sampling and analysis, where appropriate, would be performed for PIC 42 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the No Action

warranted status for PIC 42 on April 30, 2004 (CDPHE 2004). The NFA decision was made on the basis of an interview (mentioned above) noting specifically, that the spill was cleaned up.

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

PIC REFERENCE NUMBER: 43

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Drum Spill – 84 Intersection

The Final Update to the HRR for PIC 43 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 43 is summarized in this update. The following HRR volumes contain PIC 43 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

December 31, 1964

Historical Summary

The approximate location of this PIC is shown on Figure 26. A spill occurred from a 30-gallon drum at the "84 intersection." It is assumed that due to the change in the building numbering system, the building the report is referring to is Building 884. This indicates the spill likely occurred at the junction of Eighth Street and Central Avenue. According to the reference, an unknown quantity of oil spilled from the drum. Analytical results indicated 3 cpm while the background was 4.33 cpm. No additional documentation could be found that pertains to the incident (DOE 1992).

The event was designated as a PIC because the exact location (that is, 84 intersection) of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 43 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 43-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 43 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was very likely to asphalt, was below background levels, and was likely cleaned up under Plant procedure. It is unlikely that this spill has had an adverse impact on soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002). The NFA decision was made on the basis that the intersection nearest Building 884 is Eighth St and Central Avenue and is/was asphalt in 1964.

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 44

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Distillate Release – Building 374

The Final Update to the HRR for PIC 44 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 44 is summarized in this update. The following HRR volumes contain PIC 44 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

September 30, 1977

Historical Summary

The approximate location of this PIC is shown on Figure 26. While transferring distillate from Building 374 to Building 774, a contractor broke a flange connected to the sump pump. Liquid was pumped to the ground south of Building 374. No personnel were contaminated. The liquid consisted of distillate that had been transferred to Building 774 on September 29, 1977. It was returned to Building 374 on September 30 because it was contaminated at 6,700 dpm/L (higher than the building could accept). One reference indicated soil samples were collected from the area; however, there is no mention of cleanup (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

The area south of Building 374 is IHSS 188, the site of a leaking drum of acid, thought to be a metal leaching solution. Five surface soil samples were collected in this area and the metal concentrations were found to be well below WRW soil ALs. IHSS 188 was approved for NFA in 1999 (DOE 2004a). In addition, radiological analysis was performed on a surface soil sample collected in this area that indicated americium-241 was detected at an activity of 0.058 pCi/g, uranium-235 at 0.312 pCi/g, and uranium-238 at 3.3 pCi/g. These concentrations are well below the respective WRW soil ALs (DOE 2004a).

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002 that additional research/investigation and sampling and analysis, where appropriate, would be performed for PIC 44 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report

would be prepared. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the No Action warranted status for PIC 44 on April 30, 2004 (CDPHE 2004).

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

PIC REFERENCE NUMBER: 45

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Asphalt Thinner Spill

The Final Update to the HRR for PIC 45 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 45 is summarized in this update. The following HRR volumes contain PIC 45 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

August 22, 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. A 5-gallon can of asphalt thinner fell off a moving construction truck and broke east of the 904 Pad, spilling the contents. The asphalt thinner was not considered hazardous material. Construction Management personnel supervised the cleanup and disposal of the spill using guidance from the RCRA/CERCLA group. The RCRA/CERCLA Program Office determined that the event was not reportable to off-site agencies (DOE 1992). No other documentation was found that detailed the cleanup operation.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 45 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 45-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 45 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up and did not likely adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 46

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Honey Wagon (Sewage Transport Truck)

The Final Update to the HRR for PIC 46 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 46 is summarized in this update. The following HRR volumes contain PIC 46 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 1989

Historical Summary

The approximate location of this PIC is shown on Figure 26. A tanker truck used to transport untreated sewage from the Wind Site to the Building 124 sewage drain had several minor leaks. The truck allowed sewage to leak onto the ground wherever it went. The sewage was transported by truck from the sanitary facilities at the Wind Site because it had no direct sewer lines or septic system (DOE 1992). No other documentation was found that provide details of responses to individual leaks or occurrences.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 46 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 46-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 46 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill(s) were not considered a hazardous waste and any spills were likely to asphalt in most cases; and did not adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 47

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Nickel Carbonyl Container Burial

The Final Update to the HRR for PIC 47 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 47 is summarized in this update. The following HRR volumes contain PIC 47 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002a); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

June 17 and 18, 1963

Historical Summary

The approximate location of this PIC is shown on Figure 26. Four 55-gallon drums, one GI can with two cylinders, and six loose cylinders of nickel carbonyl were removed from the burial pit west of Building 771 (PAC 700-1110) and taken to a pit east of the SEP (location unknown). Explosive charges were used to vent the containers and nickel carbonyl was released to the environment. Air samples were collected during the venting of the containers (DOE 1992). Nickel carbonyl is a colorless liquid with extremely toxic vapors and was used in plating and coating applications at Rocky Flats.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

The burial pit (PIC 47) is located within IHSS 900-176, the S&W Contractor Storage Yard. This IHSS was characterized along with other IHSSs as part of IHSS Group 000-1 in accordance with IASAP Addendum #IA-03-02 (DOE 2002b). A Data Summary Report was prepared that indicates nickel concentrations in soil at IHSS 900-176 ranged from 20 to 50 mg/kg (DOE 2003). The WRW soil AL is 20,000 mg/kg. The Data Summary Report was approved by CDPHE on July 29, 2003 (DOE 2004a).

Burning of the nickel carbonyl creates an aerosol of nickel oxide that would have dispersed in the atmosphere. Therefore, nickel carbonyl would not remain in the soil. The sample results do not show a source of nickel contamination in the area (DOE 2004a).

No Further Action Recommendation

It was agreed in an NFA Working Group meeting on April 3, 2002 that additional research/investigation and sampling and analysis, where appropriate, would be performed for PIC 47 and 12 other PICs. Based on the results, an Action/No Action Recommendation Report would be prepared. Upon review of the Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, CDPHE (the LRA) concurred with the No Action warranted status for PIC 47 on April 30, 2004 (CDPHE 2004). The NFA decision was made because the cylinders were documented as being vented of their contents.

Comments

None

References

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002a, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, Industrial Area Sampling and Analysis Plan Addendum #IA-03-02, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003, Data Summary Report for IHSS Group 000-1, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

PIC REFERENCE NUMBER: 48

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Antifreeze Spill – 334 Parking Lot

The Final Update to the HRR for PIC 48 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 48 is summarized in this update. The following HRR volumes contain PIC 48 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

September 27, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. On September 27, 1991, a ruptured hose on a personal vehicle released an antifreeze solution onto the surface of the Building 334 Parking Lot. Seven quarts of antifreeze solution consisting of ethylene glycol and water were released to the environment. In accordance with Plant procedure, and to expedite spill removal and disposal, the material was to be handled as a RCRA-regulated hazardous waste containing lead (D008) and tetrachloroethylene (D039) if confirmed by laboratory analysis. Plant Services and the RFP HAZMAT team contained and cleaned up the spill. Potentially contaminated materials were packaged, marked, and stored in accordance with RCRA requirements. RCRA CPIR No. 91-023 was submitted to CDH (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

A review of available documentation was conducted in 2004 for a similar release (PIC 11). Using the IRIS reference dose of 2 mg/kg/day and an HQ of 1.0, the calculated WRW AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

No other PIC 48-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 48 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was

justified because the spill was cleaned up by the HAZMAT Response Team and was to an asphalt surface. The spill did not likely have an adverse impact to soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2004, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 49

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Diesel Fuel Leak – Building 709

The Final Update to the HRR for PIC 49 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 49 is summarized in this update. The following HRR volumes contain PIC 49 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

July 17, 1991

Historical Summary

The approximate location of this PIC is shown on Figure 26. On July 17, 1991, diesel fuel was discovered leaking from an aboveground storage tank located near Building 709. A flow rate adjustment in an associated pumping system caused the release of diesel fuel from the tank vent to the surrounding soil. Approximately 1 quart of diesel fuel was released to the environment. Approximately 1 ft^3 of soil was removed and containerized. The average benzene content of most diesel fuel is approximately 4 percent, thus the waste was handled as a RCRA-regulated waste (DOE 1992). The storage tank was isolated, shut down, and repaired.

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 49 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 49-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 49 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was cleaned up and did not likely adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

None

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 50

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Process Waste Leak

The Final Update to the HRR for PIC 50 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 50 is summarized in this update. The following HRR volumes contain PIC 50 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

1971

Historical Summary

The approximate location of this PIC is shown on Figure 26. The only identifiable wording in the 1971 reference states, "Leakage from process waste tanks…No action" (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 50 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 50-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 50 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because, even though the exact location is unknown, the process waste lines and tanks are addressed in IHSS Group 000-2 (OPWL) and IHSS Group 000-4 (NPWL). See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 50 because of a lack of information. PIC 50 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 51

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Contaminated Tank

The Final Update to the HRR for PIC 51 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 51 is summarized in this update. The following HRR volumes contain PIC 51 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

January 3, 1968

Historical Summary

The approximate location of this PIC is shown on Figure 26. The outside of a 100-gallon steel tank was found to be contaminated with up to 2,000 cpm alpha activity. The only descriptive location word used was "yard" (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 51 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 51-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 51 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified for PIC 51 because the tank location (that is, yard) was very likely sampled and characterized under an existing IASAP Addendum. The two most likely locations, the PU&D Yard (IHSS 170) or the S&W Yard (IHSS 176), have both been extensively sampled and are approved NFA IHSSs. There is no evidence that the contaminated tank adversely impacted either soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 51 because of a lack of information. PIC 51 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 52

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Storm Drain Dumping

The Final Update to the HRR for PIC 52 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 52 is summarized in this update. The following HRR volumes contain PIC 52 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

June 1982

Historical Summary

The approximate location of this PIC is shown on Figure 26. The contents of 12 unidentifiable test drums were dumped in an area where the liquid entered a storm drain. The drums contained water, sand, and ethylene glycol. The generator/responsible party of the drums was told to contact Environmental Analysis prior to the disposal of any liquid to the ground; however, there is no evidence this happened (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 52 was identified detailing the fate of the constituents released or the location.

PIC Investigations

A review of available documentation was conducted in 2004 for a similar release (PIC 11). Using the IRIS reference dose of 2 mg/kg/day and an HQ of 1.0, the calculated WRW AL for ethylene glycol in soil would be 2 million ppm, a concentration that cannot be achieved. This indicates that chronic exposure by a WRW to soil saturated in ethylene glycol would not result in adverse health effects (EPA 2004). The MSDS states that ethylene glycol is nontoxic to aquatic life, has a moderate biodegradation rate, and has a low potential to bioconcentrate (DOE 2004).

No other PIC 52-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 52 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was not a reportable quantity and did not likely adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 52 because of a lack of information. PIC 52 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

EPA, 2004, Integrated Risk Information System (IRIS), Online Database, Office of Research and Development, Cincinnati, Ohio.

PIC REFERENCE NUMBER: 53

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Oil Storage Tank Overflow

The Final Update to the HRR for PIC 53 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 53 is summarized in this update. The following HRR volumes contain PIC 53 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

July 1972

Historical Summary

The approximate location of this PIC is shown on Figure 26. A 450-gallon oil storage tank overflowed while operators were pumping oil from another building to the storage tank (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 53 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 53-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 53 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because there is no way to determine where the spilled oil occurred. Further, it is unlikely that the spilled oil adversely impacted the soil or water in the area. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 53 because of a lack of information. PIC 53 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 54

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Steam Line Rupture

The Final Update to the HRR for PIC 54 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 54 is summarized in this update. The following HRR volumes contain PIC 54 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

July 1975

Historical Summary

The approximate location of this PIC is shown on Figure 26. An underground steam line ruptured spraying asphalt-based insulation on two workers (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 54 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 54-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 54 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the asphalt-based insulation was not determined to be a release of hazardous waste and did not likely adversely impact soil or water. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 54 because of a lack of information. PIC 54 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 55

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Leaking Drum Shipment

The Final Update to the HRR for PIC 55 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 55 is summarized in this update. The following HRR volumes contain PIC 55 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

March 1971

Historical Summary

The approximate location of this PIC is shown on Figure 26. The shipment of drums of waste was halted the week of March 1, 1971, because of leaking sludge drums from Building 774. Due to the repeated occurrence of leaking drums, all drums were required to be inspected prior to shipment for proper packaging, damage to liners, and free liquids. Drums that were inspected were stored under cover and away from direct sunlight (DOE 1992).

The area where the drums had leaked could not be determined during the HRR investigation in 1992; therefore, the incident(s) were designated as a PIC. No additional documentation for PIC 55 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 55-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 55 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the referenced spills most likely occurred within IHSS Group 700-4. Additionally, this area is predominantly an asphalted surface and was not likely a direct source of contamination to surface soil. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 55 due to lack of information. PIC 55 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 56

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Rio Grande Motorways Trailer Leak

The Final Update to the HRR for PIC 56 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 56 is summarized in this update. The following HRR volumes contain PIC 56 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

November 9, 1955

Historical Summary

The approximate location of this PIC is shown on Figure 26. A sample from a saturated piece of paper was collected from the floor of a Rio Grande Motorways trailer (Trailer No. 1715). The paper was suspected to be contaminated with liquid draining from Rocky Flats waste barrels associated with an accident near Dillon, Colorado, on November 3, 1955 (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. Additional information regarding the accident was, however, available at the time of this writing indicating the location of the accident was approximately 3.5 miles east of the town of Dillon, Colorado.

PIC Investigations

No other PIC 56-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 56 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the spill was confined to the bed of a truck (or trailer) and not believed to be a release to the environment. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 56 due to lack of information. PIC 56 has only been identified on Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 57

IHSS Reference Number: Not Applicable

Current Operable Unit: IA

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Oil from Spill in Cobalt-60 Pit

The Final Update to the HRR for PIC 57 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 57 is summarized in this update. The following HRR volumes contain PIC 57 information:

Original Report – 1992 (DOE 1992);
Update Report – 2002 Annual (DOE 2002); and
Update Report – 2004 Annual (DOE 2004a).

Date(s) of Operation or Occurrence

September 7, 1979

Historical Summary

The approximate location of this PIC is shown on Figure 26. On September 7, 1979, analytical results indicated 238 pCi/L (gross beta) in a sample of oil collected from a spill in the Cobalt-60 pit (believed to be in Building 444). The oil was said to be "ok" for disposal through the waste oil process in Building 774 (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992.

PIC Investigations

Building 444 manufacturing activities included welding and the use of radiography to detect flaws in depleted uranium and beryllium parts. Based on the Building 444 WSRIC Book (DOE 2004b), radiography took place in Rooms 139 and 143. Parts were x-rayed in the x-ray cell, which appears to be Room 139. Cobalt-60 is the radioisotope source of x-rays used in radiography. It is likely the floor of the x-ray cell had what is referred to as the cobalt-60 pit where the cobalt-60 source was stored until needed. Such a depression would catch oil or other liquids that might be spilled (DOE 2004b). The spilled oil was surveyed using field instruments for gross beta contamination, which further indicates the radionuclide of interest was depleted uranium. Gross beta was previously the only survey used to detect uranium-238 contamination, because the daughter products are strong beta emitters (DOE 2004a).

Because the oil release was a spill in a room, the oil was never released to subsurface soil beneath the building. Also, the reference implies that the spill was cleaned up (that is, it was "OK to dispose of the oil at Building 774") (DOE 2004a). The sample collection and analysis performed as part of the IHSS Group 400-3 includes potential spill areas and demonstrates that there is no need for additional action. The Data Summary Report for IHSS Group 400-3, which

includes UBC 444, indicates the IHSS Group is an NFA Site (DOE 2003). The Data Summary Report was approved by CDPHE on December 18, 2003 (CDPHE 2003).

No Further Action Recommendation

Based on the above information, after review of the PICs Action/No Action Recommendations Report (DOE 2004b) by the regulatory agencies, DOE received concurrence from CDPHE (the LRA) of the No Action warranted status for PIC 57 on April 30, 2004 (CDPHE 2004).

Comments

The 1992 HRR did not include a narrative for PIC 56 due to lack of information. Until this reporting period, PIC 56 had only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE, 2003, Approval Letter of the Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December 18.

CDPHE, 2004, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE, RE: Potential Incidents of Concern (PICs), 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, April 30.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Data Summary Report for IHSS Group 400-3, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004a, Historical Release Report Annual Update, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004b, Potential Incidents of Concern 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, and 57 Action/No Action Recommendations, Rocky Flats Environmental Technology Site, Golden, Colorado, April 15.

PIC REFERENCE NUMBER: 58

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Contaminated Soil

The Final Update to the HRR for PIC 58 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 58 is summarized in this update. The following HRR volumes contain PIC 58 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

June 1973

Historical Summary

The approximate location of this PIC is shown on Figure 26. Contaminated soil was identified in an unidentified barrel storage area. Once identified, the soil was packaged for off-site shipment (DOE 1992).

The event was designated as a PIC because the exact location (barrel storage area) of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 58 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 58-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 58 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because the contaminated soil was remediated and packaged for off-site disposal. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 58 due to lack of information. PIC 58 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 59

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Holes by Sump Pit

The Final Update to the HRR for PIC 59 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 59 is summarized in this update. The following HRR volumes contain PIC 59 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

July 8, 1971

Historical Summary

The approximate location of this PIC is shown on Figure 26. On July 8, 1971, two "check holes" were drilled in the ground next to Sump Pit 2. Both holes encountered water flow rates of 40 gpm. No other information is available (DOE 1992).

The event was designated as a PIC because the exact location (Sump Pit 2) could not be determined during the HRR investigation in 1992. No additional documentation for PIC 59 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 59-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 59 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because there was no contamination identified or mentioned in the reference. Further, it is likely that the water pressure noted during the drilling operation was from a ruptured water line. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 59 due to lack of information. PIC 59 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 60

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Trailer Tank 201

The Final Update to the HRR for PIC 60 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 60 is summarized in this update. The following HRR volumes contain PIC 60 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

Unknown

Historical Summary

The approximate location of this PIC is shown on Figure 26. A document was identified that describes a "Trailer Tank 201" overflowing between 5 and 10 gallons of process waste. The activity of the wastes measured approximately 30,000 dpm. No other information is available (DOE 1992).

The event was designated as a PIC because the exact location of the release could not be determined during the HRR investigation in 1992. No additional documentation for PIC 60 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 60-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 60 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because potential contamination from the release (area unknown) would very likely be within the boundary of IHSS Group 000-2 (OPWLs) or IHSS Group 000-4 (NPWLs). See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 60 due to lack of information. PIC 60 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

PIC REFERENCE NUMBER: 61

IHSS Reference Number: Not Applicable

Current Operable Unit: Unknown

Former Operable Unit: Not Applicable

IHSS Group: Not Applicable

Unit Name: Tank Photographs

The Final Update to the HRR for PIC 61 consolidates the information in the initial 1992 HRR and subsequent updates with information gained through the disposition of this PIC in accordance with the RFCA accelerated action process. The disposition of PIC 61 is summarized in this update. The following HRR volumes contain PIC 61 information:

Original Report – 1992 (DOE 1992); and
Update Report – 2002 Annual (DOE 2002).

Date(s) of Operation or Occurrence

July 8, 1975

Historical Summary

The approximate location of this PIC is shown on Figure 26. On July 8, 1975, photographs depicting the removal of a UST show that the tank had holes in it indicating a potential release. The origin of the tank and constituents released is unknown (DOE 1992).

The event was designated as a PIC because the exact location of the release (if any) could not be determined during the HRR investigation in 1992. No additional documentation for PIC 61 was identified detailing the fate of the constituents released or the location.

PIC Investigations

No other PIC 61-specific investigation was deemed necessary.

No Further Action Recommendation

PIC 61 was addressed using the consultative process in an NFA Working Group meeting on April 3, 2002, at CDPHE. Based on these discussions, agreement was reached that an NFA was justified because a spill or release to the environment could not be confirmed. See NFA approval letter dated September 26, 2002 (CDPHE and EPA 2002).

Comments

The 1992 HRR did not include a narrative for PIC 61 due to lack of information. PIC 61 has only been identified in Table PIC-2 of the 1992 HRR (DOE 1992).

References

CDPHE and EPA, 2002, Correspondence to J. Legare, DOE RFFO, from S. Gunderson, CDPHE and T. Rehder, EPA Region VIII, and, RE: Approval of NFA Designation for IHSSs, PACs, and PICs, September 26.

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

DOE, 2002, Annual Update to the Historical Release Report, August 1, 2001, through August 1, 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Figure 27
Buffer Zone Contamination Report Site Locations

CDPHE BUFFER ZONE CONTAMINATION REPORTS

This section documents the actions taken and disposition of 36 potential Buffer Zone Contamination Report (BZCR) sites submitted to DOE by CDPHE in a report dated August 1999 (CDPHE 1999), and five additional sites submitted to DOE by CDPHE on April 23, 2003 (CDPHE 2003). The sites (in most cases) are areas of disturbed soil that were identified by CDPHE upon review of aerial photographs. The location of the BZCR sites is shown on Figure 27. A complete discussion of the 1999 sites (with DOE's responses) is located in Section 3.0 of the 2001 Annual Update to the HRR (DOE 2001) and is not repeated in this section. Response to concerns regarding the additional five 2003 BZCR locations was approved by the regulatory agencies on May 11, 2004 (CDPHE and EPA 1994).

Disposition of BZCR Sites

The potential contamination sites in the order they were listed in the 1999 report are identified below. The additional sites identified in 2003 are numbered 1(a) through 5(a) and are at the end of this list. The BZCR site ID, a description, investigative actions taken, and the disposition decision and date for each site is listed below. Approval letters and other pertinent documents are referenced in footnotes in the table. All referenced documents are available in the AR File.

Buffer Zone Contamination Report Sites (CDPHE 1999, 2003)

BZCR ID	Description	Action Taken	Final Disposition and Date
BZCR Site 1 1999	Disturbed Ground SE of IA (CDPHE 1999)	Site identified as the East Firing Range. Designated as new PAC SE-1602. Characterized and remediated under IHSS Group 900-11.	Approved NFAA February 8, 2005 (EPA 2005a)
BZCR Site 2 1999	Disturbed Ground NW of IA (Lindsay Ranch) (CDPHE 1999)	Performed "survey/sweep" for unexploded ordinance. Spent ammunition picked up in 2002 (DOE 2001).	Debris was cleaned up on 8/20/02 and documented in 2002 HRR (DOE 2002). No further investigation is warranted.
BZCR Site 3 1999	Disturbed Areas SW of Building 881 (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss findings. The areas in question were agreed to be engineered drainage structures for the B850 Parking Lot.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 4 1999	Disturbed Ground N of IHSS 119.1 (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss findings. There are no RFCA soil AL exceedances from the 56 samples collected in this area.	No further investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 5 1999	Disturbed Area Identified as Concrete Spoils within the 903 Lip Area (IHSS 900-155) (CDPHE 1999)	Agreed to investigate/remediate with IHSS 155 (903 Lip Area) (RCR, 1/10/2001, CDPHE 2001). Concrete removal and sampling performed in 2004. All results less than RFCA soil ALs.	Documented completion of work with CDPHE September 20, 2004 (DOE 2004a).
BZCR Site 6 1999	Disturbed Area(s) Identified E of IHSS 111.3 (CDPHE 1999)	Samples collected in accordance with BZCR SAP (March 25, 2002) (K-H 2002). All results less than RFCA soil ALs. *Note: the May 3, 2001 responses (CDPHE 2001) indicate characterization will be with IHSS 216.3.*	Documented completion of sampling with CDPHE September 16, 2004 (DOE 2004b).
BZCR Site 7 1999	Disturbed Area Identified NW of IA (CDPHE 1999)	Samples collected in accordance with BZCR SAP (March 25, 2002) (K-H 2002). All results less than RFCA soil ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b).
BZCR Site 8 1999	Disturbed Area Identified S of Present Landfill (IHSS 114) (CDPHE 1999)	Samples collected in accordance with BZCR SAP (March 25, 2002) (K-H 2002). All results less than RFCA ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b).
BZCR Site 9 1999	Disturbed Area Identified SW of Present Landfill (IHSS 114) and E of IHSS 170 (PU&D Yard) (CDPHE 1999)	Samples collected in accordance with BZCR SAP (March 25, 2002) (K-H 2002). All results less than RFCA ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b).

BZCR ID	Description	Action Taken	Final Disposition and Date
BZCR Site 10 1999	Disturbed Area W of IA and IHSS 170 (PU&D Yard). The Site is the Location of the Concrete Batching Plant (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings. The site has been reconfigured as part of the final grading plan.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 11 1999	Small Arms Range Located N of the IA (CDPHE 1999)	This site was designated as a new PAC NW-1505 on January 10, 2001 (RCR, 1/10/2001, CDPHE 2001). Characterization samples were collected in 2005 in accordance with the IHSS Group NE-1, SAP (DOE 2004 c) and soil was remediated at several locations to below WRW soil ALs.	A Closeout Report was submitted and approved (EPA 2005a), which addresses this site (IHSS Group NE-1) (DOE 2005b).
BZCR Site 12 1999	Small Pond Identified on Aerial Photograph NE of IA (CDPHE 1999)	Samples collected in accordance with BZCR SAP (March 25, 2002) (K-H 2002). All results less than RFCA ALs.	Documented with CDPHE September 16, 2004 (DOE 2004b).
BZCR Site 13 1999	Disturbed Area(s) S-SE of IA (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings. This Site was intended to be used as a radio tower location but not utilized.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 14 1999	Disturbed Area(s) W of IA and N of IHSS 133.5 (CDPHE 1999)	Inspected North Side area and used RFCA consultative process to discuss and assess findings. Agreed to No Further Investigation for North Side (January 10, 2001) (RCR, 1/10/2001, CDPHE 2001). Samples collected in accordance with BZCR SAP for South Side (March 25, 2002) (K-H 2002). All results less than RFCA soil ALs.	No other investigation required for North Side agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001). Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b). Additional samples were collected in this area and referenced in the Closeout report for the Incinerator Facility (IHSS Group SW-1) (DOE 2003b).
BZCR Site 15 1999	Disturbed Area W of IA, N of Walnut Creek (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 16 1999	Elongated Disturbed Area E of the IA (CDPHE 1999)	Samples collected in accordance with BZCR SAP for South Side (March 25, 2002) (K-H 2002). All results less than RFCA ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b).

BZCR ID	Description	Action Taken	Final Disposition and Date
BZCR Site 17 1999	A Structure Identified SE of the IA (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 18 1999	A Structure Identified SE of the IA (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 19 1999	Possible Ash Disposal Area or Concrete Spoil area W of IHSSs 133.5 and 133.6 (CDPHE 1999)	Samples collected in accordance with BZCR SAP for South Side (March 25, 2002) (K-H 2002). All results less than RFCA ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b). An NFA Decision for the Ash Pits was approved on June 12, 2003 (EPA 2003a).
BZCR Site 20 1999	Numerous (hundreds) of Disturbed Areas in W BZ (on and off DOE Property). Possibly Prairie Dog Colony (CDPHE 1999)	Performed research and documented ecological explanation.	Explanation provided in 2001 Historical Release Report (DOE 2001, DOE 2004d). Refer also to Site 1a for additional information.
BZCR Site 21 1999	Two Areas of Disturbed Ground SW of IA (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 22 1999	Large Excavation W of the IA (CDPHE 1999)	Investigation determined site to be operational gravel pit not related to RFETS.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 23 1999	Possible Waste Disposal Area W of the IA (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 24 1999	Areas of Possible Fill Material N-NW of the IA (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 25 1999	Disturbed Area N of the IA and N of the Landfill Pond (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 10, 2001 (RCR, 1/10/2001, CDPHE 2001).

BZCR ID	Description	Action Taken	Final Disposition and Date
BZCR Site 26 1999	Disturbed ground NE of the IA and N of Walnut Creek (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 27 1999	Disturbed Ground NE of the IA and N of Walnut Creek (IHSS 142.3) (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 28 1999	Change in Surface Features/Outfall Locations to bypass South Walnut Creek Ponds (CDPHE 1999)	Samples collected in accordance with BZCR SAP for South Side (March 25, 2002) (K-H 2002). All results less than RFCA soil ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b).
BZCR Site 29 1999	Disturbed Ground NW of the IA (determined to be "Met Tower" (Identified in Operable Unit 11 RI Report) (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 30 1999	Disturbed Ground N of Parking Lot on North Side of the IA (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 31 1999	Disturbed Ground NW of the IA (near or within PAC 300-700) (CDPHE 1999)	Samples collected in accordance with BZCR SAP for South Side (March 25, 2002) (K-H 2002). All results less than RFCA soil ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b).
BZCR Site 32 1999	Possible Waste Disposal Area SW of the IA (near the Ash Pits) (CDPHE 1999)	Samples collected in accordance with BZCR SAP for South Side (March 25, 2002 (K-H 2002). *Note: the May 3, 2001 responses indicate characterization would be with IHSS 133 (Ash Pits)* (CDPHE 2001) (EPA 2003a). All results less than RFCA ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b). NFAA approved for Ash Pits, June 12, 2003 (EPA 2003a).
BZCR Site 33 1999	Possible Waste Disposal Area(s) SW of the IA (near the Ash Pits) (CDPHE 1999)	Samples collected in accordance with BZCR SAP for South Side (March 25, 2002) (K-H 2002). *Note: the May 3, 2001 responses indicate characterization will be with IHSS 133 (Ash Pits)* (CDPHE 2001) (EPA 2003a). All results less than RFCA ALs.	Documented completion of sampling and analysis with CDPHE September 16, 2004 (DOE 2004b). NFAA approved for Ash Pits, June 12, 2003 (EPA 2003a).

BZCR ID	Description	Action Taken	Final Disposition and Date
BZCR Site 34 1999	Disturbed Ground SE of the IA and S of Woman Creek (CDPHE 1999)	Inspected area and used RFCA consultative process to discuss and assess findings.	No other investigation required, agreed January 10, 2001 (RCR, 1/10/2001, CDPHE 2001).
BZCR Site 35 1999	Disturbed Ground and Debris E of the IA (CDPHE 1999)	Sampling was performed under an Integrated Work Control Program (IWCP) for Routine BZ Cleanup Activities. Maps given to D. Kruchek (CDPHE) 9/22/04. *Note: the May 3, 2001 responses indicate characterization will be with IHSS 216.2 (EPA 2003b).* Site sampled and all results less than RFCA ALs (DOE 2001, DOE 2004e).	Documented completion of sampling and analysis with CDPHE September 22, 2004. NFAA approved for IHSS 216.2, October 7, 2003 (EPA 2003b).[20]
BZCR Site 36 1999	Disturbed Ground W of the IA. Appears to be Fill Material (CDPHE 1999)	The Site is within PAC 100-604 and was addressed in the NFAA for PAC 100-604.	NFAA approved by CDPHE and EPA February 14, 2002 (CDPHE and EPA 2002).
BZCR Site 1(a) 2003	Additional Investigation Required in the Area W of the IA. Disturbance Identified on Aerial Photographs (CDPHE 2003b)	Borehole samples were collected at three locations on February 3, 2004 and results provided to the Regulatory Agencies on April 8, 2004 (DOE 2004d).	No other investigation required. Approval Letter from CDPHE and EPA dated May 11, 2004 (CDPHE and EPA 2004).
BZCR Site 2(a) 2003	Additional Investigation Required in the Area N of the IA. Aerial Photograph Dated September 25, 1975 shows Unknown Cylindrical Objects (CDPHE 2003b)	Research was conducted and explanations provided in response titled "Additional Assessment to BZCR" April 8, 2004 (DOE 2004d).	No other investigation required. Approval Letter from CDPHE and EPA dated May 11, 2004 (CDPHE and EPA 2004).
BZCR Site 3(a) 2003	Additional Investigation Required in the Area Immediately W of the Present Landfill. Aerial Photograph Dated July 29, 1983 shows Dam-like Feature (CDPHE 2003b)	Research was conducted and explanations provided in response titled "Additional Assessment to BZCR" April 8, 2004 (DOE 2004d).	No other investigation required. Approval Letter from CDPHE and EPA dated May 11, 2004. (CDPHE and EPA 2004).
BZCR Site 4(a) 2003	Additional Investigation Required in the Area Near IHSSs 166.1, 166.2 and 166.3 Immediately S of the Present Landfill (CDPHE 2003b)	Research was conducted and explanations provided in response titled "Additional Assessment to BZCR" April 8, 2004 (DOE 2004d).	No other investigation required. Approval Letter from CDPHE and EPA dated May 11, 2004 (CDPHE and EPA 2004).
BZCR Site 5(a) 2003	Additional Investigation Required in the Area N of the Present Landfill as shown in Aerial Photograph dated June 26, 1991 (CDPHE 2003b)	Research was conducted and explanations provided in response titled "Additional Assessment to BZCR" April 8, 2004 (DOE 2004d).	No other investigation required. Approval Letter from CDPHE and EPA dated May 11, 2004. (CDPHE and EPA 2004).

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INDEX

881 Hillside..... 666, 669, 670, 941
903 Pad... 140, 143, 214, 379, 571, 739, 744, 771, 793, 938, 941
904 Pad..... 601, 1008, 1034
acid. 143, 183, 219, 237, 266, 292, 301, 330, 339, 357, 365, 366, 368, 414, 417, 483, 487, 490, 513, 542, 550, 559, 562, 702, 850, 871, 885, 916, 927, 950, 976, 984
aluminum . 38, 169, 175, 205, 414, 417, 430, 477, 676, 809, 865, 913, 920
americium 20, 25, 26, 32, 33, 34, 39, 43, 50, 60, 63, 66, 68, 69, 72, 103, 140, 141, 163, 169, 185, 191, 197, 199, 219, 220, 228, 273, 274, 278, 288, 290, 340, 368, 415, 418, 421, 424, 425, 432, 464, 467, 476, 483, 508, 525, 531, 557, 560, 567, 571, 590, 594, 603, 606, 737, 754, 842, 848, 851, 853, 858, 872, 875, 876, 879, 885, 888, 890, 895, 898, 899, 907, 910, 914, 921, 938, 940, 1032
arsenic 10, 20, 32, 33, 38, 113, 154, 164, 186, 191, 212, 232, 353, 368, 418, 428, 473, 477, 528, 536, 537, 565, 567, 568, 572, 609, 632, 709, 769, 793, 839, 853, 858, 882, 910, 914, 933
asbestos .. 107, 108, 128, 170, 211, 260, 343, 664
A-Series Drainage..... 43, 59, 184
A-Series Ponds..... 42, 939
beryllium.. 69, 157, 164, 186, 219, 232, 333, 336, 352, 372, 396, 417, 421, 464, 467, 510, 562, 674, 676, 687, 690, 727, 842, 863, 865, 913, 914, 920, 932, 939, 940
Bowman's Pond..... 43, 564, 631, 632, 633
B-Series Drainage..... 48, 49, 59, 85
B-Series Ponds..... 48, 510, 792, 939, 940
Buffer Zone.... 18, 24, 30, 37, 42, 48, 55, 59, 62, 65, 68, 71, 74, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 98, 100, 102, 107, 113, 116, 119, 121, 123, 126, 128, 130, 132, 134, 136, 139, 147, 149, 151, 153, 167, 179, 214, 731, 735, 739, 760, 766, 769, 771, 786, 813, 831
Building 111..... 251
Building 115..... 247
Building 116..... 209
Building 119..... 264
Building 121..... 257
Building 122..... 838
Building 123... 189, 220, 231, 237, 239, 242, 260, 262, 269, 339, 841
Building 124..... 139, 175, 235
Building 125..... 249, 845
Building 130..... 266
Building 131..... 255
Building 219..... 167
Building 223..... 456
Building 228A..... 795
Building 228B..... 795
Building 231..... 454
Building 331... 272, 274, 305, 320, 326, 847, 982
Building 334.... 281, 286, 318, 487, 560, 990
Building 335..... 283, 284
Building 367..... 303, 501
Building 371... 214, 227, 281, 296, 301, 315, 456, 501, 849, 850
Building 373..... 277, 322, 324
Building 374... 205, 217, 219, 242, 301, 309, 311, 328, 562, 601, 602, 611, 645, 852, 1032
Building 381..... 307
Building 439..... 351, 855
Building 440..... 388, 857
Building 441..... 339, 860
Building 442..... 348, 392, 863
Building 443..... 205, 399, 966
Building 444. 19, 21, 25, 31, 37, 71, 75, 168, 269, 273, 274, 298, 336, 345, 351, 352, 355, 396, 407, 462, 472, 487, 562, 732, 744, 865, 939, 1058
Building 446..... 382
Building 447... 168, 333, 351, 352, 363, 376, 377, 868, 972
Building 452..... 469
Building 453..... 333, 355
Building 460..... 365, 401, 404, 409
Building 528..... 423, 425, 871
Building 551..... 414, 420, 430, 458, 962
Building 552..... 430
Building 553..... 420
Building 554..... 326
Building 559.... 414, 423, 440, 451, 871, 874

Building 561..... 451
Building 566..... 434
Building 569..... 197, 415
Building 662..... 484, 487
Building 663..... 487, 490
Building 664..... 467, 476
Building 666..... 492
Building 667..... 501
Building 668..... 464
Building 701..... 557, 654, 878
Building 702..... 535
Building 703..... 535
Building 707..... 49, 281, 508, 513, 597, 599, 618, 881, 883, 958
Building 708..... 207, 621, 649
Building 712..... 535
Building 713..... 535
Building 714..... 550
Building 728..... 521, 522
Building 729..... 954
Building 730..... 530, 556
Building 731..... 885
Building 732..... 611
Building 750..... 639, 950
Building 762A..... 627
Building 765..... 647
Building 770..... 570, 572, 632, 887
Building 771. 42, 43, 65, 184, 191, 196, 209, 228, 479, 482, 550, 552, 554, 561, 570, 574, 606, 637, 744, 890, 891, 938, 978
Building 774..... 42, 65, 140, 149, 184, 201, 202, 281, 516, 517, 524, 545, 547, 559, 564, 571, 606, 631, 647, 739, 745, 757, 891, 894, 1058
Building 776... 298, 461, 472, 479, 504, 527, 530, 577, 583, 590, 608, 629, 635, 651, 654, 744, 891, 897, 898, 902, 904, 938, 952, 956, 980
Building 777... 461, 472, 562, 590, 897, 898, 904, 932, 952
Building 778..... 530, 611, 635, 906
Building 779.... 539, 587, 624, 635, 909, 911
Building 781..... 952
Building 785..... 539
Building 788..... 184, 602
Building 850..... 501
Building 865..... 687, 700, 913
Building 866..... 706, 707, 727
Building 869..... 744
Building 881... 139, 140, 147, 149, 151, 196, 209, 269, 273, 274, 298, 462, 479, 501, 560, 562, 660, 662, 664, 666, 669, 672, 674, 685, 693, 695, 709, 716, 757, 916, 917
Building 883... 298, 482, 690, 700, 702, 711, 725, 744, 920, 921
Building 884..... 679
Building 885..... 682
Building 886..... 676, 924, 970
Building 887..... 672, 927
Building 889..... 679, 700, 706, 929, 984
Building 891..... 506
Building 910..... 95, 795
Building 920..... 83
Building 952..... 786
Building 964..... 784
Building 980..... 782, 790
Building 990..... 210
Building 991... 163, 510, 780, 788, 797, 932, 972
Building 995..... 49, 62, 108, 204, 209, 210, 524, 795
BZ ..... *See* Buffer Zone
carbon tetrachloride ... 19, 20, 26, 39, 91, 93, 157, 201, 415, 424, 451, 504, 506, 508, 530, 532, 554, 557, 736, 739, 740, 813, 823, 835, 962, 980
caustic 49, 158, 204, 205, 336, 542, 547, 550, 559, 850, 894, 895
Central Avenue 196, 201, 202, 214, 217, 359, 427, 437, 448, 461, 562, 841, 974, 1030
Central Avenue Ditch 204, 412, 498, 704, 745, 972
chlorine 75, 175, 655
chromate..... 277, 345, 536, 972, 973
chromic acid..... 49, 71, 75, 803, 939
chromium 33, 49, 60, 63, 71, 75, 89, 91, 157, 164, 212, 311, 345, 352, 368, 371, 401, 417, 420, 467, 482, 522, 528, 536, 539, 557, 560, 609, 677, 764, 831, 963, 1000, 1002
closure.. 46, 53, 57, 110, 114, 145, 159, 176, 185, 186, 210, 211, 212, 220, 227, 333, 371,

410, 444, 517, 522, 539, 548, 550, 602, 693, 696, 842, 885, 891
condensate.. 42, 49, 139, 140, 149, 151, 361, 514, 545, 547, 599, 631, 632, 647, 709
container... 21, 108, 116, 119, 123, 132, 237, 286, 352, 371, 571, 602, 711, 777, 778, 790, 792, 803, 887, 894, 913, 916, 932
contaminated soil . 26, 32, 33, 49, 68, 85, 87, 123, 130, 169, 202, 220, 337, 340, 343, 348, 357, 394, 422, 423, 438, 441, 454, 458, 485, 488, 505, 508, 525, 527, 531, 532, 542, 552, 557, 560, 562, 568, 571, 577, 580, 587, 590, 609, 615, 619, 621, 625, 640, 647, 669, 679, 714, 736, 740, 745, 746, 754, 757, 766, 771, 774, 778, 863, 871, 879, 898, 900, 903, 904, 910, 911, 1002, 1024, 1060
Contingency Plan Implementation Report49, 71, 83, 96, 130, 132, 133, 134, 143, 236, 242, 262, 289, 301, 311, 320, 322, 324, 325, 327, 329, 394, 443, 451, 455, 456, 458, 697, 814, 835, 850, 927
cooling tower ... 42, 151, 209, 277, 345, 535, 536, 539
corrosion 355, 504, 777, 801
CPIR. *See* Contingency Plan Implementation Report
criticality 897, 902, 924
C-Series Drainage 140, 143
cyanide 183, 368, 371, 603, 695, 731, 732
dock 151, 249, 252, 301, 333, 336, 348, 351, 401, 420, 570, 571, 577, 587, 597, 624, 709, 780, 850, 874, 897, 933
east gate..... 81, 292, 731
East Spray Field 49, 71, 74, 75, 143
effluent . 71, 74, 75, 140, 175, 183, 184, 189, 204, 210, 277, 536, 539, 564, 567, 606, 608, 666, 672, 788, 819, 894
ethylene glycol . 49, 207, 240, 324, 339, 513, 954, 966, 986, 1016, 1040, 1048
explosion 527, 574, 608, 809, 897
FIDLER..... 60, 147, 564, 706
fire .. 305, 307, 336, 352, 363, 396, 397, 527, 570, 574, 577, 583, 590, 608, 637, 654, 679, 700, 711, 891, 897, 902
Firing Range..... 136, 153, 154
Flume Pond 55
footing drain. 42, 49, 65, 143, 151, 158, 184, 214, 226, 228, 252, 451, 559, 561, 564, 631, 669
Freon 114, 119, 407, 845
glovebox. 637, 850, 852, 881, 891, 897, 898, 902, 913
graphite 158, 487, 865, 890, 916
Great Western Reservoir..... 937, 939, 940
groundwater . 20, 26, 39, 43, 56, 91, 93, 108, 120, 126, 159, 163, 169, 184, 333, 423, 506, 521, 532, 539, 554, 562, 599, 603, 615, 669, 670, 727, 736, 737, 740, 745, 746, 747, 749, 750, 766, 816, 838, 842, 845, 847, 850, 852, 855, 857, 866, 868, 871, 875, 878, 882, 885, 887, 891, 895, 900, 909, 914, 917, 920, 921, 925, 927, 929, 933, 938, 940
HEPA filter 570, 863, 891
hydrofluoric acid..... 143, 220, 365, 371, 550
hydrogen peroxide .. 359, 427, 428, 838, 839
IA .....*See* Industrial Area
IHSS 199 ..... 937, 938, 939
IHSS 200 ..... 937, 938, 939, 940
IHSS 201 ..... 937, 941
IHSS 202 ..... 937, 942
incinerator 107, 167, 168, 170, 173, 849, 897, 902
Indiana Street 140, 938
Industrial Area 157, 175, 183, 189, 196, 201, 204, 207, 209, 216, 217, 219, 226, 231, 235, 237, 239, 242, 245, 247, 249, 251, 255, 257, 260, 262, 264, 266, 269, 272, 283, 288, 292, 294, 298, 301, 303, 305, 307, 309, 311, 313, 315, 318, 320, 322, 324, 326, 328, 330, 333, 336, 339, 342, 345, 348, 351, 355, 357, 359, 361, 363, 365, 368, 371, 374, 376, 379, 382, 384, 386, 388, 390, 392, 394, 396, 399, 401, 404, 407, 409, 412, 414, 417, 420, 423, 427, 430, 434, 437, 440, 443, 445, 448, 451
ion exchange 887, 891
irrigation..... 74, 79, 939, 941, 942
landfill 65, 107, 109, 130, 158, 159, 183
landfill pond 65, 66, 68
lathe coolant 19, 21, 25, 31, 37, 103, 114, 119
lead... 20, 33, 38, 60, 69, 132, 136, 153, 154, 164, 169, 266, 330, 340, 368, 407, 415, 417,

420, 462, 470, 473, 505, 522, 532, 557, 677, 764, 842, 860, 866, 917, 1000, 1002, 1022
lithium 272, 274, 322, 345, 352, 465, 531, 677, 760, 917
McKay Ditch..... 55, 56, 939
mercury 33, 60, 147, 169, 235, 482, 764, 846
mound 744, 745, 747, 797, 941
Mower Reservoir 937, 942
nickel carbonyl..... 121, 637, 760, 1038
nitrate ... 43, 66, 68, 140, 183, 184, 185, 199, 219, 227, 232, 240, 311, 417, 513, 517, 524, 562, 571, 580, 594, 631, 749, 852, 940
nitric acid 143, 220, 239, 292, 336, 365, 366, 371, 482, 510, 697, 850, 871, 891, 920
North Walnut Creek..... 42, 43, 68, 184, 536, 545, 552, 559, 560, 631
North Walnut Creek Drainage 42, 228
NPDES..... 49, 74, 452, 939, 941
NPWL 219, 220, 221, 343, 697, 698, 839, 841, 853, 922, 1044, 1064
oil 19, 25, 31, 37, 81, 108, 116, 119, 123, 132, 157, 179, 201, 214, 219, 247, 251, 255, 269, 279, 283, 286, 305, 318, 333, 342, 352, 355, 363, 379, 392, 394, 399, 407, 417, 434, 437, 440, 445, 456, 461, 469, 476, 484, 487, 490, 492, 498, 510, 513, 530, 587, 609, 614, 618, 621, 629, 647, 651, 658, 669, 682, 690, 713, 719, 725, 739, 749, 754, 766, 769, 782, 790, 807, 833, 879, 894, 946, 956, 958, 960, 968, 970, 988, 996, 1000, 1004, 1006, 1008, 1020, 1022, 1024, 1026, 1030, 1050, 1058
Operable Unit 1..... 658, 660, 662, 664, 666, 669, 672, 749, 754, 757, 941
Operable Unit 10.... 113, 116, 119, 286, 294, 342, 355, 365, 368, 371, 601, 682, 782, 790, 792
Operable Unit 11..... 199
Operable Unit 12.... 333, 336, 345, 351, 357, 464, 467, 482, 674
Operable Unit 13.... 204, 231, 269, 272, 273, 275, 283, 288, 348, 359, 414, 417, 420, 427, 430, 461, 469
Operable Unit 14.... 196, 281, 282, 472, 476, 479, 527, 679
Operable Unit 15.... 296, 363, 685, 687, 690, 693, 695
Operable Unit 16.... 121, 207, 361, 431, 597, 599
Operable Unit 2.... 18, 24, 30, 37, 74, 87, 91, 93, 98, 100, 102, 731, 735, 739, 744, 760, 766, 769, 771, 786, 813, 822, 825, 941
Operable Unit 3..... 937, 943
Operable Unit 4..... 183
Operable Unit 5..... 139, 143, 147, 157, 162, 163, 167, 173, 175
Operable Unit 6.... 42, 48, 55, 59, 62, 65, 71, 85, 552, 763, 777, 940
Operable Unit 7..... 68, 107, 123
Operable Unit 8..... 201, 277, 279, 280, 292, 504, 508, 510, 511, 531, 535, 539, 542, 545, 547, 550, 556, 557, 570, 574, 577, 580, 583, 585, 587, 590, 592, 594, 780, 788
Operable Unit 9..... 189, 339, 423, 504, 513, 516, 520, 521, 524, 530, 562, 564, 567
OPWL 43, 50, 189, 190, 219, 228, 339, 513, 516, 524, 556, 560, 562, 567, 568, 677, 679, 839, 841, 860, 868, 871, 875, 882, 883, 885, 895, 909, 911, 917, 921, 922, 927, 930, 1044, 1064
Original Landfill 157, 158, 159, 175, 176
OU..... *See* Operable Unit
outfall . 49, 65, 158, 552, 554, 561, 631, 632, 666
PAC 000-101 183
PAC 000-121 189
PAC 000-162 196
PAC 000-168 199
PAC 000-172 201
PAC 000-190 204
PAC 000-192 207
PAC 000-500 209
PAC 000-501 214
PAC 000-503 217
PAC 000-504 219
PAC 000-505 226
PAC 100-148 231
PAC 100-600 235
PAC 100-601 237
PAC 100-602 239
PAC 100-603 242
PAC 100-604 245
PAC 100-605 247

PAC 100-606 249
PAC 100-607 251
PAC 100-608 255
PAC 100-609 257
PAC 100-610 260
PAC 100-611 262
PAC 100-612 264
PAC 100-613 266
PAC 1601.1 151
PAC 1601.2 151
PAC 300-128 269
PAC 300-134N 272
PAC 300-134S 272
PAC 300-135 277
PAC 300-151 279
PAC 300-156.1 281
PAC 300-171 283
PAC 300-181 286
PAC 300-186 288
PAC 300-188 292
PAC 300-206 294
PAC 300-212 296
PAC 300-700 298
PAC 300-701 301
PAC 300-702 303
PAC 300-703 305
PAC 300-704 307
PAC 300-705 309
PAC 300-706 311
PAC 300-707 313
PAC 300-708 315
PAC 300-709 318
PAC 300-710 320
PAC 300-711 322
PAC 300-712 324
PAC 300-713 326
PAC 300-714 328
PAC 300-715 330
PAC 400-116.1 333
PAC 400-116.2 336
PAC 400-122 339
PAC 400-136.1 345
PAC 400-136.2 345
PAC 400-157.2 351
PAC 400-182 355
PAC 400-187 357
PAC 400-191 359
PAC 400-193 361
PAC 400-204 363
PAC 400-205 365
PAC 400-207 368
PAC 400-208 371
PAC 400-800 374
PAC 400-801 376
PAC 400-802 379
PAC 400-803 382
PAC 400-804 384
PAC 400-805 386
PAC 400-806 388
PAC 400-807 390
PAC 400-808 392
PAC 400-809 394
PAC 400-810 396
PAC 400-811 399
PAC 400-812 401
PAC 400-813 404
PAC 400-814 407
PAC 400-815 409
PAC 400-820 412
PAC 500-117.1 414
PAC 500-117.2 417
PAC 500-158 420
PAC 500-159 423
PAC 500-169 427
PAC 500-197 430
PAC 500-900 434
PAC 500-901 437
PAC 500-902 440
PAC 500-903 443
PAC 500-904 445
PAC 500-905 448
PAC 500-906 451
PAC 500-907 454
PAC 500-908 456
PAC 500-909 458
PAC 600-1000 484
PAC 600-1001 487
PAC 600-1001(A) 490
PAC 600-1002 492
PAC 600-1003 495
PAC 600-1004 498
PAC 600-1005 501

PAC 600-117.3 461
PAC 600-120.1 464
PAC 600-120.2 467
PAC 600-152 469
PAC 600-160 472
PAC 600-161 476
PAC 600-164.1 479
PAC 600-189 482
PAC 700-1100 608
PAC 700-1101 611
PAC 700-1102 614
PAC 700-1103 618
PAC 700-1104 621
PAC 700-1105 624
PAC 700-1106 627
PAC 700-1107 629
PAC 700-1108 631
PAC 700-1109 635
PAC 700-1110 637
PAC 700-1111 639
PAC 700-1112 642
PAC 700-1113 645
PAC 700-1114a..... 647
PAC 700-1114b 647
PAC 700-1115 649
PAC 700-1116 651
PAC 700-1117 654
PAC 700-118.1 504
PAC 700-118.2 508
PAC 700-123.1 510
PAC 700-123.2 513
PAC 700-124.1 516
PAC 700-124.2 516
PAC 700-124.3 516
PAC 700-125 520
PAC 700-126.1 521
PAC 700-126.2 521
PAC 700-127 524
PAC 700-131 527
PAC 700-132 530
PAC 700-137 535
PAC 700-138 539
PAC 700-139.1(S)..... 542
PAC 700-143 552
PAC 700-144(N)..... 556
PAC 700-144(S)..... 556
PAC 700-146.1 559
PAC 700-146.2 559
PAC 700-146.3 559
PAC 700-146.4 559
PAC 700-146.5 559
PAC 700-146.6 559
PAC 700-147.1 562
PAC 700-149.1 564
PAC 700-149.2 567
PAC 700-150.1 570
PAC 700-150.2(N)..... 574
PAC 700-150.2(S)..... 577
PAC 700-150.3 580
PAC 700-150.4 583
PAC 700-150.5 585
PAC 700-150.6 587
PAC 700-150.7 590
PAC 700-150.8 587
PAC 700-163.1 592
PAC 700-163.2 594
PAC 700-185 597
PAC 700-194 599
PAC 700-214 601
PAC 700-215 606
PAC 800-102 658
PAC 800-103 660
PAC 800-104 662
PAC 800-105.1 664
PAC 800-105.2 664
PAC 800-106 666
PAC 800-107 669
PAC 800-1200 ..... 697, 698
PAC 800-1201 700
PAC 800-1202 702
PAC 800-1203 704
PAC 800-1204 706
PAC 800-1205 709
PAC 800-1206 711
PAC 800-1207 713
PAC 800-1208 716
PAC 800-1209 719
PAC 800-1210 722
PAC 800-1211 725
PAC 800-1212 727
PAC 800-145 672
PAC 800-147.2 674

PAC 800-164.2 676
PAC 800-164.3 679
PAC 800-177 682
PAC 800-178 685
PAC 800-179 687
PAC 800-180 690
PAC 800-211 693
PAC 800-217 695
PAC 900-108 731
PAC 900-109 735
PAC 900-112 739
PAC 900-113 744
PAC 900-119.1 749
PAC 900-119.2 754
PAC 900-130 757
PAC 900-1301 797
PAC 900-1302 799
PAC 900-1303 801
PAC 900-1304 803
PAC 900-1305 805
PAC 900-1306 807
PAC 900-1307 809
PAC 900-1308 811
PAC 900-1309 813
PAC 900-1310 816
PAC 900-1311 819
PAC 900-1312 822
PAC 900-1313 825
PAC 900-1314 827
PAC 900-1315 829
PAC 900-1316 831
PAC 900-1317 833
PAC 900-1318 835
PAC 900-140 760
PAC 900-141 763
PAC 900-153 766
PAC 900-154 769
PAC 900-155 771
PAC 900-165 777
PAC 900-173 780
PAC 900-175 782
PAC 900-176 784
PAC 900-183 786
PAC 900-184 788
PAC 900-210 790
PAC 900-213 792
PAC NE-110 ..... 18, 22
PAC NE-111.1 24
PAC NE-111.2 30
PAC NE-111.3 30
PAC NE-111.4 37
PAC NE-111.5 30
PAC NE-111.6a 30
PAC NE-111.6b 30
PAC NE-111.7 30
PAC NE-111.8 30
PAC NE-1400 77
PAC NE-1401 79
PAC NE-1402 81
PAC NE-1403 83
PAC NE-1404 85
PAC NE-1405 87
PAC NE-1406 89
PAC NE-1407 91
PAC NE-1408 93
PAC NE-1409 95
PAC NE-1410 98
PAC NE-1411 100
PAC NE-1412 102
PAC NE-1413 102
PAC NE-142.1 42
PAC NE-142.12 55
PAC NE-142.2 42
PAC NE-142.3 42
PAC NE-142.4 42
PAC NE-142.5 ..... 48, 552
PAC NE-142.7 48
PAC NE-142.8 48
PAC NE-142.9 48
PAC NE-156.2 59
PAC NE-166.1 62
PAC NE-166.2 62
PAC NE-166.3 62
PAC NE-167.1 65
PAC NE-167.2 68
PAC NE-167.3 68
PAC NE-216.1 71
PAC NE-216.2 74
PAC NE-216.3 74
PAC NW-114 107
PAC NW-1500 126
PAC NW-1501 128

PAC NW-1502 130
PAC NW-1503 132
PAC NW-1504 134
PAC NW-1505 136
PAC NW-170 113
PAC NW-174a 116
PAC NW-174b 119
PAC NW-195 121
PAC NW-203 123
PAC Off-Site Area 1 937
PAC Off-Site Area 2 937
PAC Off-Site Area 3 937
PAC Off-Site Area 4 937
PAC SE-142.10 139
PAC SE-142.11 143
PAC SE-1600 ..... 149, 150
PAC SE-1601 151
PAC SE-1601.1 151
PAC SE-1602 153
PAC SE-209 147
PAC SW-115 157
PAC SW-133.1 162
PAC SW-133.2 162
PAC SW-133.3 162
PAC SW-133.4 162
PAC SW-133.5 167
PAC SW-133.6 173
PAC SW-1700 ..... 140, 179
PAC SW-1701 162
PAC SW-1702 162
PAC SW-196 175
paint thinner 116, 157, 508, 790
PCB ..... *See* polychlorinated biphenyl (PCB)
PCE ..... *See* perchloroethylene (PCE)
perchloroethylene (PCE) 120, 530, 739, 745, 746, 750, 766
perclene 201, 336, 487, 490
pesticide 157, 303, 340, 501, 871
plenum.... 283, 352, 396, 397, 521, 570, 574, 637, 891, 922
plutonium . 18, 20, 21, 24, 25, 26, 30, 32, 33, 34, 37, 39, 49, 50, 51, 60, 63, 66, 68, 69, 72, 103, 108, 140, 169, 185, 191, 197, 199, 201, 219, 220, 273, 274, 278, 288, 289, 333, 340, 417, 421, 424, 425, 431, 462, 464, 467, 470, 472, 473, 476, 479, 483, 488, 492, 495, 513, 517, 522, 524, 525, 527, 531, 552, 557, 559, 562, 568, 571, 574, 577, 578, 580, 594, 603, 606, 608, 631, 669, 677, 700, 737, 739, 754, 757, 764, 771, 774, 778, 793, 843, 848, 849, 850, 851, 853, 858, 872, 874, 875, 876, 879, 881, 885, 890, 891, 895, 897, 898, 899, 902, 903, 906, 907, 909, 910, 914, 921, 924, 932, 938, 940, 942
polychlorinated biphenyl (PCB) 81, 107, 108, 123, 219, 251, 257, 315, 339, 340, 374, 376, 399, 434, 440, 446, 448, 484, 495, 614, 618, 621, 624, 625, 632, 639, 640, 642, 647, 713, 714, 716, 719, 767, 869, 871, 911, 1026
pond.... 49, 56, 175, 199, 272, 277, 345, 631, 645, 666, 819, 900, 904
Pond 2 ..... 183, 911
Pond 207-A 627
Pond 207-C 524
Pond 2C 183
Pond 2D 183
Pond 6 ..... 139, 151, 175
Pond 7 ..... 139, 149, 150, 151
Pond 8 ..... 139, 151
Pond 9 139
Pond A 602
Pond A-1 ..... 42, 43, 44
Pond A-2 ..... 42, 44, 49, 204
Pond A-3 ..... 42, 45, 228, 396, 560
Pond A-4 ..... 42, 43, 45, 144, 227, 228, 560
Pond A-5 ..... 42, 55
Pond B 602
Pond B-1 ..... 48, 49, 50, 204, 205, 207, 510, 552, 599
Pond B-2 ..... 48, 49, 50, 85, 204, 205
Pond B-3 ... 48, 51, 71, 74, 75, 204, 210, 396
Pond B-4 ..... 48, 49, 51, 599
Pond B-5 ..... 48, 49, 52, 144
Pond C 602
Pond C-1 ..... 139, 140, 143, 214, 396
Pond C-2 ..... 139, 143, 144, 169, 366, 666
pondcrete 184, 601, 603, 792
Present Landfill .. 62, 65, 102, 107, 108, 109, 121, 123, 130, 132, 134, 157, 168, 173, 257, 298, 414, 431, 469, 484, 629, 669, 702, 745, 784, 786

process waste . 189, 205, 209, 210, 220, 231, 239, 240, 288, 289, 339, 368, 401, 409, 423, 424, 513, 521, 522, 524, 530, 556, 559, 562, 564, 580, 601, 627, 631, 645, 695, 697, 706, 707, 786, 829, 852, 871, 875, 878, 885, 894, 927
radiological survey. 169, 218, 333, 476, 527, 539, 557, 574, 578, 587, 592, 685, 693, 695, 700, 749, 788, 855, 897, 921, 922
radionuclides..... 20, 26, 32, 34, 60, 63, 103, 140, 163, 167, 199, 219, 231, 232, 270, 273, 282, 290, 334, 337, 339, 346, 351, 355, 371, 384, 397, 415, 476, 479, 487, 490, 492, 513, 525, 527, 530, 553, 580, 587, 592, 603, 609, 624, 633, 670, 676, 682, 736, 741, 746, 757, 767, 793, 819, 842, 852, 871, 938, 939, 941, 953, 982
reverse osmosis (RO)..... 795
roof drain..... 42, 209, 922
salt..... 215, 311, 697, 852, 881, 890, 920
saltcrete 601, 602, 603, 792
sanitary sewer. 140, 209, 210, 211, 228, 245, 556, 557, 561, 704, 763, 855, 871, 875, 978
sediment..... 43, 48, 49, 50, 51, 55, 141, 163, 164, 556, 601, 633, 869, 900, 904, 921, 938, 939, 940, 942
SEP..... *See* Solar Evaporation Ponds (SEP)
SID.....*See* South Interceptor Ditch (SID)
sludge. 18, 24, 30, 37, 62, 89, 102, 107, 108, 175, 183, 184, 185, 252, 340, 343, 454, 601, 602, 606, 645, 658, 669, 682, 727, 731, 763, 764, 792, 795, 827, 878, 890, 894, 1054
soil..... 19, 20, 25, 31, 43, 50, 51, 55, 74, 75, 100, 119, 126, 136, 157, 159, 162, 163, 164, 167, 333, 348, 349, 351, 353, 386, 399, 401, 404, 409, 473, 476, 479, 488, 496, 498, 501, 504, 506, 513, 531, 536, 542, 550, 552, 564, 568, 571, 577, 578, 608, 614, 618, 624, 631, 632, 633, 640, 645, 647, 649, 679, 714, 793, 811, 816, 827, 830, 833, 835, 838, 842, 845, 847, 850, 852, 855, 857, 866, 868, 871, 875, 878, 882, 885, 887, 891, 895, 897, 900, 904, 910, 914, 917, 920, 925, 927, 929, 933, 938, 948, 1058
Solar Evaporation Ponds (SEP)..... 183, 185, 217, 289, 414, 564, 567, 602, 627, 645, 777, 827, 939, 940
solar pond.....*See* Solar Evaporation Ponds (SEP)
solvent..... 20, 108, 201, 219, 283, 286, 289, 333, 336, 339, 348, 351, 352, 363, 365, 415, 417, 421, 464, 467, 473, 504, 505, 508, 510, 513, 530, 532, 562, 571, 597, 609, 645, 669, 682, 685, 687, 690, 693, 731, 735, 736, 749, 754, 760, 780, 790, 875, 916
South Interceptor Ditch (SID)..... 139, 158
South Walnut Creek... 48, 49, 204, 207, 510, 746, 764, 792, 819, 911
spray field..... 68, 74
Standley Lake..... 937, 940, 941, 942
strontium 20, 38, 60, 63, 66, 68, 72, 110, 514, 522, 531, 553, 560, 677, 764, 797, 810
tank..... 49, 95, 100, 185, 191, 204, 205, 209, 210, 217, 219, 277, 279, 283, 294, 309, 311, 328, 339, 340, 342, 357, 365, 368, 386, 388, 401, 404, 409, 424, 454, 461, 462, 469, 482, 483, 498, 504, 505, 506, 508, 516, 520, 521, 522, 524, 525, 530, 532, 542, 545, 547, 552, 556, 559, 571, 583, 594, 602, 606, 611, 631, 632, 658, 664, 676, 679, 697, 706, 707, 727, 757, 778, 819, 839, 850, 852, 860, 871, 885, 895, 909, 921, 927, 929, 972, 1042, 1044, 1046, 1050, 1064, 1066
TCE..... *See* trichloroethene (TCE)
tear gas 77
transformer81, 123, 251, 255, 315, 318, 374, 376, 399, 430, 434, 437, 440, 445, 448, 449, 484, 492, 495, 614, 615, 618, 619, 621, 624, 632, 639, 642, 651, 713, 716, 719, 722, 807, 1026
trench.. 18, 20, 21, 24, 26, 30, 31, 33, 34, 37, 62, 63, 102, 162, 163, 210, 243, 298, 430, 462, 539, 540, 649, 669, 731, 735, 761, 900, 904, 909, 938, 942
Triangle Area 560, 571, 777, 784
trichloroethane . 34, 126, 157, 296, 392, 647, 736
trichloroethene .... *See* trichloroethene (TCE)

trichloroethene (TCE) 20, 26, 39, 91, 93, 109, 249, 273, 415, 451, 647, 670, 739, 745, 746, 766, 813, 823, 835, 1014
tritium... 20, 66, 68, 108, 109, 141, 199, 277, 294, 368, 599, 603, 707, 874, 940
UBC 122 838
UBC 123 841
UBC 125 845
UBC 331 847
UBC 371 849
UBC 374 852
UBC 439 855
UBC 440 857
UBC 441 ..... 860, 863
UBC 442 863
UBC 444 865
UBC 447 868
UBC 528 871
UBC 559 874
UBC 701 878
UBC 707 881
UBC 731 885
UBC 770 887
UBC 771 890
UBC 774 894
UBC 776 897
UBC 777 902
UBC 778 906
UBC 779 909
UBC 865 913
UBC 881 916
UBC 883 920
UBC 886 924
UBC 887 927
UBC 889 929
UBC 991 932
uranium 18, 19, 20, 21, 24, 26, 30, 32, 34, 37, 38, 63, 103, 108, 109, 140, 141, 153, 158, 163, 167, 168, 169, 176, 185, 197, 201, 202, 212, 219, 220, 274, 288, 290, 333, 334, 336, 337, 345, 351, 352, 355, 363, 368, 372, 379, 384, 397, 414, 420, 421, 464, 465, 467, 470, 476, 477, 483, 510, 513, 517, 522, 559, 560, 562, 583, 603, 609, 612, 627, 635, 674, 677, 679, 680, 683, 690, 697, 700, 706, 707, 731, 732, 737, 739, 749, 754, 797, 810, 843, 847, 848, 849, 851, 853, 856, 857, 858, 860, 863, 865, 866, 868, 869, 872, 874, 876, 879, 885, 888, 892, 895, 907, 913, 914, 916, 917, 920, 921, 924, 927, 932, 933, 940
Valve Vault 1 ..... 222, 698, 922, 974
Valve Vault 11 ..... 220, 288
Valve Vault 12 ..... 220, 288, 289, 627
Valve Vault 124-B 235
Valve Vault 13 ..... 220, 288, 289
Valve Vault 14 290
Valve Vault 17 ..... 239, 240
Valve Vault 18 ..... 233, 239, 240, 842
Valve Vault 19 289
Valve Vault 2 .. 221, 222, 697, 698, 922, 974
Valve Vault 3 ..... 222, 698, 922
Valve Vault 4 930
Valve Vault 6 222
Valve Vault 7 510
Valve Vault 8 221
Valve Vault 9 ..... 221, 611
violation 74, 434
Walnut Creek . 42, 48, 55, 56, 277, 599, 939, 940, 941
West Spray Field..... 184, 199
Wind Site 1036
Windblown..... 772
Woman Creek 74, 91, 139, 140, 143, 157, 158, 167, 175, 179, 666, 669, 737, 941

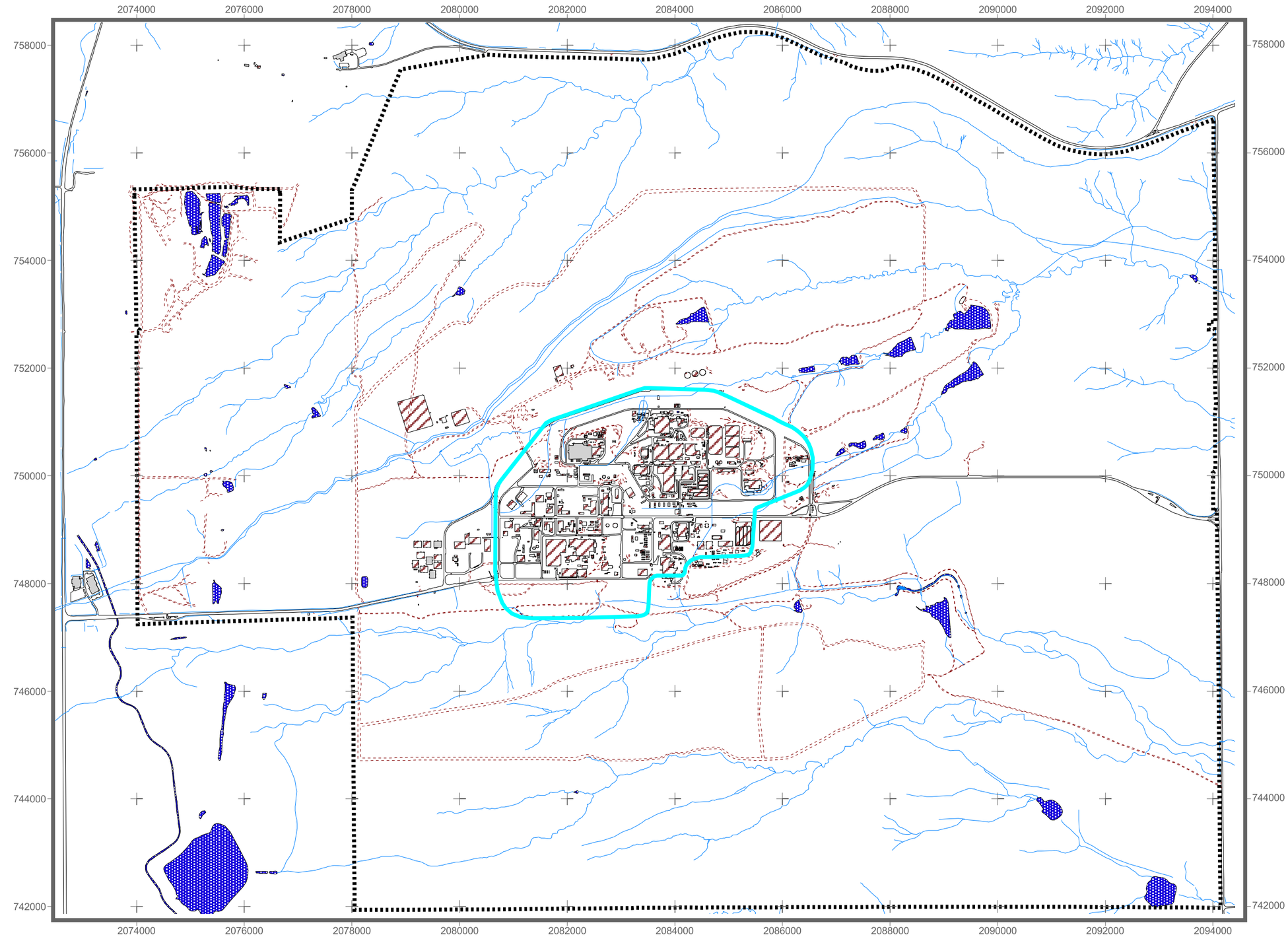

Figure 1
Rocky Flats Environmental Technology Site

KEY

- IA boundary
- Site boundary
- Stream
- Dirt road
- Paved road
- Lake
- Demolished structure
- Structure

N
W E
S

1000 0 1000 Feet

Scale = 1: 22,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.26.2005

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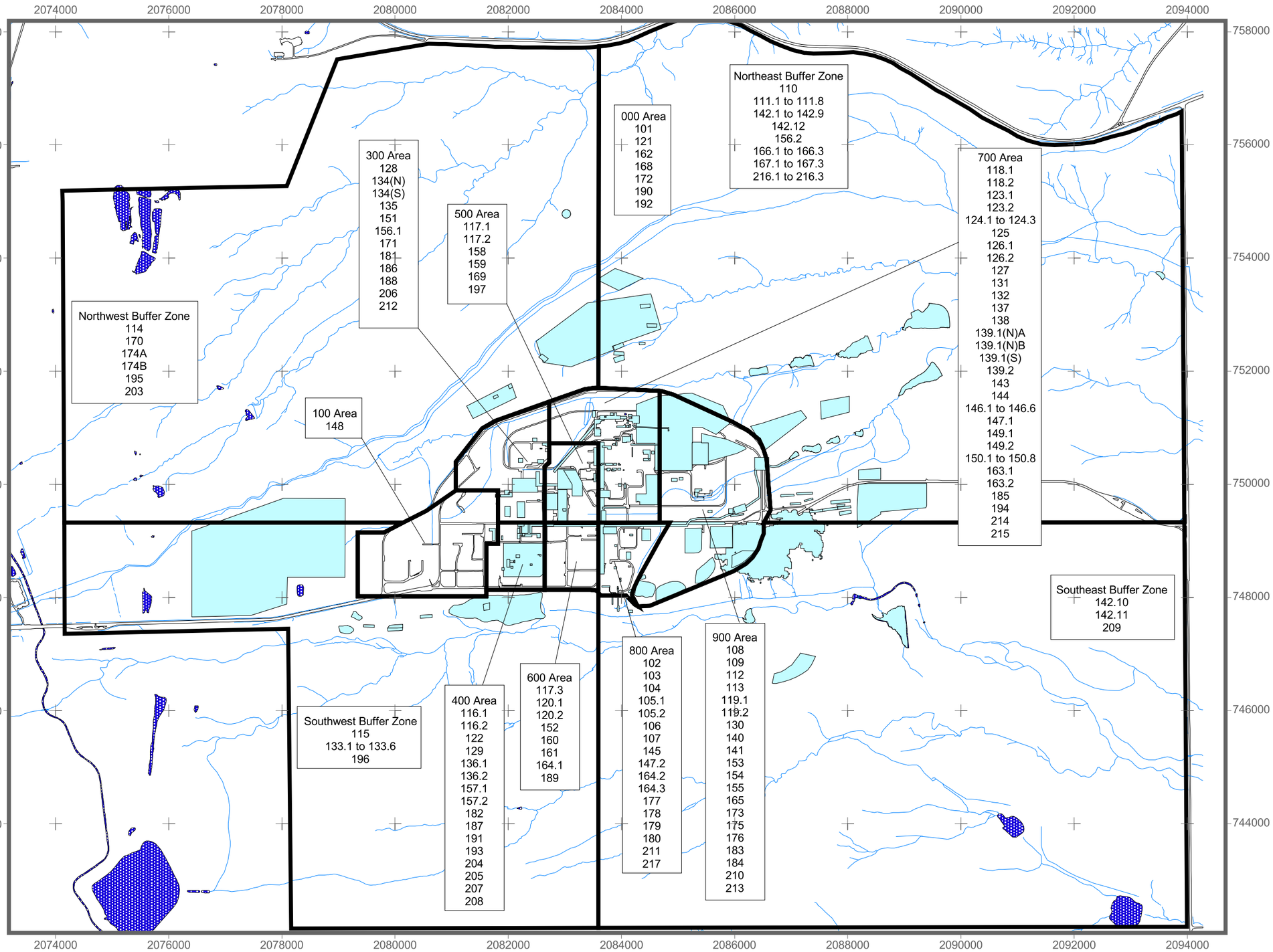

Figure 2
Rocky Flats Environmental Technology Site IHSSs

KEY

- Stream
- Dirt road
- Asphalt
- IHSS
- HRR area boundary
- Lake

N
W E
S

1000 0 1000 2000 Feet

Scale = 1: 21,500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.20.05

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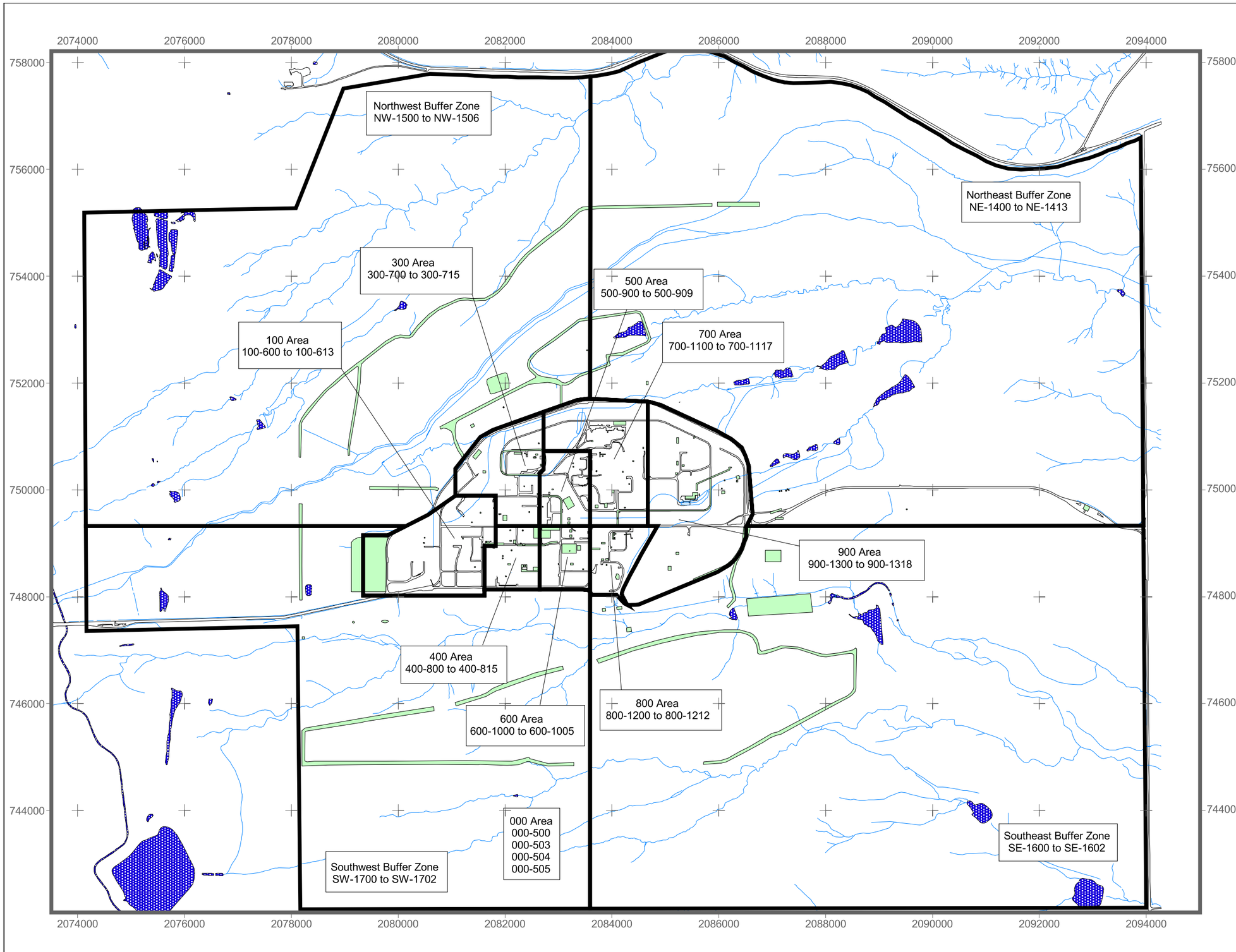

Figure 3
Rocky Flats Environmental Technology Site PACs

KEY

- Stream
- Dirt road
- Asphalt
- PAC
- HRR area boundary
- Lake

N
W E
S

1000 0 1000 2000 Feet

Scale = 1: 21,500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.20.05

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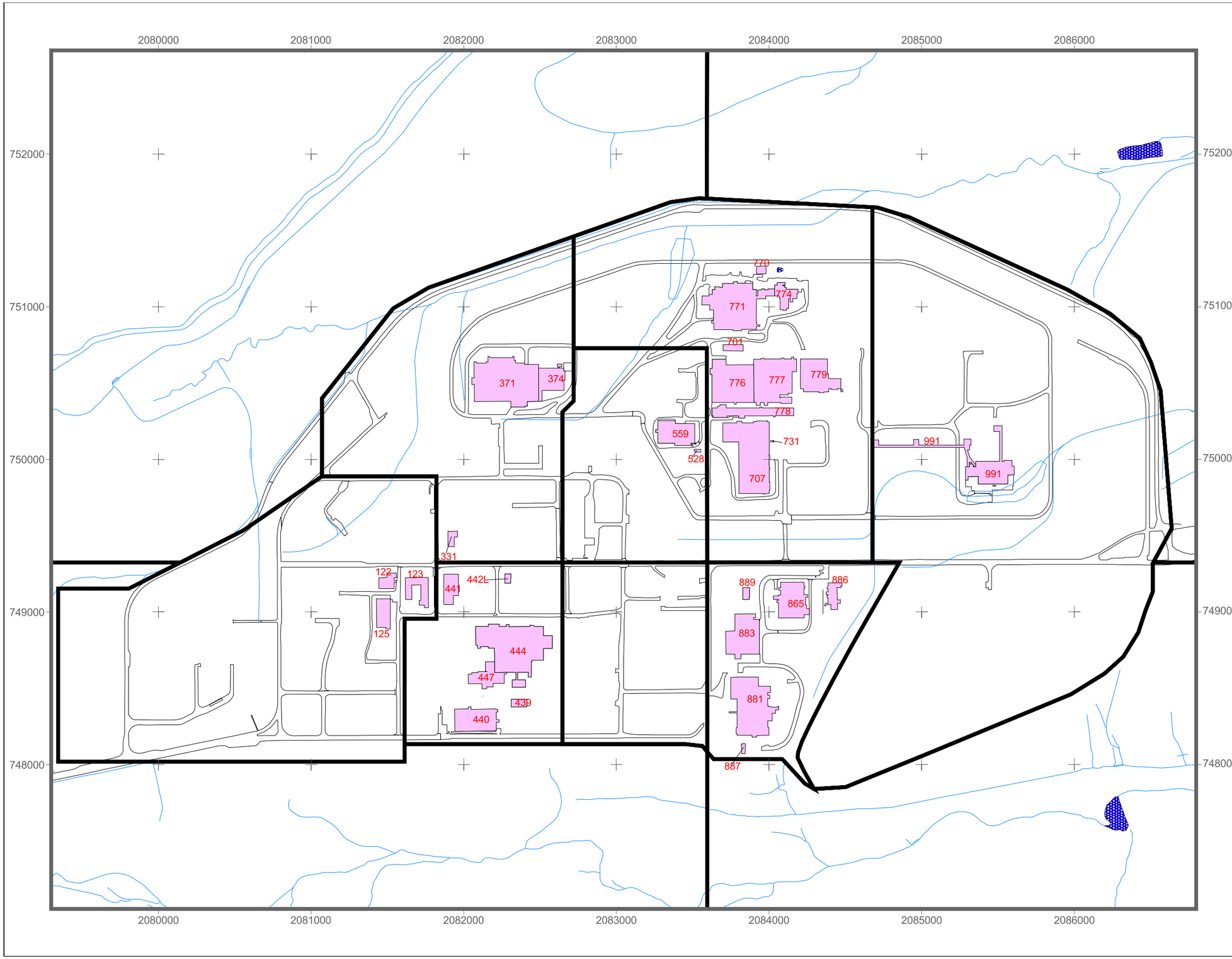

Figure 4
Rocky Flats Environmental Technology Site UBCs

KEY

- Stream
- Dirt road
- Asphalt
- UBC
- HRR area boundary
- Lake

N
W E
S

400 0 400 800 Feet

Scale = 1: 7,500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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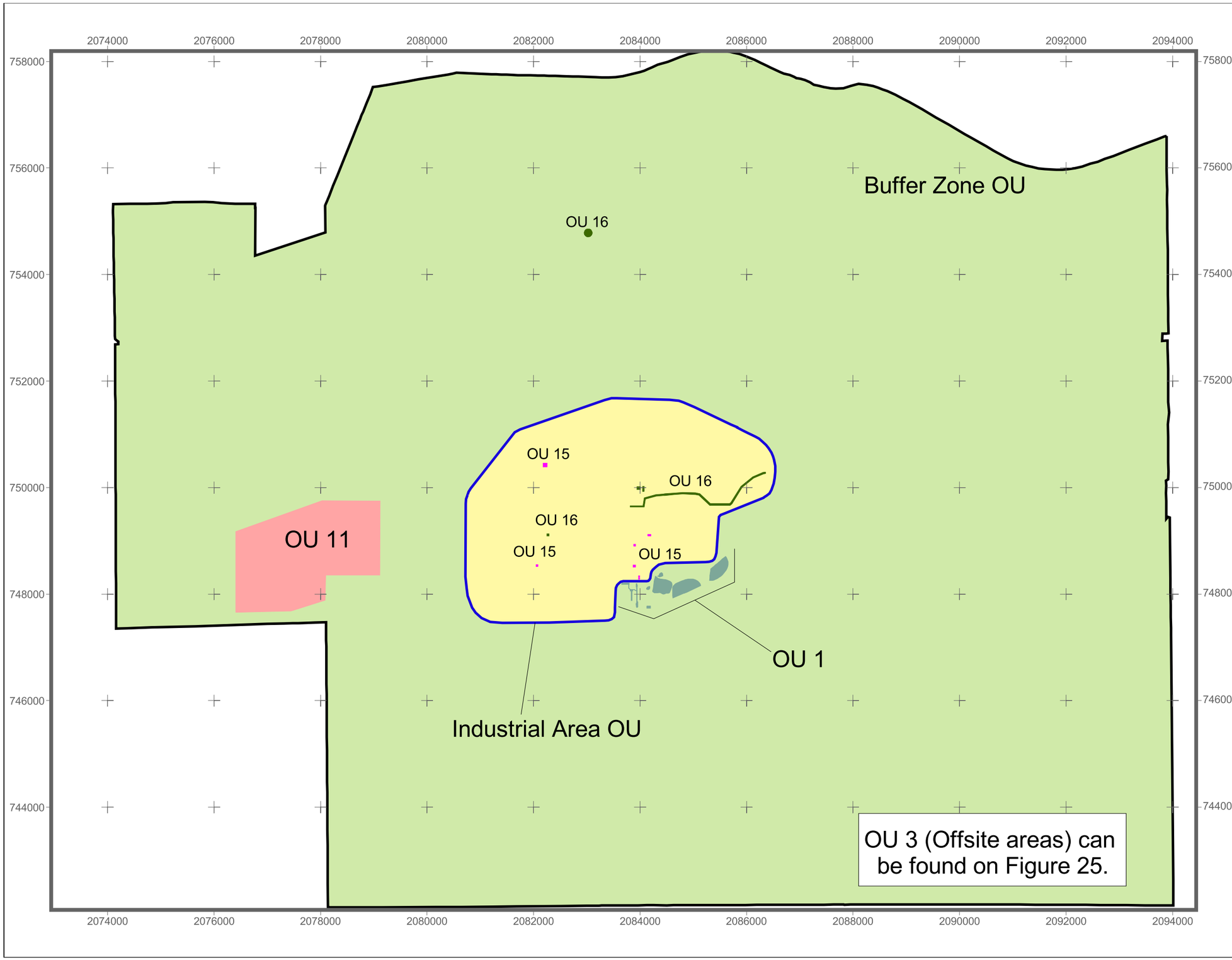

Figure 5
Rocky Flats Environmental Technology Site
Operable Units

KEY

- OU 1
- OU 11
- OU 15
- OU 16
- IA OU
- BZ OU

N
W E
S

1000 0 1000 Feet

Scale = 1: 21,500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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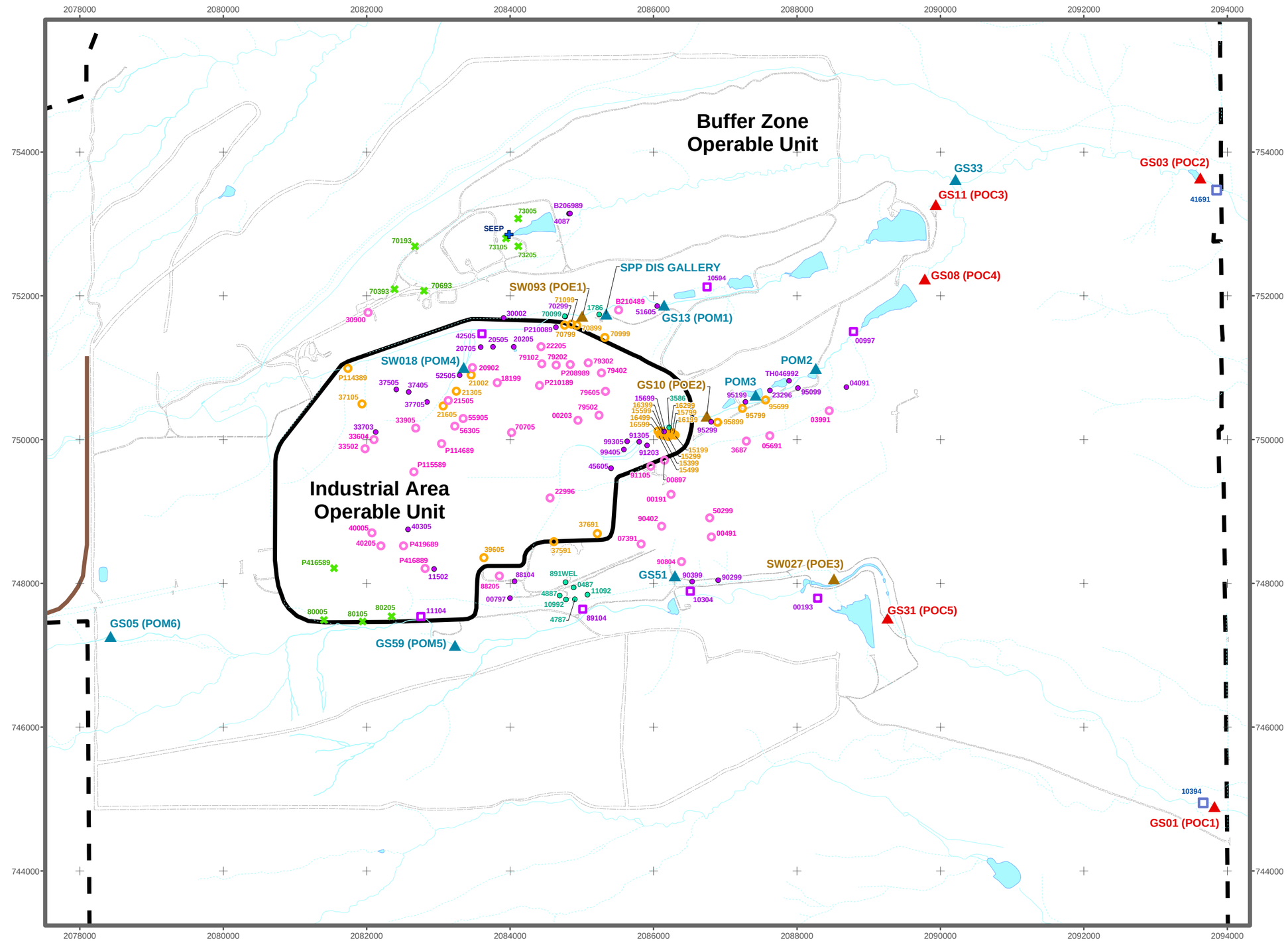

Figure 6

Rocky Flats Environmental Technology Site Groundwater and Surface Water Monitoring Locations FY05 IMP

Key

- AOC well
- Boundary well
- Sentinel well
- Decision Document well
- RCRA well
- Evaluation well
- Water Level well
- Surface water POM (Point of Measurement)
- Surface water POE (Point of Evaluation)
- Surface water POC (Point of Compliance)
- Seep

Note:
As of 8/1/05, some well installation/ replacements and surface water station removals have yet to be completed to reach the "final" network shown.

Source:
FY05, Rev. 1, Integrated Monitoring Plan, September 2005.

Standard Map Features

- Pond
- Site boundary
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Gravel road
- Dirt road

N
W E
S

0 1,400 2,800 Feet

Scale 1:16,800

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

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September 29, 2005

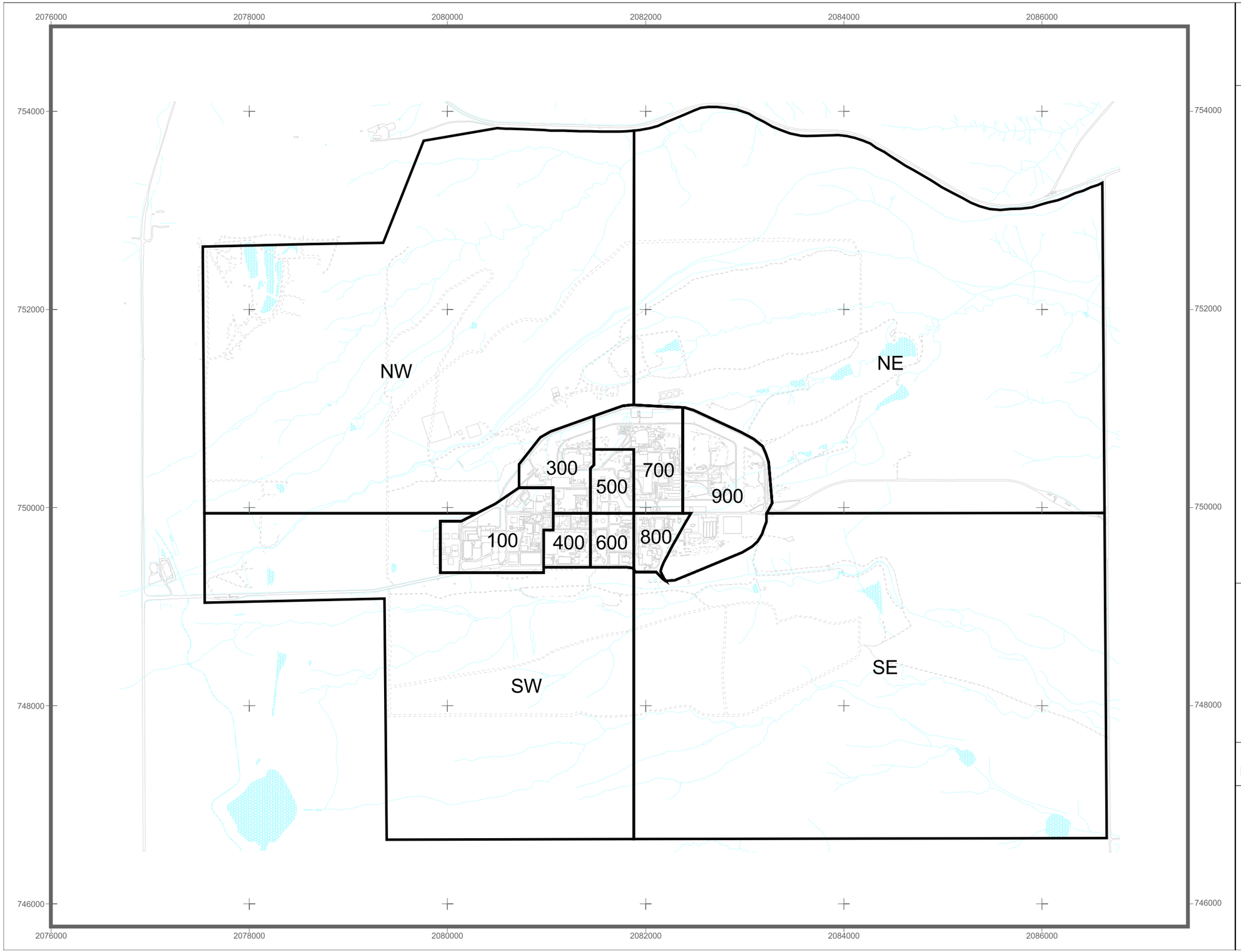

Figure 7
HRR Area Boundaries

KEY

- Area Boundary
- Asphalt
- Dirt Road
- Stream
- Lake
- Building

N
W E
S

1000 0 1000 2000 Feet

Scale = 1: 29500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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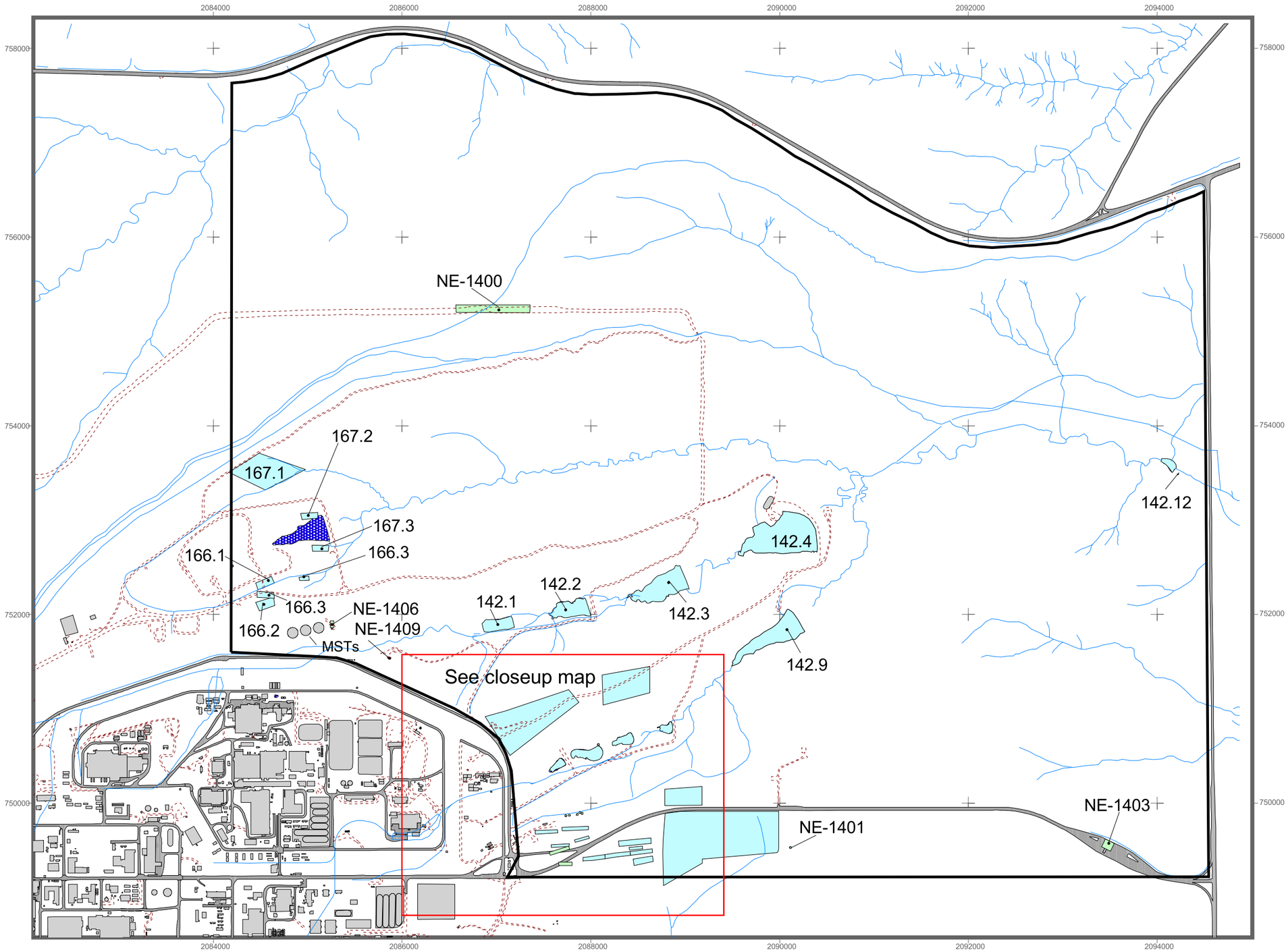

Figure 8
Northeast Buffer Zone Area
IHSSs and PACs

KEY

- Streams
- Dirt roads
- PAC
- IHSS
- HRR area
- Lakes
- Asphalt
- Building

N
W E
S

750 0 750 Feet

Scale = 1: 16500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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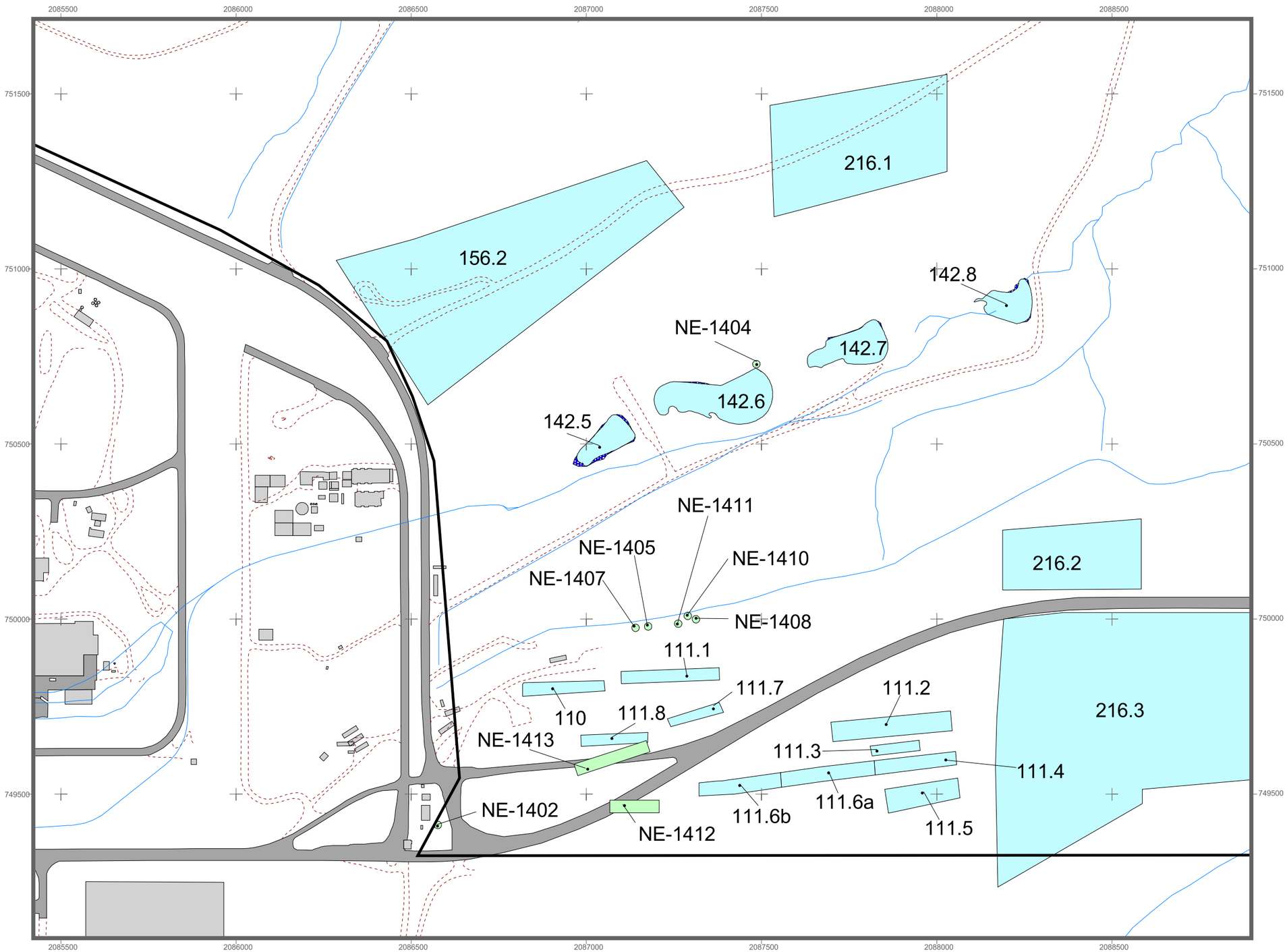

Figure 9
Northeast Buffer Zone Area
IHSSs and PACs Closeup View

KEY

- Streams
- Dirt roads
- PAC
- IHSS
- HRR area
- Lakes
- Asphalt
- Building

N
W E
S

250 0 250 Feet

Scale = 1: 5125

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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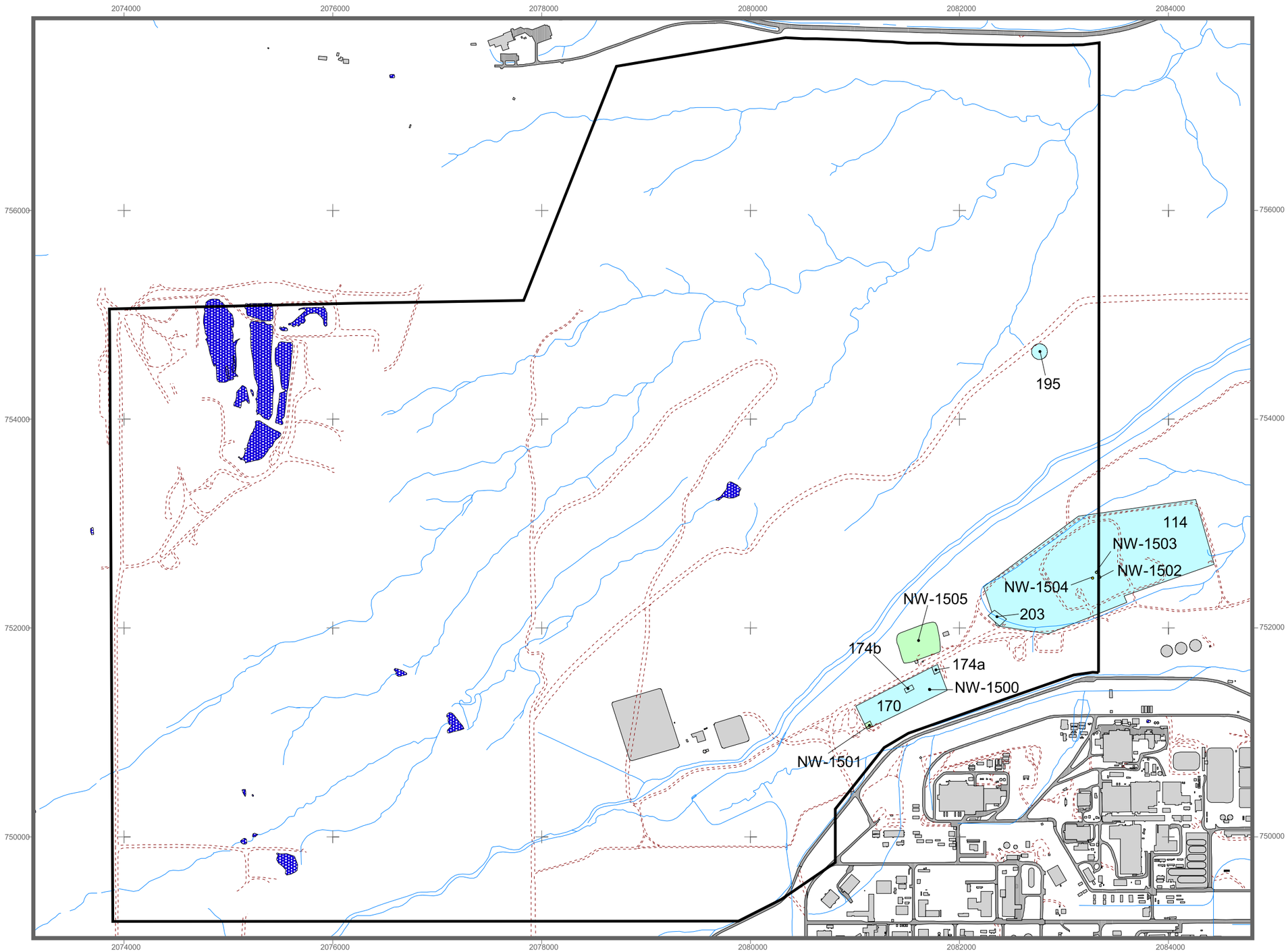

Figure 10
Northwest Buffer Zone Area
IHSSs and PACs

KEY

- Streams
- Dirt roads
- PAC
- IHSS
- HRR area
- Lakes
- Asphalt
- Building

N
W E
S

750 0 750 Feet

Scale = 1: 15150

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.27.05

File: W:\Projects\FY2005\HRR Update\Figures\
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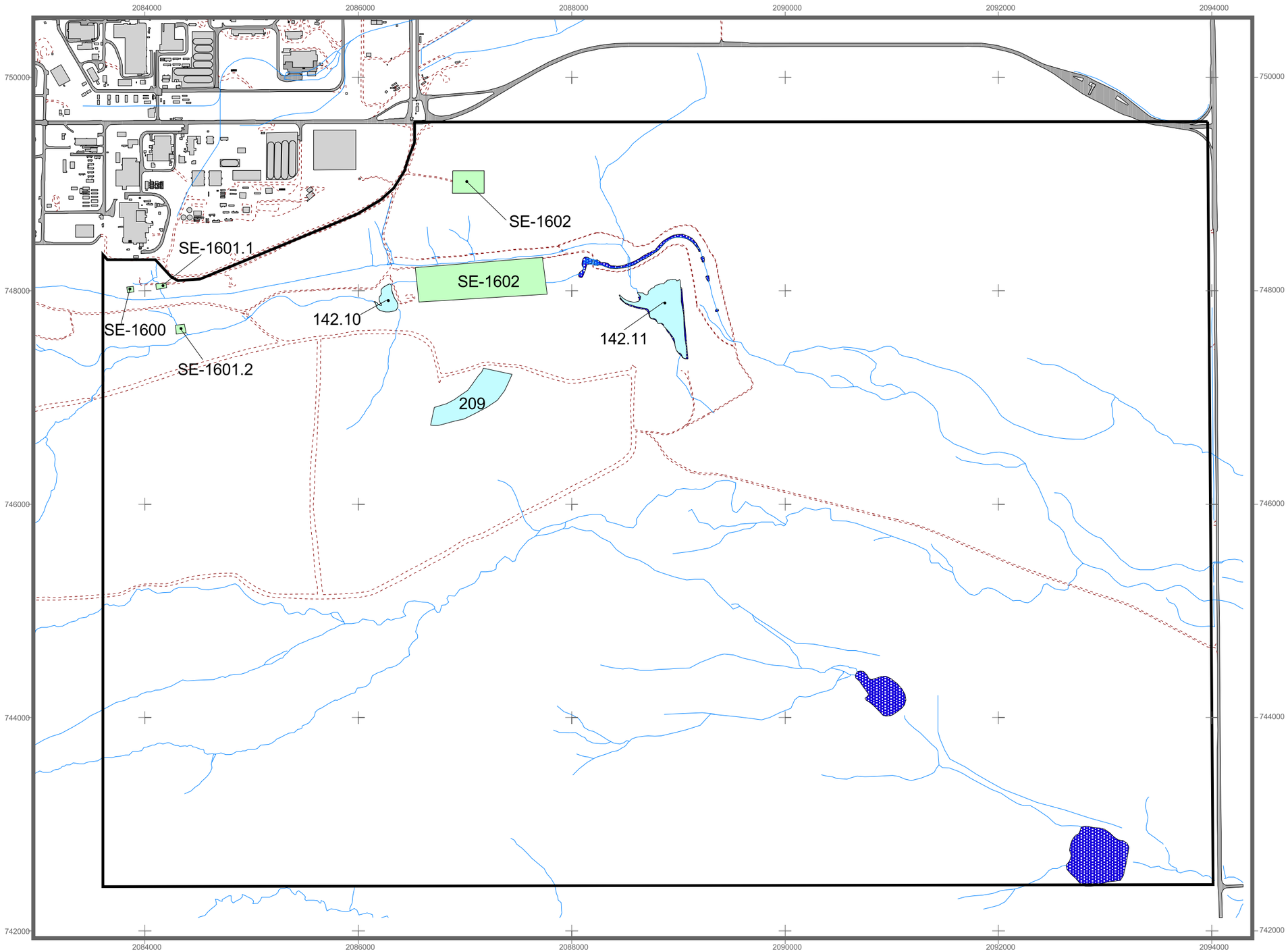

Figure 11
Southeast Buffer Zone Area
IHSSs and PACs

KEY

- Streams
- Dirt roads
- PAC
- IHSS
- HRR area
- Lakes
- Asphalt
- Building

N
W E
S

750 0 750 Feet

Scale = 1: 13825

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.27.05

File: W:\Projects\FY2005\HRR Update\Figures\
hrr_se_bz.apr

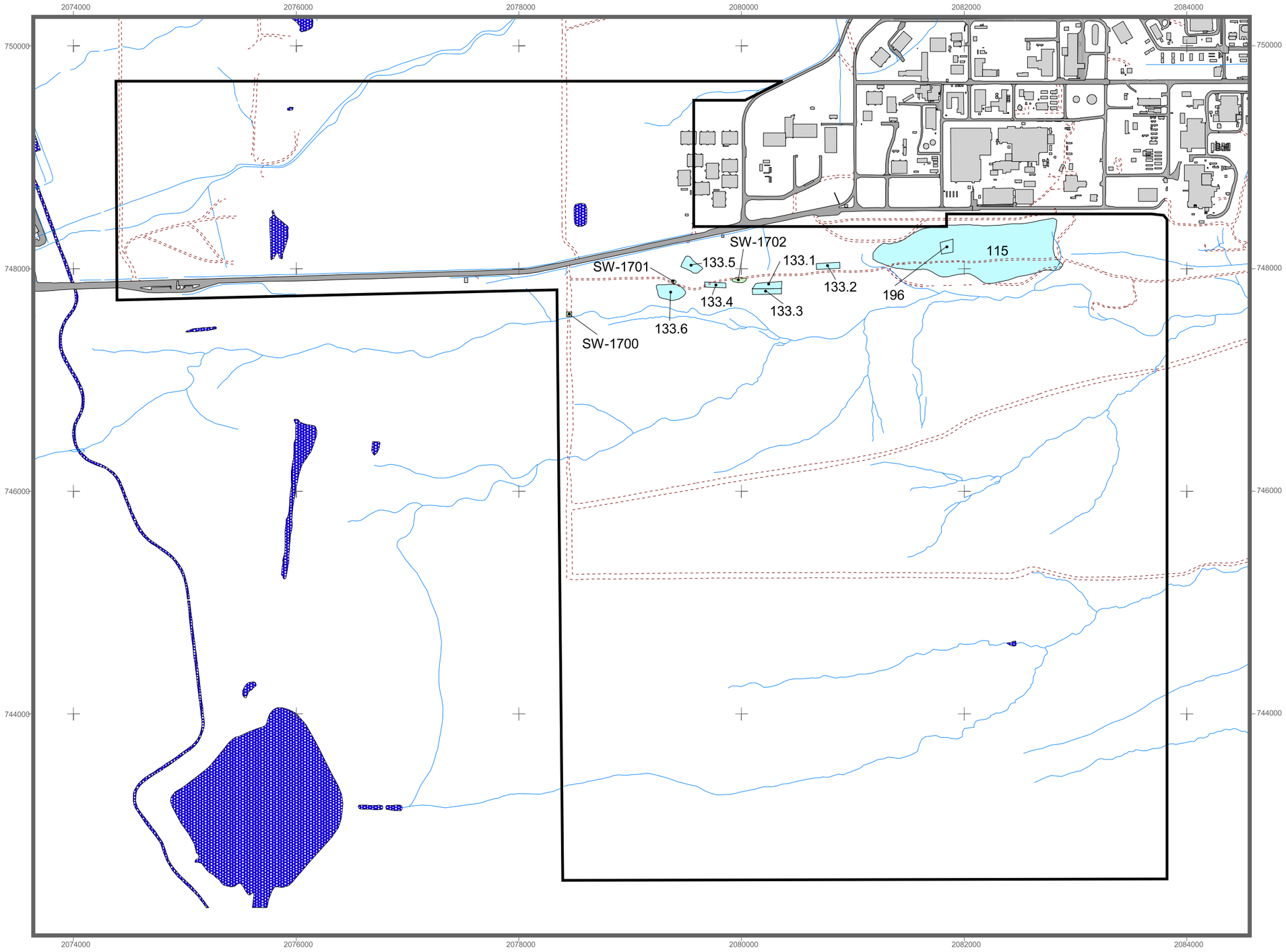

Figure 12
Southwest Buffer Zone Area
IHSSs and PACs

KEY

- Streams
- Dirt roads
- PAC
- IHSS
- HRR area
- Lakes
- Asphalt
- Building

N
W E
S

750 0 750 Feet

Scale = 1: 12850

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.27.05

File: W:\Projects\FY2005\HRR Update\Figures\hrr_sw_bz.apr

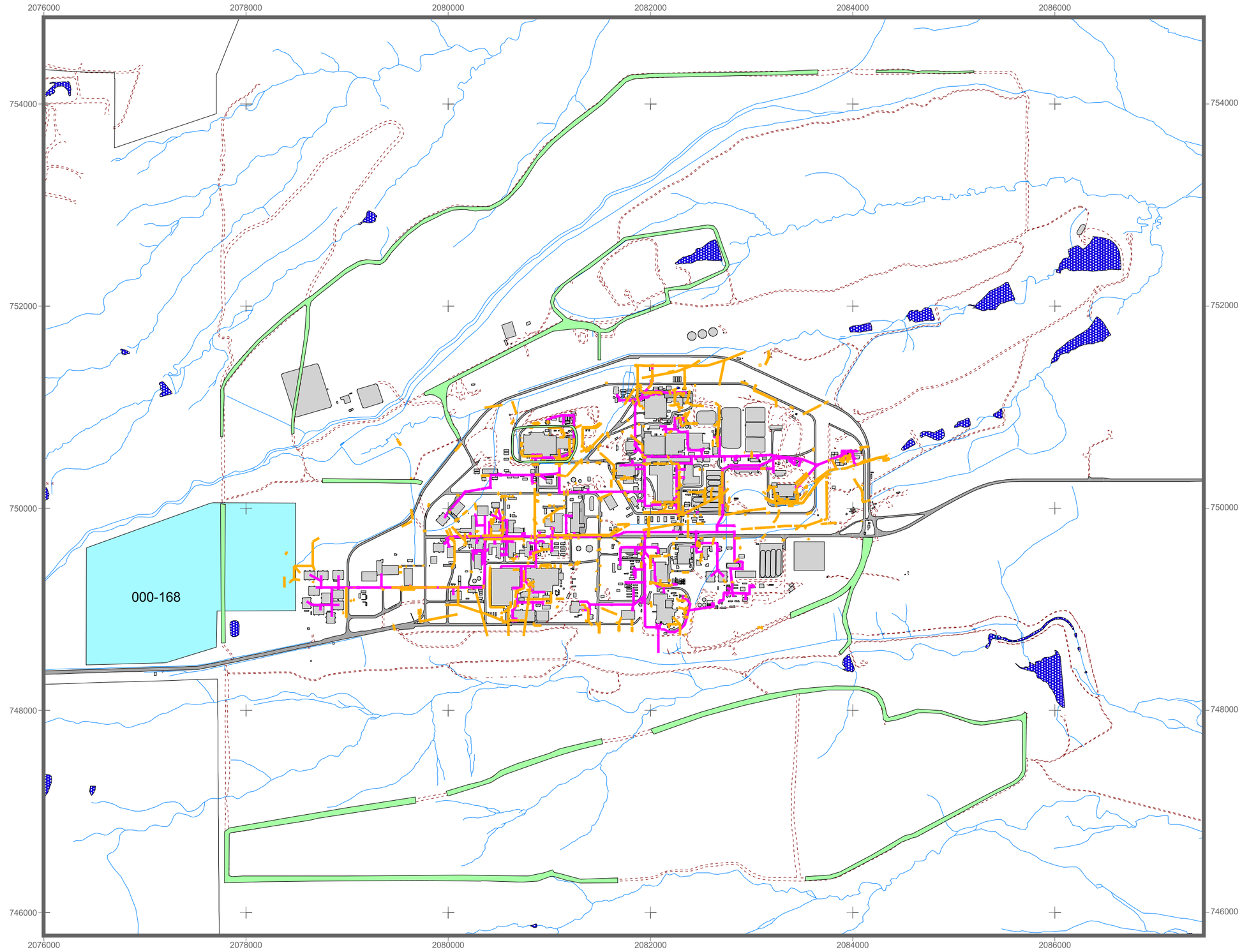

Figure 13
HRR 000 Area
Storm Drains and Sanitary Sewers

KEY

- Storm Drains (000-505)
- Sanitary Sewer (000-500)
- Stream
- Dirt road
- PAC 000-501
- IHSS
- Lake
- Asphalt
- Building
- Site Boundary

N
W E
S

1000 0 1000 Feet

Scale = 1: 18850

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\hrr_000.apr

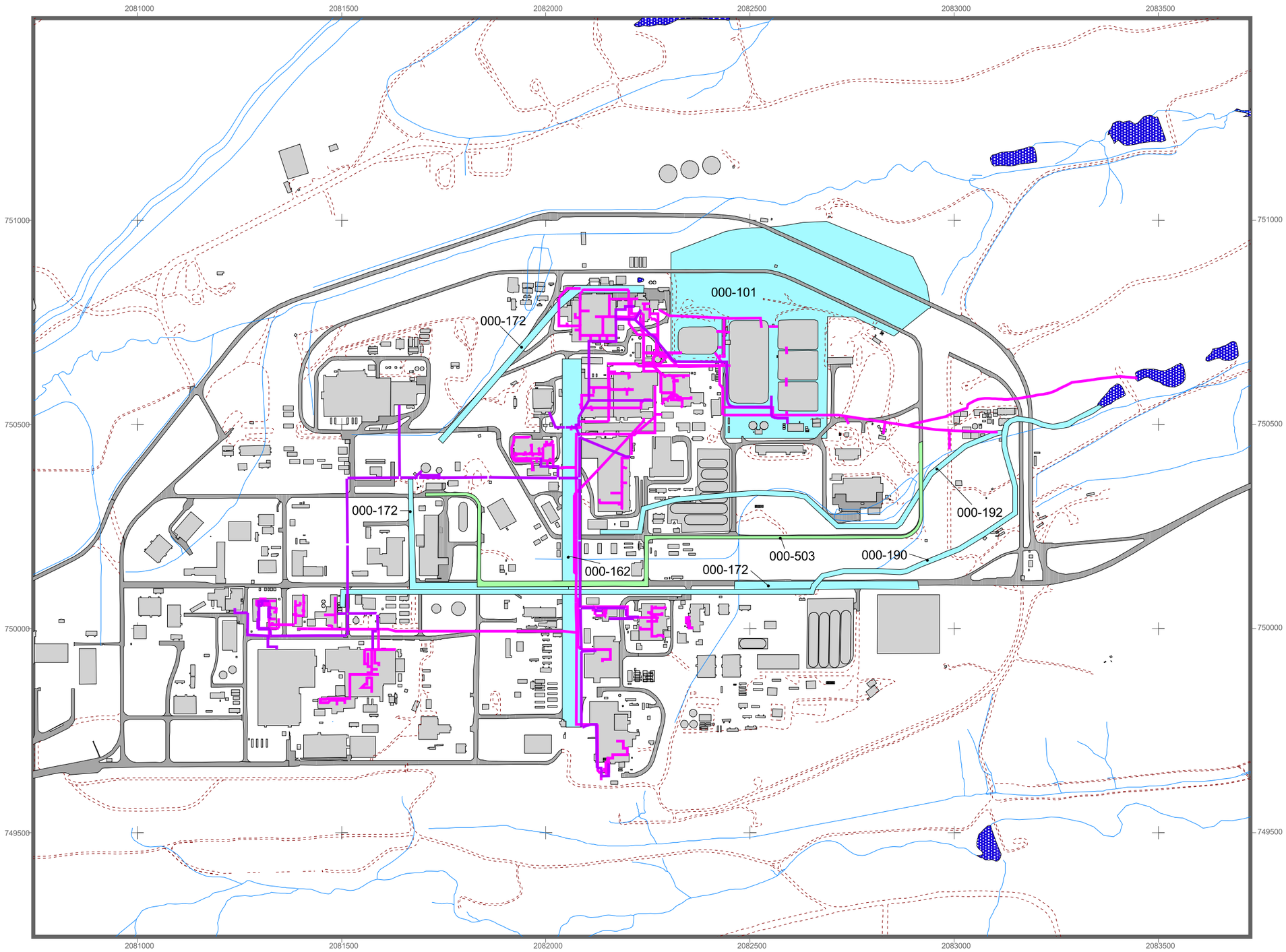

Figure 14
HRR 000 Area
OPWL, NPWL, IHSSs, and PACS

KEY

- Stream
- Dirt Road
- OPWL (000-121)
- NPWL (000-504)
- PAC
- IHSS
- Lake
- Asphalt
- Building

N
W E
S

500 0 500 Feet

Scale = 1: 6200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\hrr_000.apr

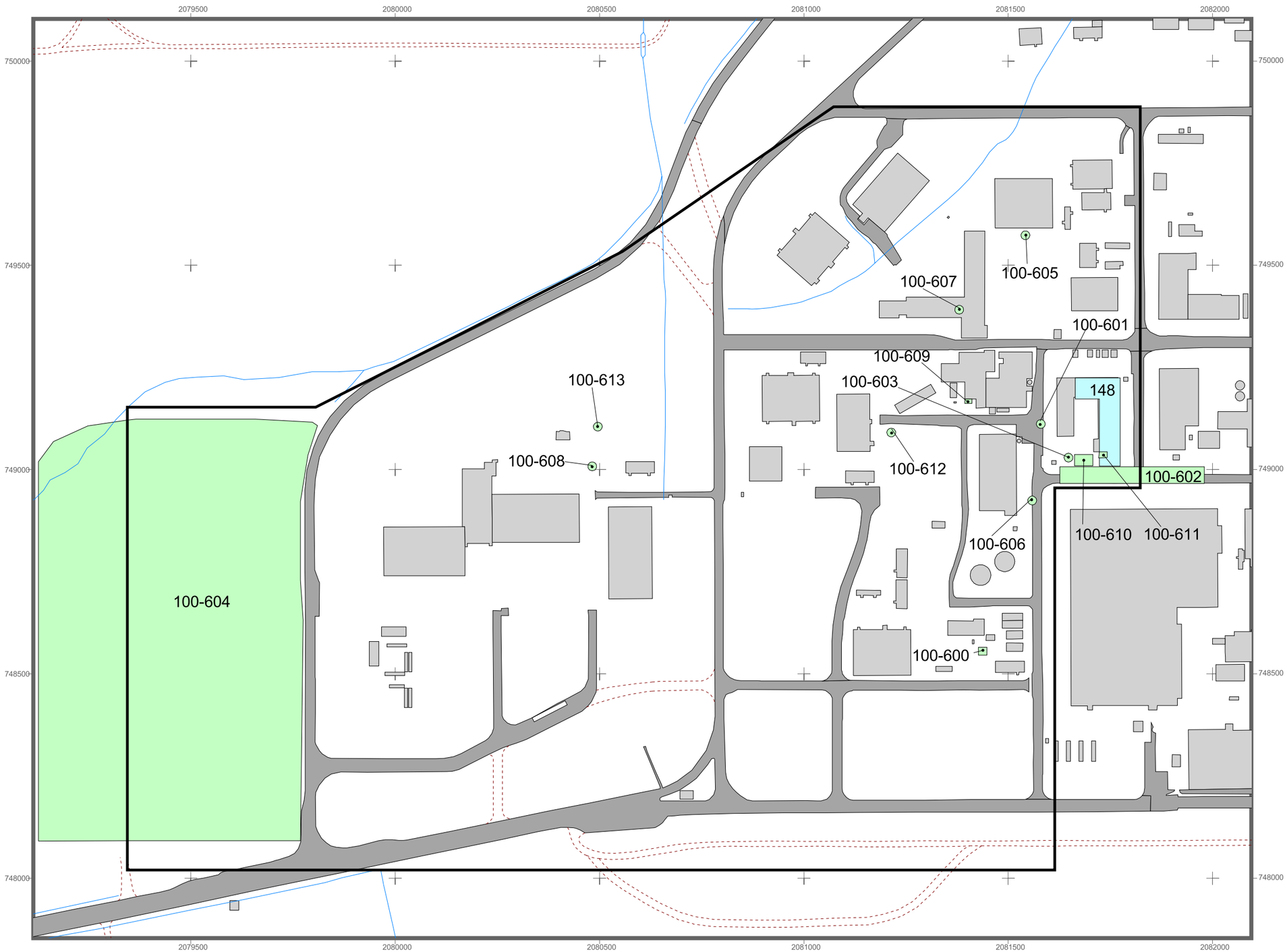

Figure 15
HRR 100 Area
IHSSs and PACs

KEY

- Stream
- Dirt road
- PAC
- IHSS
- HRR area
- Lake
- Asphalt
- Building

N
W E
S

200 0 200 Feet

Scale = 1: 3600

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\hrr_100.apr

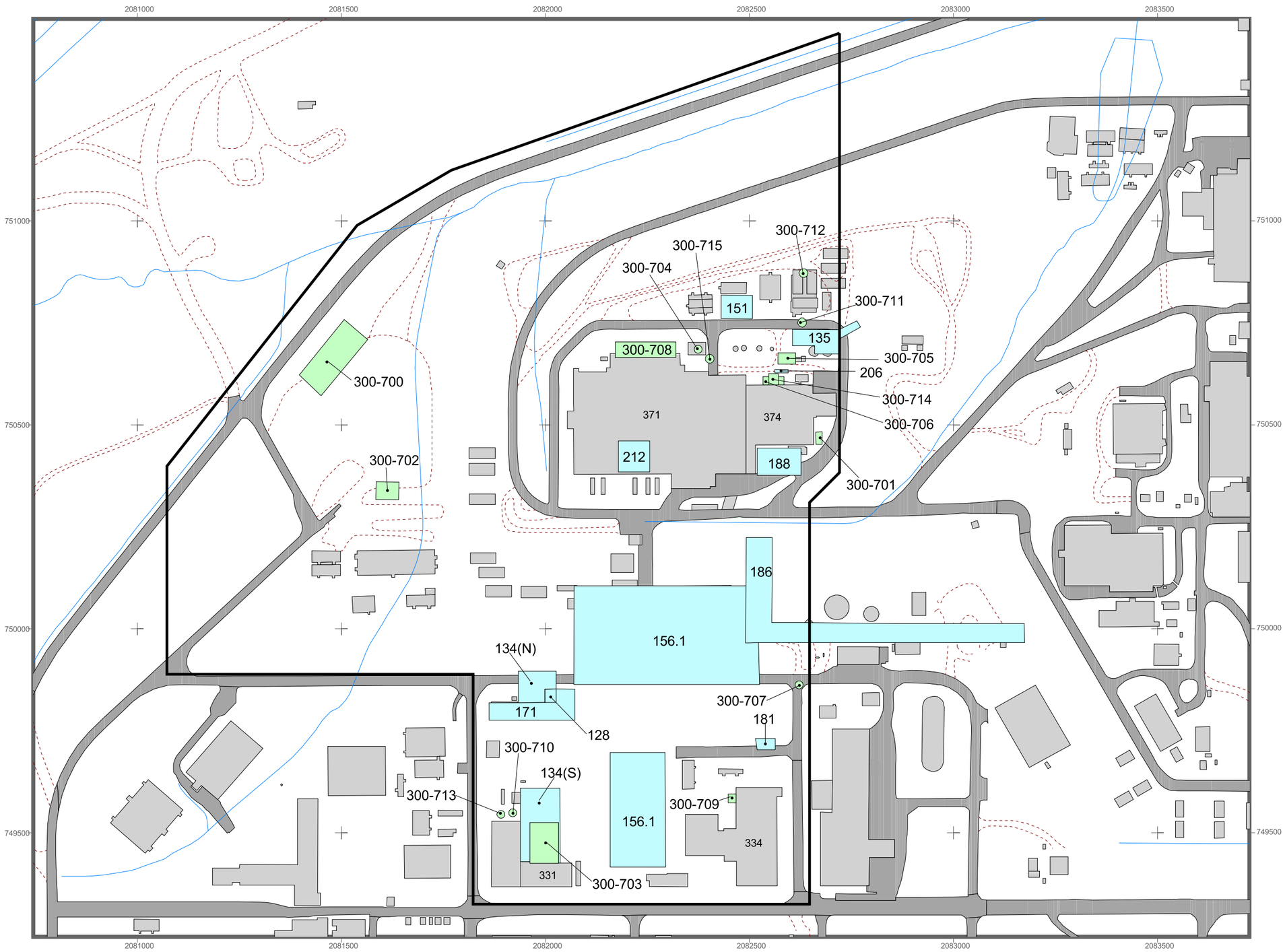

Figure 16
HRR 300 Area
IHSSs and PACs

KEY

- Stream
- Dirt road
- PAC
- IHSS
- HRR area
- Lake
- Asphalt
- Building

N
W E
S

200 0 200 Feet

Scale = 1: 3600

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\
hrr_300.apr

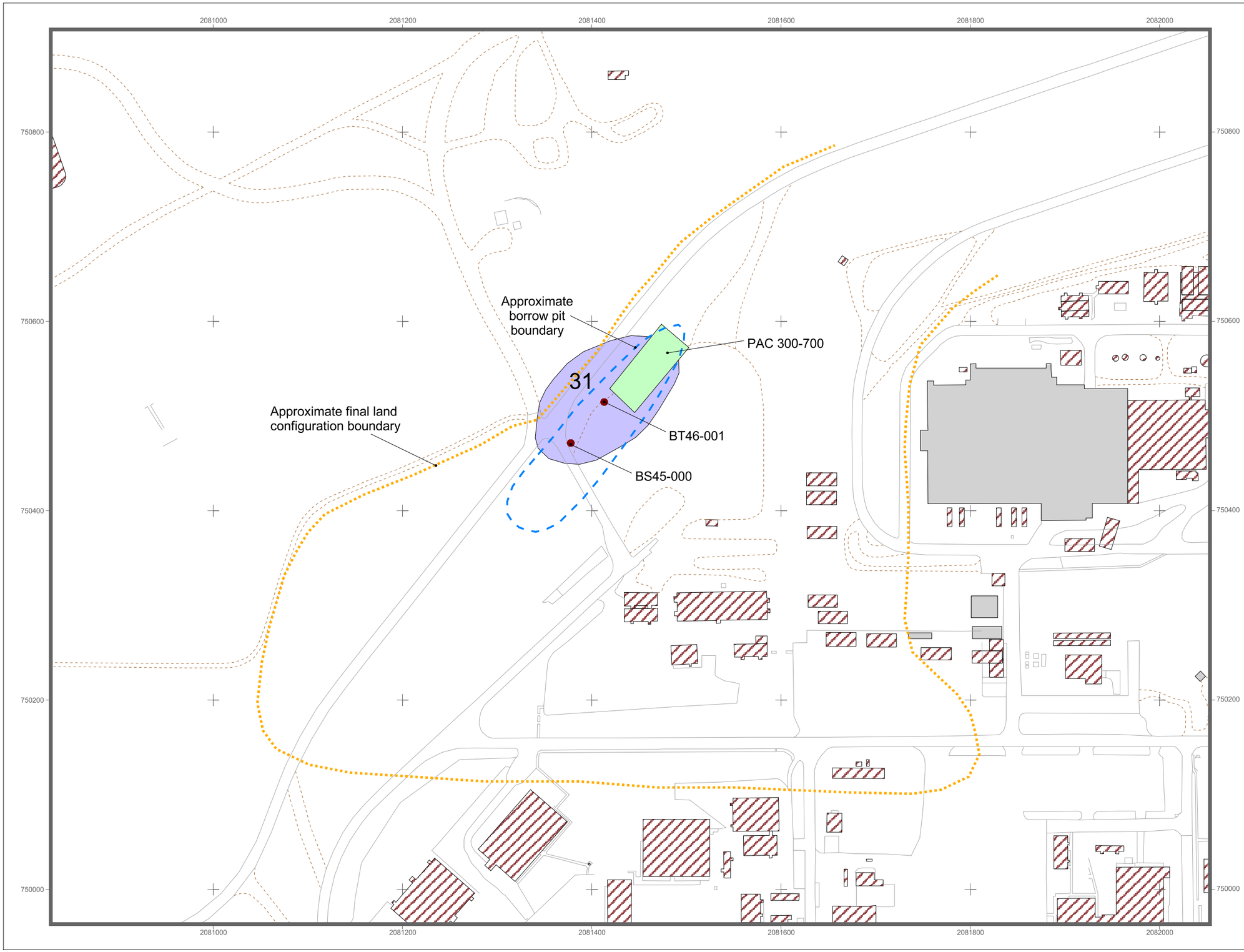

Figure 17
PAC 300-700

KEY

- Sample location
- Approximate borrow pit boundary
- Approximate final land configuration boundary
- Paved road
- Dirt road
- Buffer Zone Site
- Standing building
- Demolished building

N
W E
S

0 100 200 Feet

Scale = 1: 2,400

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.29.05

File: W:\Projects\Fy2005\hrr_update\figure\hrr_fig_17.apr

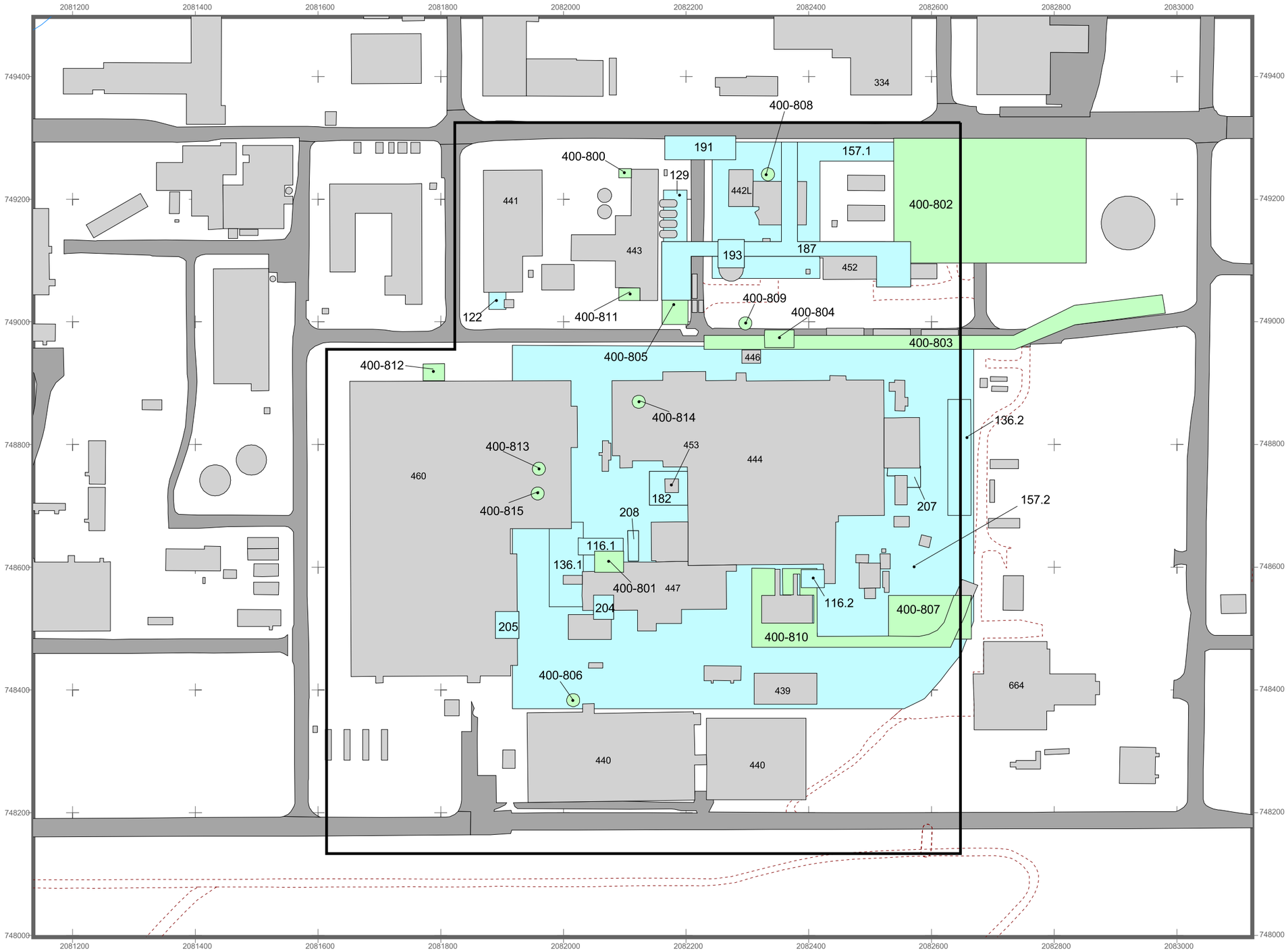

Figure 18
HRR 400 Area
IHSSs and PACs

KEY

- Stream
- Dirt road
- PAC
- IHSS
- HRR area
- Lake
- Asphalt
- Building

N
W E
S

150 0 150 Feet

Scale = 1: 2100

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\
hrr_400.apr

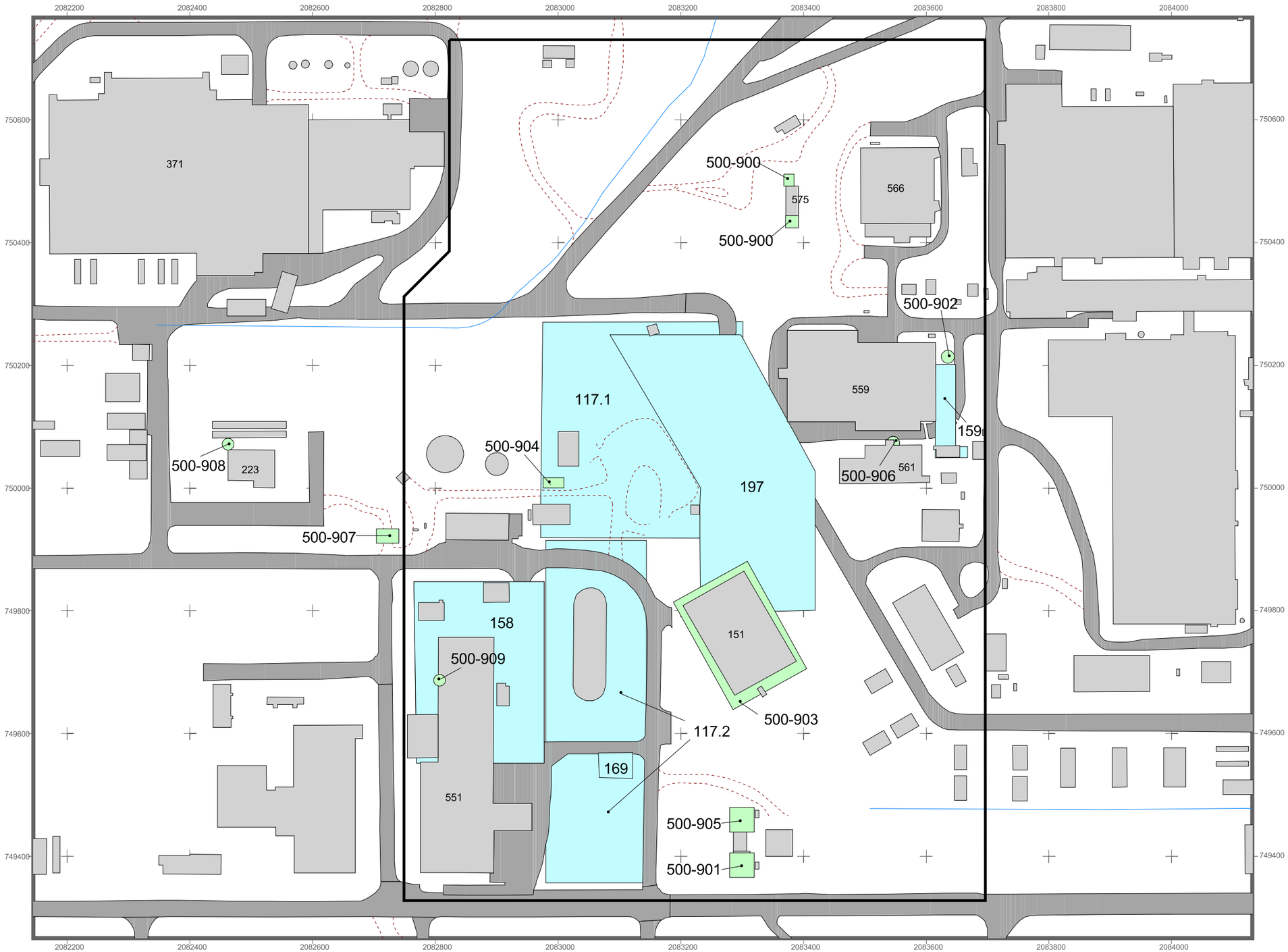

Figure 19
HRR 500 Area
IHSSs and PACs

KEY

- Stream
- Dirt road
- PAC
- IHSS
- HRR area
- Lake
- Asphalt
- Building

N
W E
S

100 0 100 200 Feet

Scale = 1: 2350

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\
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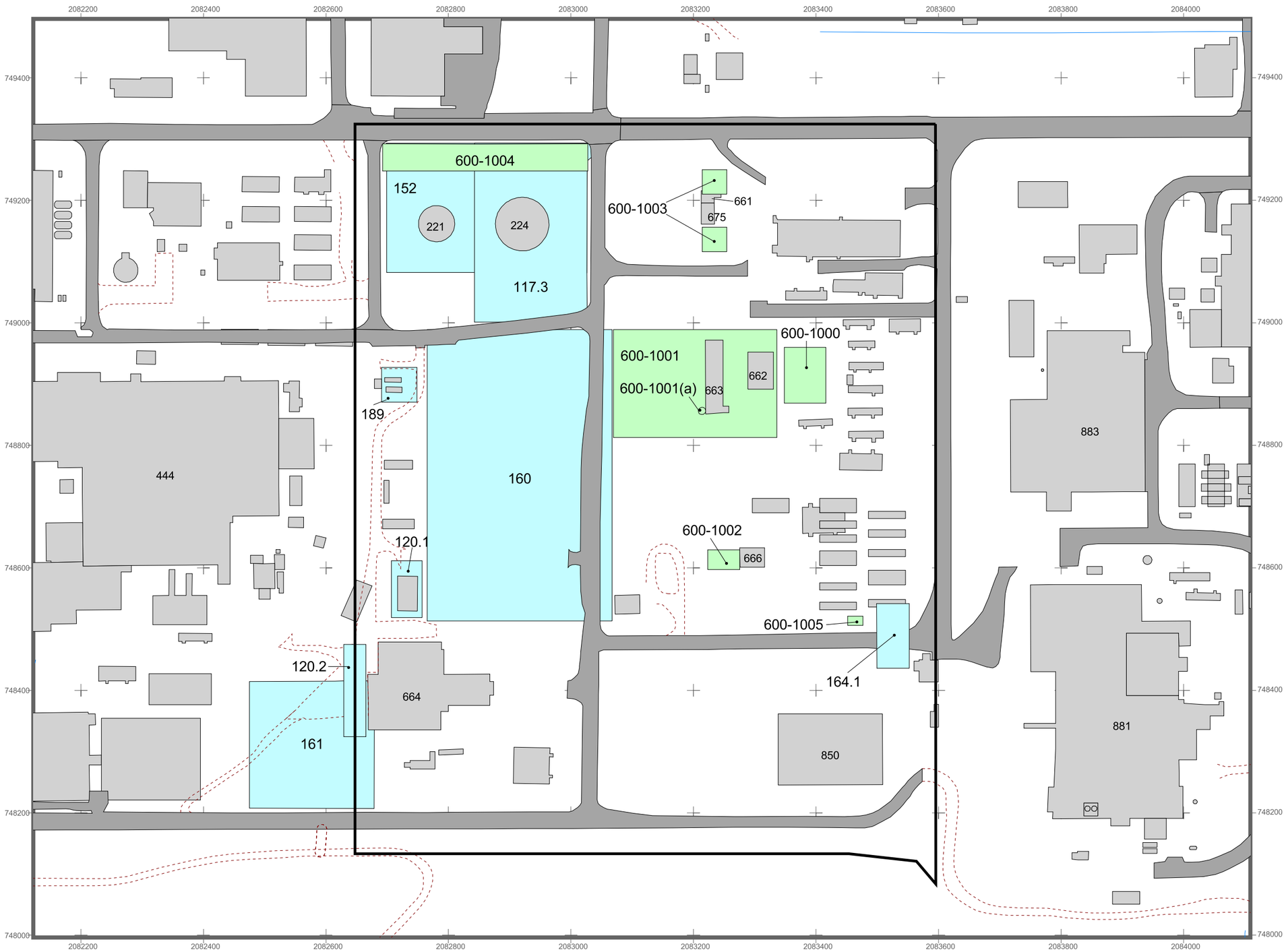

Figure 20
HRR 600 Area
IHSSs and PACs

KEY

- Stream
- Dirt road
- PAC
- IHSS
- HRR area
- Lake
- Asphalt
- Building

N
W E
S

150 0 150 Feet

Scale = 1: 2500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\
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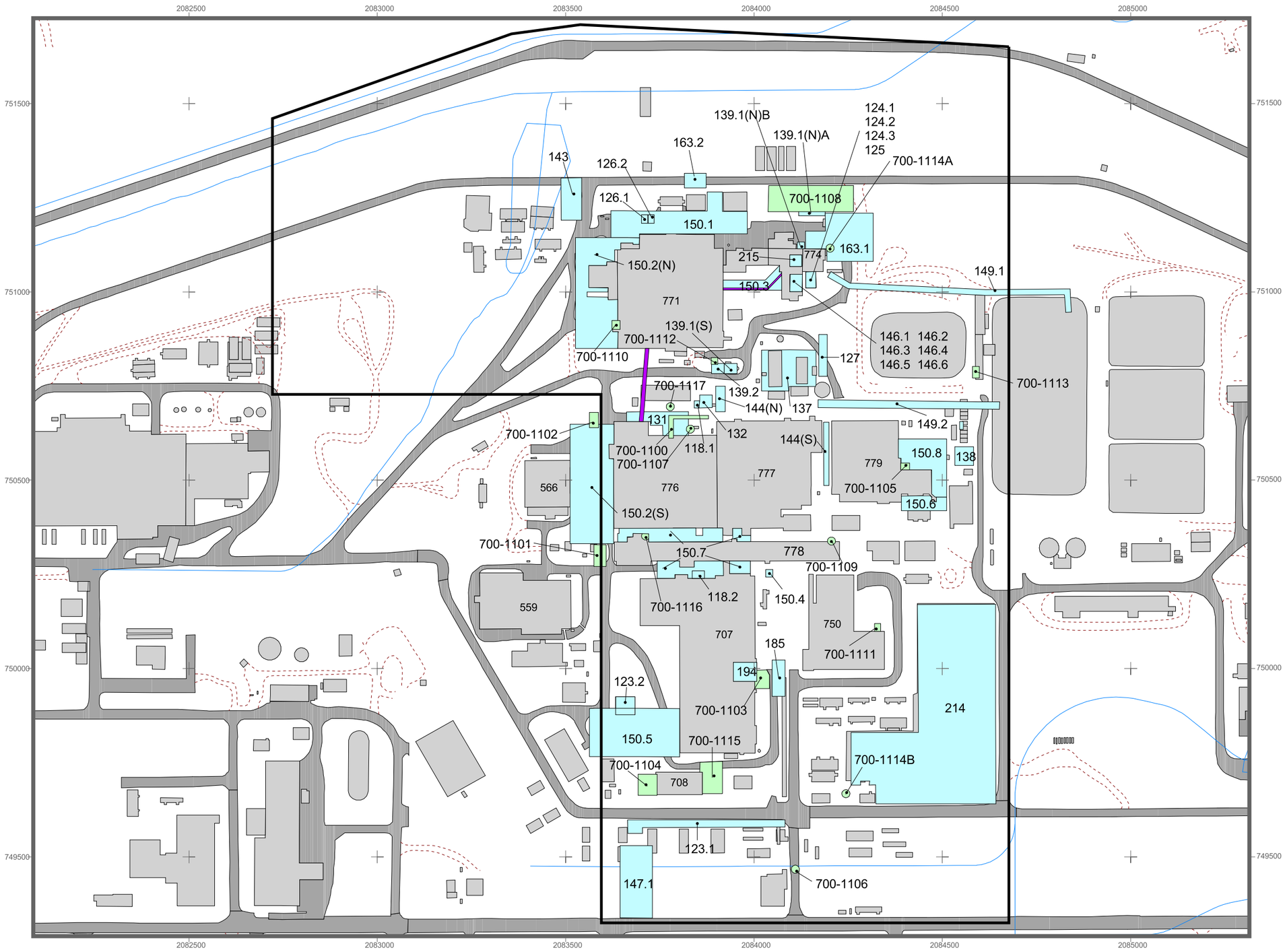

Figure 21
HRR 700 Area
IHSSs and PACs

KEY

- Stream
- Dirt road
- PAC
- IHSS
- HRR area
- Lake
- Asphalt
- Building
- Tunnel

N
W E
S

250 0 250 Feet

Scale = 1: 4000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\
hrr_700.apr

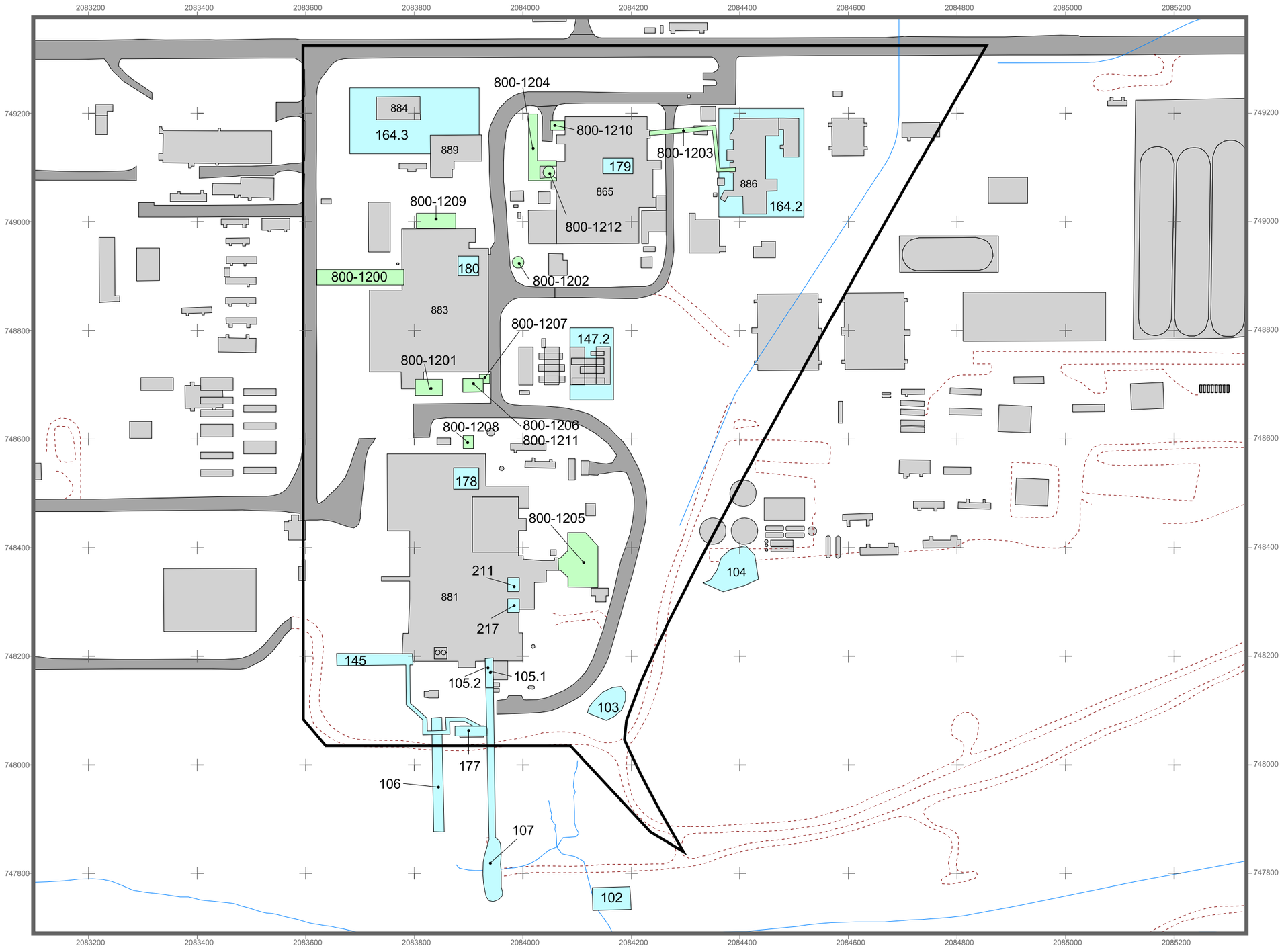

Figure 22
HRR 800 Area
IHSSs and PACs

KEY

- Stream
- Dirt road
- PAC
- IHSS
- HRR area
- Lake
- Asphalt
- Building

N
W E
S

150 0 150 Feet

Scale = 1: 2650

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\
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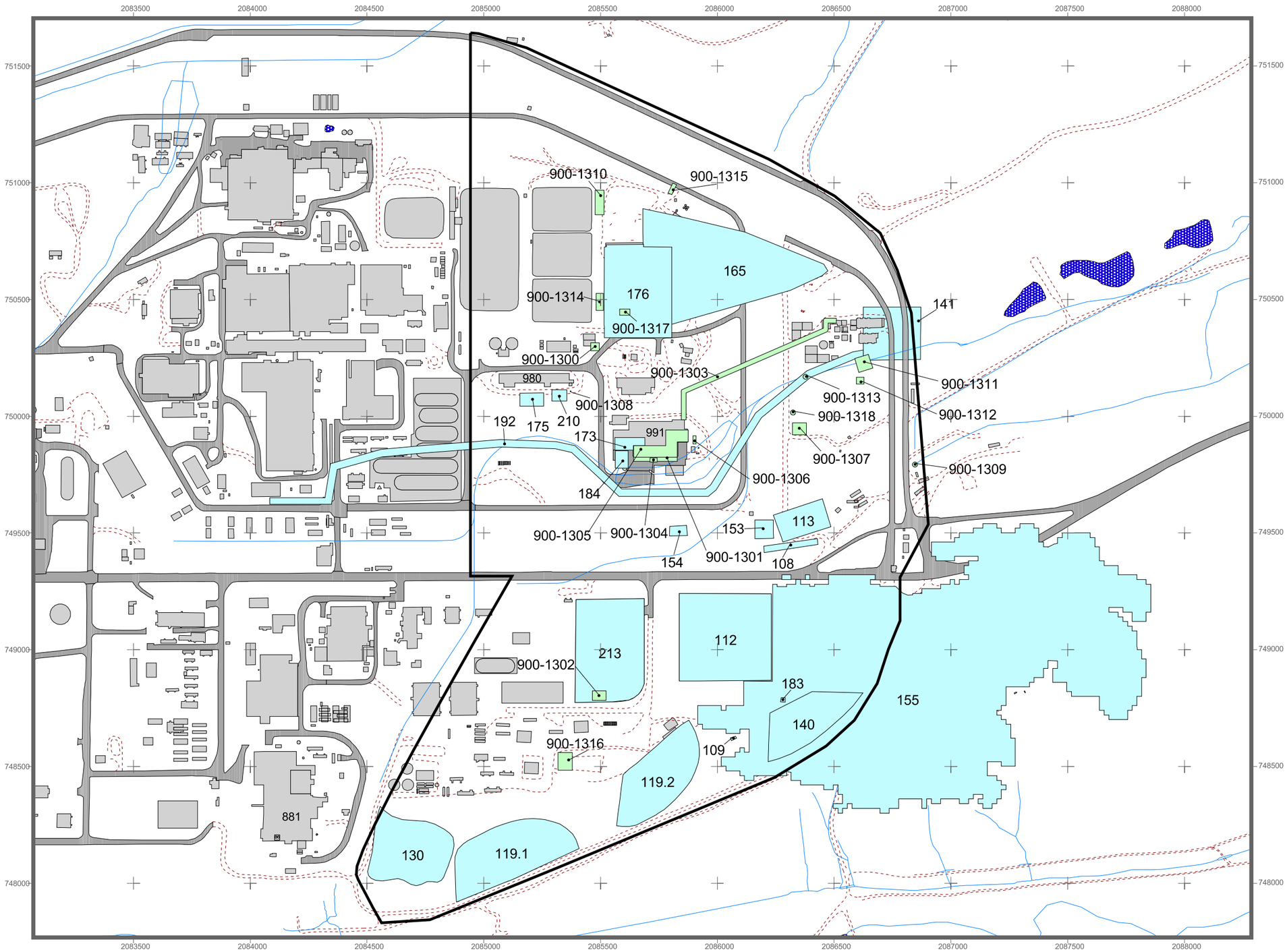

Figure 23
HRR 900 Area
IHSSs and PACs

KEY

- Streams
- Dirt roads
- PAC
- IHSS
- HRR area
- Lakes
- Asphalt
- Building

N
W E
S

300 0 300 Feet

Scale = 1: 6800

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 09.28.05

File: W:\Projects\FY2005\HRR Update\Figures\
hrr_900.apr

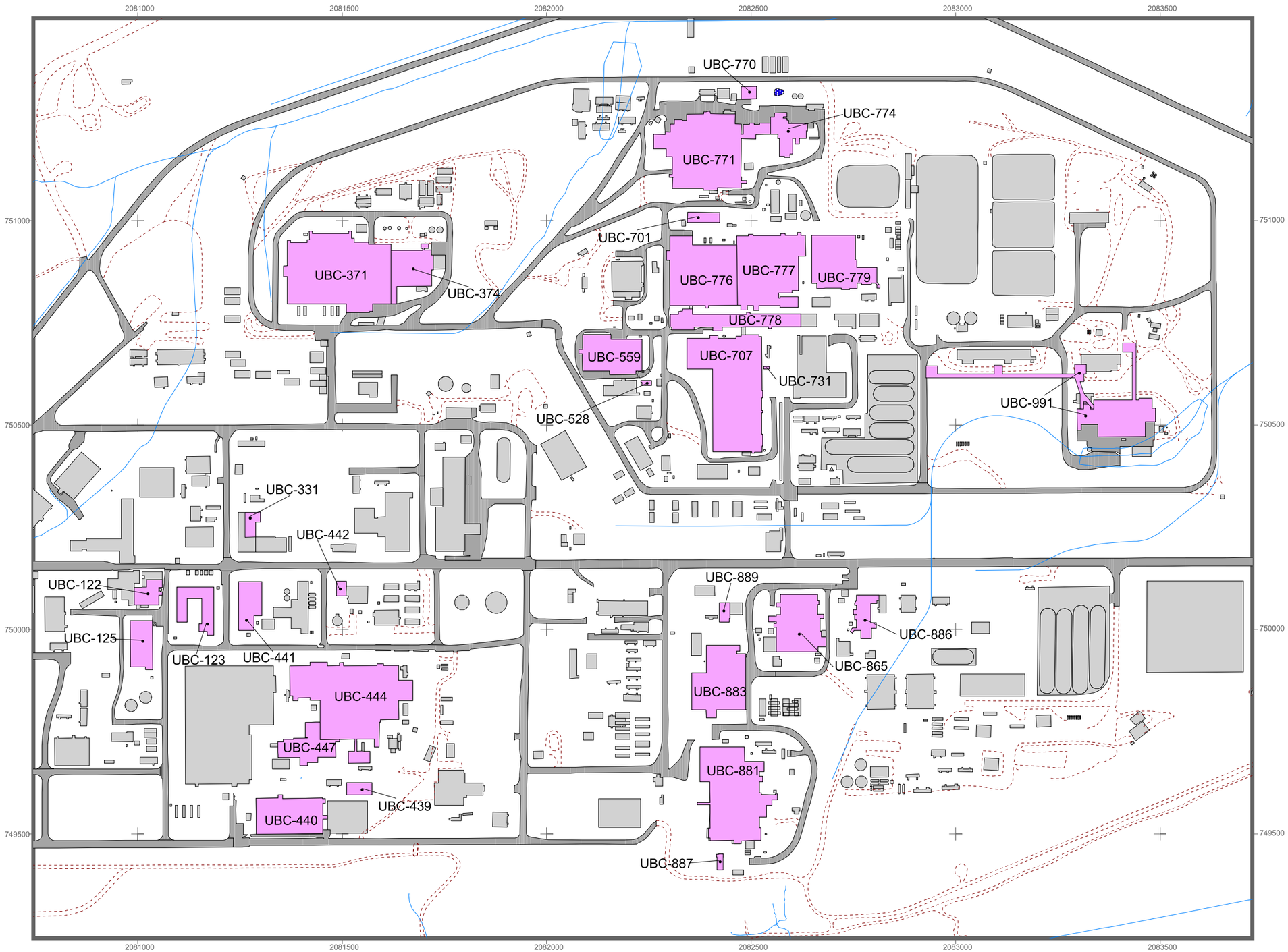

Figure 24
HRR UBCs

KEY

- Stream
- Dirt road
- UBC
- Lake
- Asphalt
- Building

N
W E
S

400 0 400 Feet

Scale = 1: 6000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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Date: 09.28.05

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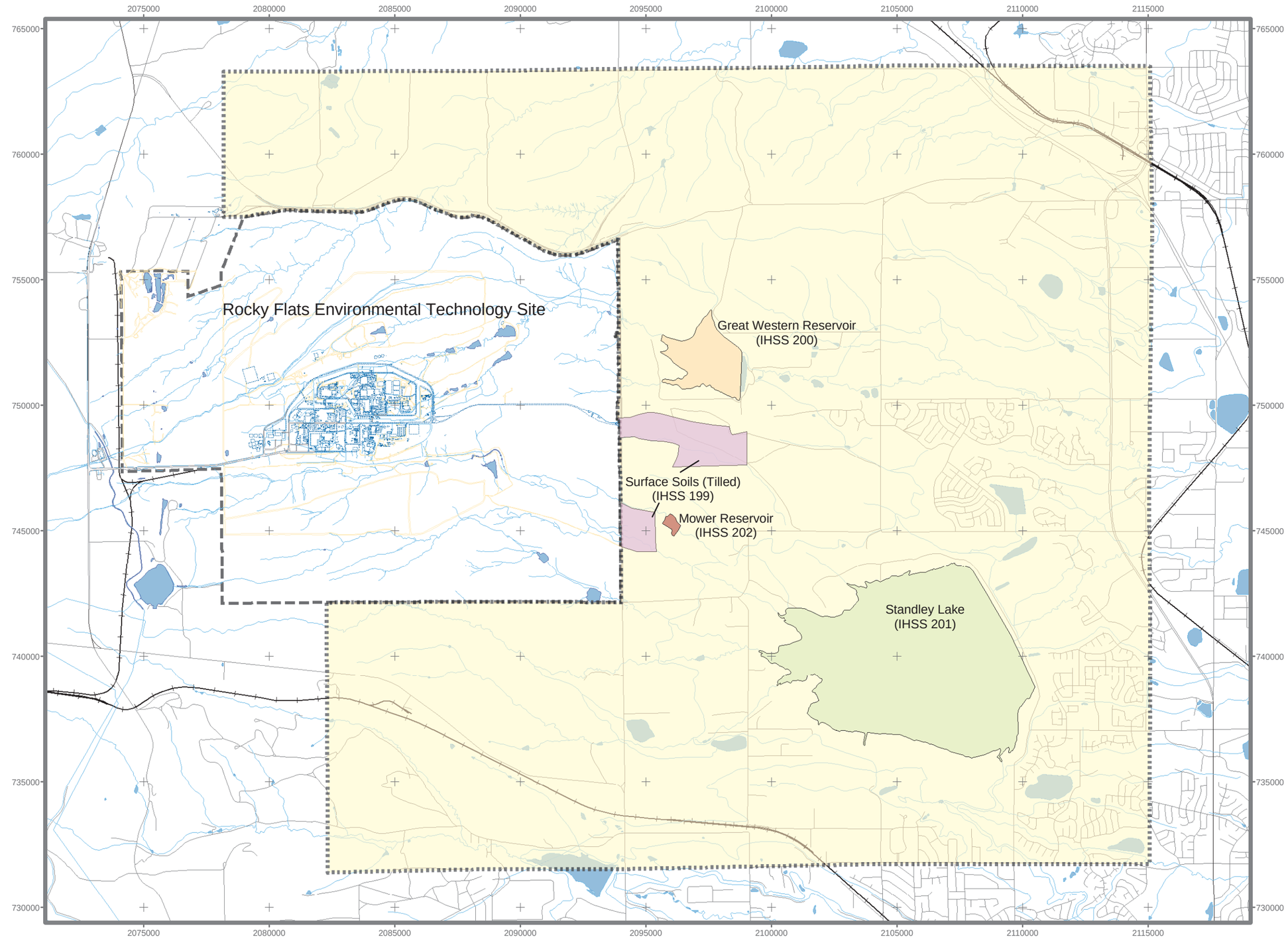

Figure 25

Operable Unit 3 Location Map

Key

- Road
- Major Road
- Rail Road
- Stream
- Site Boundary
- Lake
- Demolished Structure
- OU3 Study Area
- IHSS 199 (Tilled Area)
- IHSS 200
- IHSS 201
- IHSS 202

N
W E
S

0 2,400 4,800 Feet

Scale 1:48,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Date: 10.05.2005

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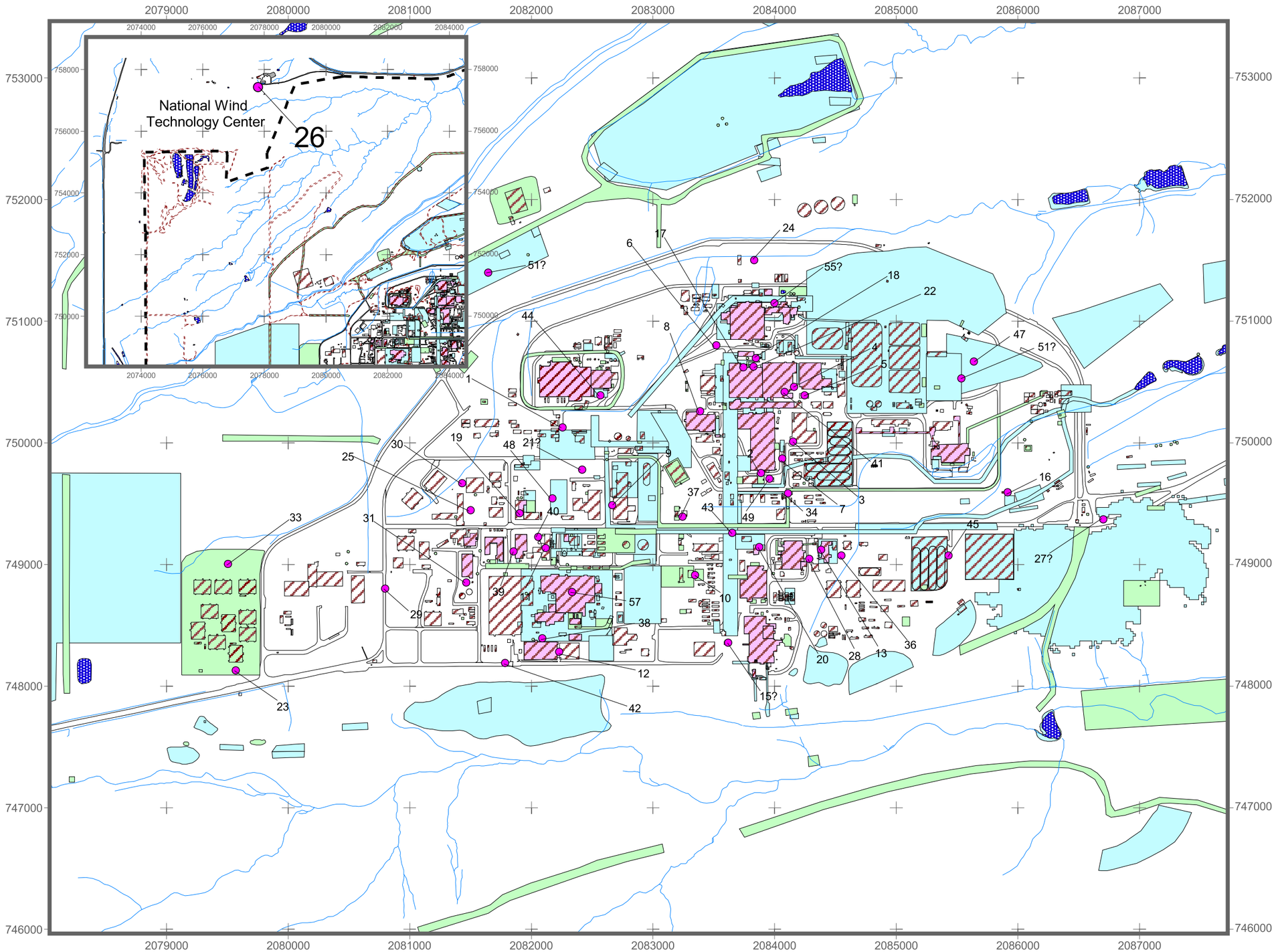

Figure 26
Rocky Flats Environmental Technology SIte
PIC Locations

KEY

- Approximate PIC location
- ? Assumed location using available information
- Stream
- Pond
- Demolished building or removed structure
- IHSS
- UBC
- PAC

(Inset Shows Location 26)

Insufficient Information Exists to Identify Location for Following PICs

14
32
35
46
50 (may coincide with NPWL/OPWL)
51 may have been PU&D Yard (IHSS 170) or S&W Yard (IHSS 165)
52
53
54
56 Rio Grande Motorways leak (occurred offsite)
58
59
60
61

N
W E
S

150 0 150 Feet

Scale = 1: 2100

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Rocky Flats Environmental Technology Site

Date: 09.28.05

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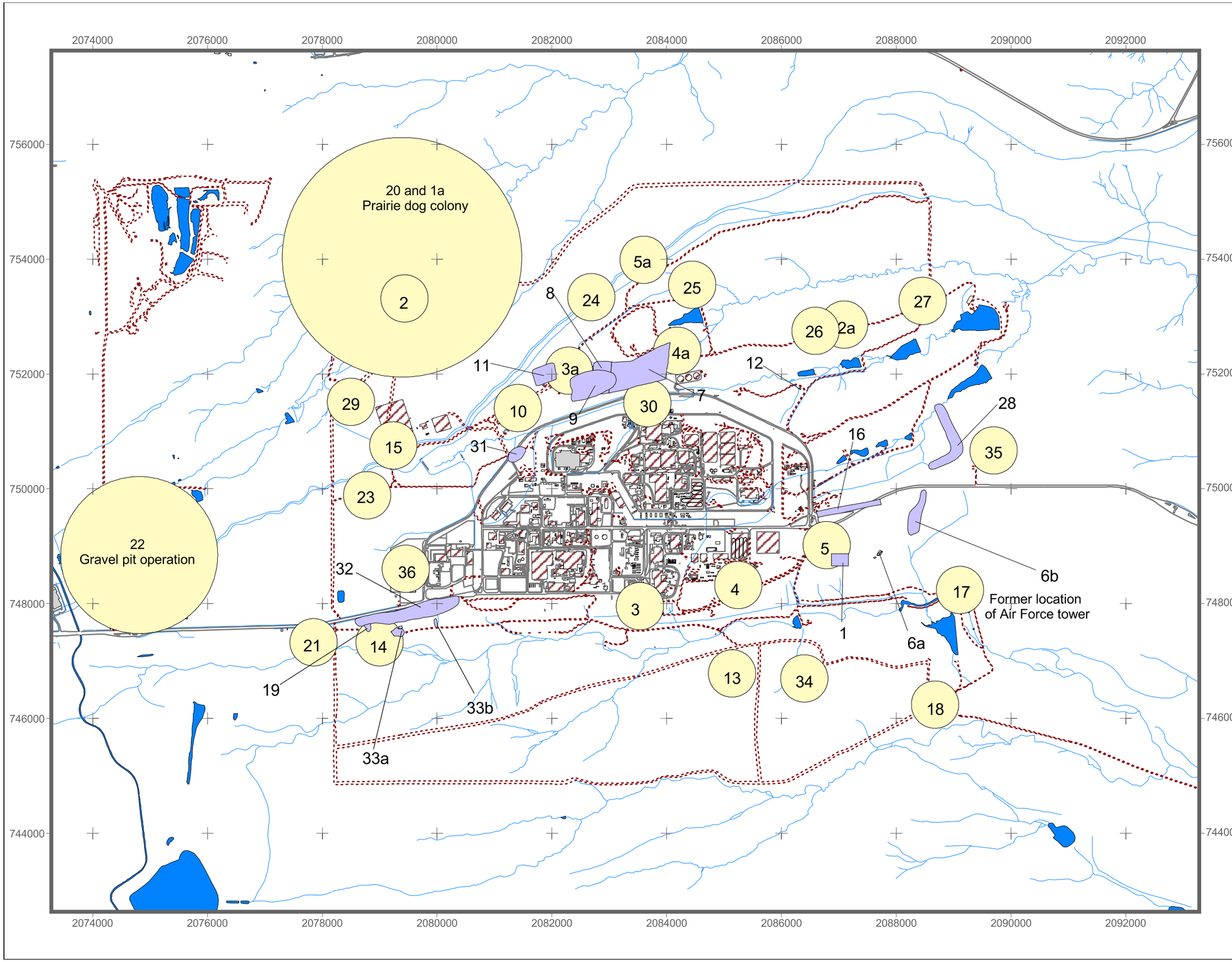

Figure 27
Buffer Zone Contamination Report Site Locations

KEY

- 3 — Agreed to BZ Contamination Report Site Approximate Boundary
- Sites Sampled
- Paved road
- Dirt road
- Stream
- Pond
- Demolished building
- Standing building

N W E S

1000 0 1000 Feet

Scale = 1: 20,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Date: 09.28.05

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